MINDFUL LEARNING:

RESEARCH ON LEARNER AWARENESS, METACOGNITION, AND LEARNING STRATEGIES

VOICES FROM THE FIELD

RESEARCH FROM THE SPECIALIST PROGRAM IN BILINGUAL EDUCATION

ÚNICA
INSTITUCIÓN UNIVERSITARIA COLOMBO AMERICANA

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Josephine Taylor
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PRESENTATION

MARIA LUCIA CASAS

Rectora, Institución Universitaria Colombo Americana – ÚNICA

When I was asked to write these words, that is early this year, what first came to my mind was how relevant the topics addressed in this book were for the times in which we were living. At that moment, I had never heard a word about COVID 19. The only references I had to pandemics were what I learned at school about the Black Death in Europe in the Middle Ages, and the Spanish Flu, which struck early in the twentieth century, but those things were history. I thought that they happened because of humans' lack of education, science or research. I was happy to think that the human race would never face such catastrophic events again.

Now, because of COVID 19, we will be part of what future generations learn about in their history lessons. I would not dare to say that we have not evolved in terms of education, scientific development or quantity, quality and scope of research. We have, but clearly this has not been enough to prevent this epidemic from arising and affecting the entire planet. It is taking scientists and labs around the globe thousands of hours of hard work to find a vaccine and a cure, and we are not still there. It is still unclear how we will manage to live with what is happening, or how we will survive the confinement and fear, and prepare for uncertainty which is what seems to be the only predictable thing in the future.

I do think we must go back to what is fundamental, namely education, not only in terms of what can be done through educational and instructional processes, but what can be learned and implemented through research in education. This brings me to the valuable and relevant the articles presented in this book, *Mindful Learning: Learner Awareness, Metacognition, and Learning Strategies*. These are the tools that we can provide our children, young adults and people of all ages in order to be able to face this time of uncertainty where health, indeed survival, depend on our capacity to make sound choices, be aware, and work with determination towards growth, well-being, and also towards the acquisition and development of the intellectual and emotional skills and competences that will be necessary to go back to a completely different life than the one we had prior to COVID.

When do go out once again, meet with others, learn or work collaboratively at school or work, we will be required even more to be mindful, creative, self-regulated, and to assume ownership of our learning processes and our development as human beings and members of a community. We will need to bear the responsibility of the search for a greater good and the well-being of our planet. As learners and also as teachers, we will need to be skillful in the use of technologies and capable of embracing metacognitive thinking in order to enhance our potential and prepare for a reality full of challenges that will require our full commitment to design a better and safer world.

I am truly proud to think that this book, which is the result of the leadership and vision of Josephine Taylor and the research conducted by the students of ÚNICA´s Specialisation Program in Bilingual Education, is living proof that education, what we learn from it, and what we can conquer from systematic, rigorous and thorough research in the classroom, are an answer to what humankind needs now and will need in the future, no matter how challenging it might be or how unpredictable it might look.

FOREWARD

MAURICIO ALDANA

LESSON 101: KNOW THYSELF

One of Socrates' dictums is Gnothi Seauton: Know Thyself. That's it. It sounds simple, maybe too simple. But then, one day, all of a sudden, we decide to actually think it over and our encounter with its freshness and aliveness shocks us, and we finally understand why that simple statement is considered to be wisdom. And we feel indebted.

I have been a teacher for more than 25 years. I have had the chance to serve children, adolescents, and adults alike in the public and private sector. Ten years ago I decided that I was going to turn my fascination for the human mind into my work. I decided that my ideal of a more cooperative society should start with (self) compassion. I decided to start educating the judgmental tendencies of my mind and try to understand. Currently, I work for the *Institució*n *Universitaria Colombo Americana - ÚNICA*, a modest teachers college whose mission is to transform society by inspiring the future educators to understand, learn, practice and teach habits that point towards the betterment of our communities and themselves.

One of the classes I teach is Autonomous Learning. The objective of the class is to help students realize their agency. By means of experiential learning I want my students to take charge of their own learning. I want them to saunter through Bloom's taxonomy and become agents of their processes. I want them to fall in love with the complexity of learning and the beauty of being able to share it with simplicity.

I usually ask them if they know Albert Einstein. They usually do. I ask them then to tell me what they know about him. Some of them mention the theory of relativity and a quote stating that imagination is more important than knowledge. When I ask them about the theory of relativity, they spit out the formula we all memorized in secondary school: $\boldsymbol{E = mc2}$. "Energy equals mass times the speed of light squared." I keep pushing and ask them to explain to me what that means. The room, more often than not, goes silent. I don't blame them. They are future language teachers. They are not required to know about physics. To break that awkward silence, I bring up Einstein's quote about imagination, and I ask them to tell me what they think about it. Most of them say they agree with it. And I keep asking, "Why is imagination more important than knowledge? What is knowledge? What is imagination?"

I don't do it sanctimoniously, though. It is not that I have definite answers myself, but I do like to wonder about these things. What I try to do by asking these questions is to show them how little we know about everything and how useful it is for us all to try to shed some light on the sea of ignorance we live in. Oddly enough, *Grammarly*, a writing program I use, is telling me that some readers may object to a preposition such as *in* at the end of a sentence. It suggests that I reword the sentence if my readers are likely to object. Are my readers likely to object? Are you likely to object? On what grounds? Should I care if you object? Whose rules are these, anyway? What are rules? What is the usefulness of following rules? Are there any axiomatic principles regarding teaching and learning? How are they axiomatic? What are our certainties? What makes them so certain? I tell my students and remind myself that we need to understand that our assumptions, useful as they might be, also blind us to different readings.

To illustrate this point, let us remember an event that took place at the beginning of the global quarantine we are going through. A lot of people went on toilet paper frenzy. They started stocking up on toilet paper like mad. I am sure they won't need toilet paper any time soon. While they were busy buying toilet paper, another significant segment of people was pointing at them because that was "in fact" a reproachable act of selfishness that "only" the most despicable among us would do. My Facebook feed was flooded by hundreds of memes and comments reflecting that sentiment. The "good" people armed with pikes and torches were taking the "bad" people to the "purifying" fires of public scorn. However, this apparently reasonable reaction does not explain away the fact that some people indeed bought toilet paper by the truckload. What the "good" people did is not an explanation; it is a judgment. And very frequently, we don't know how to tell them apart.

ENTER COGNITION AND METACOGNITION

When we talk about cognition and metacognition, the central character is the mind, and this is where things get tricky. What is the mind? Is there any standard definition for it? Are there many? Our answer to that question reveals the way we see the world and the way we interact with it. That's neither good nor bad. It is what it is.

For a lot of people, the mind is simply the product of brain activity. For others, this notion is too reductionist. I side with the latter. Daniel Siegel, the leading figure of a field called Interpersonal Neurobiology, defines the mind as an emergent, self-organizing, embodied and relational process that regulates the flow of energy and information. I am what I am through my interactions with the others in a shared environment. Our well-being, personal and social, depends on the quality of that process. The quality of that process depends on our understanding of the consequences of our relational tendencies and the realization of the changes we can bring about through our agency.

Is there anything we can do to be more aware of this process? Sure, there's plenty of ways; plenty of metacognitive strategies, so to speak. Mindfulness meditation is one of

the most useful tools I have come across to study my mind, understand this process, and harvest the benefits of really paying attention to what I do. It has allowed me to turn my mind into the object of my attention. It has allowed me to approach my mind the way ethologists approach their subjects. It has helped me to be more present in everything I do.

If you are new to the practice, I invite you to give it a go. Have a seat, close your eyes, and try to focus your attention on your breathing. When you get distracted, gently bring your attention to your breathing again. Start small; say five minutes for a couple of weeks. Keep a journal and jot down what you experience. Mindfulness teachers suggest that we follow these three guidelines when practicing:

Avoid any judgment.

Accept anything that shows up on your mind.

See everything with compassion.

Aristotle says, "We are what we repeatedly do. Excellence, then, is not an act, but a habit." As educators, I believe it is our responsibility to study the way we learn and the way we teach. We should pay attention to our minds and practice what we preach. We need to walk the talk to know by experience how hard it is to acquire new routines whose benefits we understand conceptually. We need to be more human.

It is easy to lose hope and direction. Our minds are hardwired to stick to the negative. The media continually overstimulates our amygdala; their motto is "If it bleeds, it leads." However, if we as educators decide to go beyond our assumptions -- sometimes hopelessness -- and try to understand what makes humans click, we can find idiosyncratic ways to better serve our communities and ourselves while tending the seeds of change.

The chapters here contained are reflections of dedicated educators who have decided to formalize their practices through research. Go through the titles and choose something that calls your attention. Read it, and write a reflection on how you can incorporate the findings into your context, see what happens, tell your students what you are doing, invite them to play the game, build your community.

I want to wrap up this foreword with a quote by Humberto Maturana that resonates with my approach to teaching and learning, with my approach to life.

> People sometimes say that children are the future of humanity. However, I don't think this is the case. I believe that the future of humankind is adults. Young people are transformed through their interactions with adults. Thus, adults have a great responsibility. Adult people should pay attention to what we do, to what we choose, to what we think, for we are the future of humanity.

Happy learning!

CHAPTER 1

THE MIND AND DESIGNER LEARNING

JOSEPHINE TAYLOR

Learning and learning behaviors exist in all species, we could argue. Adaptation, survival and evolution speak to learning as a continuous state. One important thing about learning, especially learning in response to difficulty and challenge, is that it may not always result in the achievement, improvement, or positive outcomes which have come to be inseparably linked to our conceptualization of what learning is, especially in education. On an evolutionary scale, and applied to all species, including but not limited to the classroom, learning implies a change within the species. What is visible, measurable, or considered a product of learning may not always or even generally show achievement or outcomes. The result more often than not may be bruises, feelings of defeat, and tired sighs that say, "Back to the drawing board." Because failure is a more likely outcome than success in possibly most human endeavors, we try again. In education, it is our job to try again, and again, and maintain an optimistic attitude towards learning and our learners. I tell people and I feel, teaching is most often an experience of repeated failure. Not all classes are comfortable, productive, interesting, personalized, or challenging in just the right way. Learners are all individuals with unique histories, narratives and motivations.

Still, in education, learning as an idea has recently come to be envisioned and accepted as a desired aim, objective, goal or outcome. Indeed, we use these words constantly when thinking, talking and writing about education and educational programs today. This positive, positivist if you will, view of learning, that it is not something ephemeral, unreachable, and fleeting, but rather an attainable objective goal, brings with it an intense consideration of methodology. If the goal of learning is achievement, in like fashion, we become interested in and believe that there must be ways to inherently improve and enhance these processes, outcomes and behaviors. Pick up any publication about teaching, education and learning today; look at any curriculum for any subject, program statement or even educational policy, and it will most likely reflect this positive, optimistic orientation: learning is achievable, every student can learn, and when we talk about learning we are referring to evidence of competence in the form of concrete learning outcomes. Indeed, much of the official discourse today of education ministries and other authorities echoes this characteristically outcome-based view of education.

It is difficult to move outside this paradigm as it has come to dominate and actually order not only the discourse we use to talk about learning, but our deeper understanding of learning processes in schools and classrooms. Our battle scars, visible after particularly challenging experiences, are not validated as sources of frustration that might lead us to consider other paradigms. On the contrary; we brush ourselves off and try again. We strive to provide scaffolding for learners to overcome challenges and smoothen the learning process. We think and act as if learning should be easy, seamless. We carefully craft experiences for our students, aimed towards success, with rewards, even badges or rankings that have no inherent relationship to the learning per se. We covet the teaching strategies that will lead to better learning. In short, we function in a marketplace of learning in which education is a consumer-driven business, and teachers, schools and programs must exhibit academic achievement in the form of measurable learning outcomes in order to compete.

Linked to this obsession is an intense attention to methodology, and with it the implicit understanding that learning can be maximized, that there are actually superior forms of engagement with content, hierarchies of thought processes, and teaching and learning strategies that promise to enhance performance and hence outcomes. Dedicated teachers today know that they must know their learners, and must craft teaching strategies for those learners so that each individual might connect to knowledge, maximizing their natural knacks and abilities, and acquiring new academic and procedural skills to compensate for challenge. We can frame this search for just the right understanding of learners and the precise aides to help them within the past three or four decades, from a consideration of learners as unique individuals with unique brains, to a plethora of thinking and procedural tools to enhance all learning processes, even what we might come to know as a new cycle of designer teaching methods.

And yet, so overwhelming seems the need for tools and methods, the need to stay abreast, ever on the edge of the latest approach, that most of us, this teacher included, have never stopped to question the paradigm. This is the currency of our world today. Still, there has been and continues to exist a voice for transformational education, learning that aims not towards achievement of outcomes but rather individual growth and self-knowledge. Today, others have continued this path with recent renewed interest in moving away from the hubbub of action-centered methodologies to the need for a deeper and more transcendental consideration of the learner's self as a timeless entity that requires nurturing, regardless of any interest in knowledge production or demonstrable expertise.

In our search for better, more "effective" methodology, we can find theoretical discussions and identify conceptual frameworks and underpinnings for much of the new methodologies, focused on enhancing thinking and learning. We can also find teaching materials, curricula and methodologies to aid us in identifying and implementing these ideas. There is now research that supports some or much of these innovations in real classrooms with real students. However, we need more. It is surprising that the advocates of many of these methods attempt to sway teachers and institutions into adopting them without inviting an inquiry-based experience; rather, publishers and other curriculum businesses simply tout the benefits of certain programs or approaches as one-size-fits all,

ironically, when the paradigm they ascribe to is based on the premise that each student is unique. There is a keen need to document and systematize these experiences locally as most outcomes-based approaches are "imported," coming initially from other continents and contexts. They must be applied and field tested in our local context, in a critical fashion. The mission of *Voices from the Field* is precisely this: document and share local studies by teacher-researchers in an effort to expand and deepen the knowledge base of practice.

The current volume of *Voices from the Field* aims to contribute to the need for research in situ by the very teacher-researchers implementing the innovations with their own students in their own classrooms. In this volume, we dedicate ourselves to sharing the many studies from the Specialist Program in Bilingual Education focused on enhancing and deepening learning itself, often through explicit attention to the learning process and learning strategies. Many of the studies focus on metacognition, initially conceived of as control over one's cognitive processes (Flavell, as cited in Ibañez Carrascal, 2019), or thinking about our thinking, or cognition about our cognition (Flavell, as cited in Giraldo Durán, 2020). Today, metacognition is understood more broadly as awareness of learning, learning about and talking about learning, awareness of and thinking about cognition and cognitive processes, becoming conscious of these processes. This conscious learning in today's context is seen by many as precisely the pillar of the learning enhancement we seek. The studies in this volume then come full circle, showing us a path beyond outcomes, for those of us weary from the marketplace of designer methods. For what lies beyond obsession but contemplation. In learning, the stillness brought by contemplation and meditation not only "improves" outcomes by helping students focus, more importantly it opens paths for learning to find its own way, leading to deeper gratification and gratitude towards experiences. The volume includes two chapters devoted to mindfulness and attention to the inner self of teachers and students, and a search for something more profound than thinking and doing, and its effects not only on academic outcomes, but on behavior and community.

This is the third volume of *Voices from the Field: Research from the Specialist Program in Bilingual Education*, published by the *Institución Universitaria Colombo Americana - ÚNICA*. The series is devoted to the sharing of chapters by teacher-researchers enrolled in our program, based on the studies conducted as part of their graduation requirements from the institution. Most of the chapters represent initiatives of action research by experienced and dedicated teachers who happen to be first-time researchers. The goal of the program and our publication is to share as much of this local research as possible, empower first-time researchers to publish their work, and especially to support and strengthen teacher research as a basis for knowledge in the country, especially in Bogotá, where all of these studies take place.

Mindful Learning: Research on Learner Awareness, Metacognition, and Learning Strategies is a compilation several years in the making, featuring a range of studies by graduates of both the Specialist and Teaching Licensure Programs in Bilingual Education. The projects share specific structured applications of innovations in learning strategy training, particularly for foreign language learners, thinking tools and development in

the form of computational thinking, critical thinking and metacognition, and finally, the use of mindfulness practices with very young learners to impact both the academic and behavioral realms. Students in the Specialist program come from a range of backgrounds and professional fields. Not all are currently classroom teachers, and only some of these teachers work in bilingual schools or are involved in bilingualism or foreign language teaching. As such, candidates in the program select lines of inquiry that are unique to their context and interests. In this way, the program's broad treatment of teaching issues, and commitment to inclusion, transformation and quality, allow content to become applicable to each of them.

This volume picks up where many of us continue to find ourselves, convinced of the power of thinking and learning tools, especially for learners experiencing difficulties. Most of the first chapters in the volume deal with language learning, focused towards the explicit teaching of language learning strategies, targeted especially towards the solution of learning problems researchers have identified with specific skills like reading, or with basic level learners who lack essential vocabulary, syntax knowledge, and attitudes and behaviors conducive to language learning. The development of learning strategies as an important piece of empowering students originated from research on language learning ability and the "good language learner" (Rubin, as cited in Nunan, 2013). Indeed, this important research trend developed entire taxonomies of behaviors and traits that successful language learners possess, the implication being that if moderately successful or unsuccessful learners were able to adopt these behaviors, they would also be successful. This assumption was certainly attractive and optimistic, yet unsubstantiated. Fortunately, many teachers and teacher-researchers have assumed the challenge of adopting this point of view and have set about to explicitly train their students on the use of specific learning strategies and exploration of their own traits and behaviors as conducive to achieving their learning goals, or not.

In this sense, the first study in this volume, **Chapter 2 Strategic Self-Regulation and Multisensory Structured Language Interventions for Adult EFL Students with Language Learning Difficulties** by Carolina Vega Sarmiento, embraces this optimism. After working for years with struggling beginner-level students in the Centro Colombo Americano, Bogotá's Adult English Program, Carolina Vega discovered through her exploration of theory that much of what she was seeing can be described as Foreign Language Learning Difficulties (FLLD), referring to a particular challenge that these learners face in cracking the linguistic code of a foreign language (Ganschow, Sparks, & Javorsky, as cited in Vega Sarmiento, 2020). Different from learning disabilities, these students' challenges are not mirrored in other forms of learning or learning in their native language. These difficulties may also be a result of individual learner differences as not all students possess positive attitudes, beliefs or motivation towards language learning (Ganschow & Sparks, as cited in Vega Sarmiento, 2020). Researchers point to the successful application of the multisensory structured language approach to work with FLLD students (Ganschow & Sparks, as cited in Vega Sarmiento, 2020). Vega Sarmiento was able to identify other innovations from the learning strategies and metacognition literature that offered concrete techniques, and specifically applied a combination of strategic self-regulation and multisensory structured language.

Vega Sarmiento's study features the innovative strategy of using multisensory (visual, auditory and kinesthetic) channels for transmitting information to learners. Indeed, it can be maintained that the work on language learning strategies is filled with creative application of principles of learning styles, differentiation, and accommodation of content, especially for students with difficulties. These applications differ to the extent that teachers use these strategies explicitly with students, or name them according to the available taxonomies, such as Oxford's (as cited in Vega Sarmiento, 2020) or refer to them by other names, possibly to aid students in grasping the ideas behind or operations involved in the strategies. What we do know is that learning strategies can provide quite useful aids for students, even students at very young ages. We also know that teachers themselves can be quite original, creative and innovative when applying them in the classroom. One such creative application is featured in **Chapter 3 The Effect of Translation Strategies on the Acquisition and Retention of English Vocabulary in Second and Third Grade Students** in which Camilo Alberto Cardona Lozano implemented three translation strategies explicitly with very young English language learners in order to positively impact the acquisition of new vocabulary and the retention of previously introduced lexis. Although translation is often discouraged in the foreign language classroom, others argue that its targeted use can be beneficial, especially in the early stages of language learning (Stibbard, as cited in Cardona Lozano, 2018). In Chapter 3, Cardona Lozano argues and demonstrates that helping learners make connections between the first and second language gives especially young students at beginner levels a crucial tool for deciphering new words and retaining vocabulary that has already been taught. His study focused on three particular translation strategies: cognates, bilingual dictionary, and glossaries. His results indicate strongly that not only did students' acquisition and retention of vocabulary improve after the intervention, but that learners were well aware of the strategies and able to gauge their effectiveness.

Learning strategies have also been linked to particular language skills. Our text features two studies devoted to reading strategies in particular: **Chapter 4 Using Graphic Organizers to Improve Reading Comprehension and Motivation towards Reading in High School Students** by Alexander Izquierdo Castillo and Narda Liliana Rodríguez Sosa, and **Chapter 5 Effects of Explicit Teaching of Metacognitive Reading Strategies on Fourth Graders' Strategy Awareness and Use** by Adriana Mena Giraldo. Reading strategies have often been discussed together with reading skills, such as skimming, scanning, reading for details, guessing meaning from context and inferencing. Our studies, however, focus more on explicit pedagogical strategies that provide added support for students as they approach texts in English, aimed towards higher interaction with texts and better comprehension as a result. Izquierdo Castillo and Rodríguez Sosa's study focuses on the use of graphic organizers, specifically on semantic and story maps, with 11th graders. Typically, teachers struggle motivating adolescent learners to read, especially in the foreign language. This study demonstrates that students' lack of interest in reading is not due to poor reading habits or limited cultural background, but rather clearly shows that a lack of strategies, leading to poor text comprehension, might actually be the source of this ambivalence. Specifically, most students not only lack basic reading skills and strategies, but struggle specifically with a lack of both content and formal schema as well as schematic knowledge

(Brown & Lee; Hedge, as cited in Izquierdo Castillo & Rodríguez Sosa, 2020), which might allow them to access new texts effectively. In their study, through explicit instruction and practice with graphic organizers, students became comfortable using these tools and gained enough expertise to use them independently, which in turn led to a decrease in anxiety and disinterest towards reading. Their increased efficacy led directly to stronger motivation, even excitement, about reading, even about reading in English.

Mena Giraldo's study also advocates the explicit use of a metacognitive tool with older primary students to improve reading comprehension and awareness. Specifically, this metacognitive tool supports both explicit and implicit reading processes (Grabe, as cited in Mena Giraldo, 2016). In this study, students used the "PROMISE" tool to approach and analyze written texts, leading to higher awareness of reading processes and better text comprehension. The studies indicate that learning strategies and thinking tools can and should be taught explicitly to students, which aids in students' awareness of these tools as well as their impact on learning. Of course, even when introducing strategies explicitly, these studies advocate a balanced, staggered, and age-appropriate approach.

Cognitive and metacognitive learning strategies and thinking tools, when used consistently with a clear purpose, can indeed enhance learning and provide students with crucial self-efficacy. They also help educators tap into students' thinking skills, helping them become open to new thinking tools and trained to challenge their own paradigms and existing schemes. Indeed, regular reflection by teachers about enhancing thinking can help push classroom practices beyond the use of strategies as tools to enhance particular language or academic skills, and towards the development of thinking for thinking's sake. There is plenty of publication on critical thinking and higher-order thinking skills, pointing towards the need for today's learner to be a flexible thinker in order to face the challenges of the 21st century. Still, there is a lack of scholarship on the development of particular thinking skills with a broad range of learners. The current volume of *Voices from the Field* features two such studies. First, John Hames Forero's study, **Chapter 6 Critical Thinking Activities to Develop Critical Thinking Sub-skills in Elementary-level English Language Students**, breaks new ground by focusing on particular critical thinking sub-skills within a beginning English language course for university students. Flexible and critical thinking is crucial for all human beings, but especially at university. Typically, students, especially first-semester students, lack these tools as most high schools do little to develop them explicitly (Shaila & Trudell, as cited in Forero, 2017). Further, by working with these skills in the foreign language, learners can be pushed from the beginning beyond English just for basic interpersonal communication towards thinking in English. This endeavor is not without its challenges, and Forero's study points to students' tendency to relativize values and shy away from making choices. As other studies in our volume indicate, these inherent difficulties in helping learners develop strategies and thinking skills do not mean that teachers should abandon such efforts; rather, that an approach that is both gradual and consistent can aid students in questioning their own and others' underlying assumptions as a matter of course.

In the Specialist Program, many teacher-researchers see the importance of the explicit teaching of thinking skills to all age students, but especially middle and high school. In **Chapter 7 Using Interactive Programming Environments for the Acquisition of Computational Thinking Skills in High School Students,** Mercedes Carolina Ferrer Rondon focused her attention on computational thinking, which most school curricula continue to ignore. Computational thinking includes reasoning skills, including algorithmic thinking, that may be applied to problem solving needs (Garrido; Gonzalez, Diaz-Herrera, & Tucker; Greher & Heines; Riley & Hunt, as cited in Ferrer Rondon, 2016). Ferrer Rondon's treatment of the topic makes clear that computational thinking is not just a fashionable way to introduce technology into school curricula, but that these skills help reveal underlying layers of important thinking processes. In addition, in programming environments, thinking is made visible by requiring learners not only to obtain results, but to understand and explain how those results were brought about. By making thinking visible in this way, it is possible to evaluate whether the path chosen is correct and whether it will work again in new environments.

These teachers who gravitate towards teaching thinking are most likely critical and metacognitive thinkers themselves. Research indicates that teachers who are not metacognitive do not develop those skills in students. In **Chapter 8 Metacognitive Training and its Influence on English Language Teachers' Awareness and Classroom Practices,** Tania Isabel Ibáñez Carrascal explores the source of teachers' metacognitive training. Her research focuses on an English language program that requires teachers to train young learners explicitly on cognitive and metacognitive learning strategies; however, it is unclear how the link between teachers' metacognitive knowledge and students' metacognitive skills are intended to intersect. Metacognition is becoming more popular recently, and includes several components, specifically knowledge about cognition, including self-knowledge, self-awareness and metamemory (Cray; Hacker, et al., Zull, as cited in Giraldo Durán, 2020), as well as regulation of cognition, including world knowledge, experiences, goals (tasks), and strategies (Flavell, as cited in Giraldo Durán, 2020). Metacognition is especially interesting for teachers seeking to help learners increase their awareness of their own thinking. However, Ibañez Carrascal discovered that most undergraduate teaching programs feature little to no training on this topic. Rather, in the case of her study, and in Ruiz's study in this series, training on metacognition only occurs as a result of curricular or professional development initiatives within schools and institutions. Indeed, Diana Ruiz's study in **Chapter 9 The Impact of Non-Explicit Teaching Strategies for Metacognition on the Metacognitive Awareness of Fifth-grade Students** illustrates that although the school has fostered work on metacognition among teaching staff, there continues to be a lack of clear curricular objectives or common language among teachers to work on this. As a result, metacognitive strategies in the classroom are addressed in a non-explicit way. While learners have internalized some of these strategies and are able to talk about their learning processes in a conscious way, they lack a common vocabulary for or higher awareness of metacognition.

It is important to point out that many of the strategies shared above not only improve learning, but also boost students' awareness, motivation, confidence and self-efficacy. Being better equipped to face learning challenges actually enhances positive attitudes and behaviors towards tasks. Indeed, many practitioners in the Specialist Program point to student motivation, physical and emotional wellbeing, social relationships, and self-knowledge not only as underlying aspects of learning, but as overriding human concerns that take precedence over academic performance. It is difficult to find research, even research focused on these human variables, that is not connected to academic outcomes and achievement. Yet, many of the students in the Program argue that human development and compassion are not only worthy of inquiry for their own sake, but are precisely the primary concerns of educators. In this direction, an increasing number of teacher-researchers have begun inquiring into areas of human development and consciousness beyond technique and deeper than thinking. Specifically, meditation and mindfulness have caught the attention of many teachers through their own personal paths, which have led them to these practices. Mindfulness has its roots in Buddhist meditation, but its application and spread to the Western world is credited to Jon Kabat-Zinn (as cited in Atuesta de Greiff, 2019), who defined it as "paying attention in a particular way: on purpose, in the present moment, and in a non-judgemental manner" (p. 14). This movement towards the stillness of the inner mind and self seems an apt closing to this volume of *Voices from the Field* as it offers a place for contemplation in the face of the many options available to teachers and the many distractions facing learners and learning consumers for ever better, faster products promising brighter futures linked almost exclusively to higher financial rewards. Indeed, in the stillness and distance of contemplation and meditation, all things fall into their natural place and a new "ranking" emerges with new priorities. It is only fitting that we end here as this movement may indeed point the way forward.

The two studies both stem from the teacher-researchers' own experiences with mindfulness practices as well as their specific concerns over very young learners' inability to focus on tasks and their lack of empathy towards their fellow classmates. In **Chapter 10 Using Mindful Classroom Strategies to Improve Behavior and Cognitive Development in Kindergarten Students,** Inés Elvira Atuesta de Greiff found that regular practices of mindfulness made a clear positive impact in students' relationships with others, which extended to their families. In addition, she was able to identify a marked improvement in kindergarteners' ability to focus, as evidenced in their performance in writing, suggesting that mindfulness enhances not only behavior but also cognitive development in very young children. Benefits of mindful practices cut across age groups as well as socioeconomic level. While the students in Atuesta de Greiff's study come from wealthy backgrounds, in **Chapter 11 Mindfulness-based Social Emotional Interventions for Recognition and Modification of Aggressive Behavior in Preschoolers,** Valery Alejandra Rojas Atehórtua carried out regular mindfulness routines with children who attend a preschool from the public welfare system in Bogotá. Rojas Atehórtua focused her intervention on the reduction of aggressive behaviors in these youngsters, and was able to achieve a clear decrease in these behaviors as a direct result of the mindful practices she implemented.

It is with this full circle of approaches, practices and research that *Mindful Learning: Research on Learner Awareness, Metacognition, and Learning Strategies* bears testimony to these teacher-researchers' paths, as they sought to improve learners' awareness and skills in an effort not only to boost academic outcomes, but also to enhance and strengthen learners' connection to and consciousness of their processes. As all the research has borne out, improvements in awareness, skills and strategies are linked strongly to individual variables such as attitude, belief, self-efficacy and motivation, building a stronger sense of self as well as academic and personal confidence among teachers and students. It is our hope that readers of this volume will be inspired to seek out their own paths of self-knowledge, and the source of mindful practices.

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CHAPTER 2

EFFECTS OF STRATEGIC SELF-REGULATION AND MULTISENSORY STRUCTURED LANGUAGE INTERVENTIONS ON ADULT EFL STUDENTS WITH LANGUAGE LEARNING DIFFICULTIES

CAROLINA VEGA SARMIENTO

Thousands of adult students enroll in language institutes throughout Latin America each year to learn English, many at the basic level. It is not uncommon for teachers to find that some students struggle in the first steps of language learning, many quickly dropping out of these programs, often more than once, in a repeated cycle of frustration. At the Centro Colombo Americano in Bogotá, Colombia, in fact, most students in the first levels do not complete the 18-month program, and many drop out at the very beginning of the program, even after the first course. It has long been thought that these struggling learners would benefit from more support in the form of tutoring in specific strategies for the learning of vocabulary, pronunciation, basic syntax of English, and essential language learning and study skills. In fact, the Center created a tutoring service in the Adult Program with precisely this objective. Still, many teachers at the Center, including teacher-researcher Carolina Vega, argue that all students should benefit from training in learning strategies as part of the regular classroom experience. After exploring the subject of language learning difficulties specifically, this study proposed and carried out an intervention with an experimental group using multisensory structured language and strategic self-regulation strategies. These strategies proved to be promising in addressing the very particular but essential issue of language learning difficulties in beginning students.

ABSTRACT

This study focused on the use of an explicit mixed-method strategy training for students with Foreign Language Learning Difficulties (FLLD) at a language institute in Bogotá. The training, applied to an experimental group, integrated strategic self-regulation and multisensory structured language strategies. The intervention featured a set of eight strategies focused towards specific language elements, namely syntax, semantics, morphology, and phonology. The strategies also targeted visual, kinesthetic and auditory channels simultaneously. Learners applied the strategies and evaluated their learning process. Improvement over time was documented through pre- and post-questionnaires, pre- and post-language tests, direct observation by the teacher-researcher, and contrast to a control group who received no training. Findings reveal that by applying the mixed method training, participants in the experimental group, particularly those with FLLD, became more accurate in both their oral and written production. Further, analyzing content simultaneously throughout visual, kinesthetic, and auditory channels proved to be particularly motivating for these students, and they reported a feeling of success using the strategies, as well as increased self-control over their learning.

Key words: Foreign language learning difficulties, Self-regulation, Multisensory learning, Learning strategies, Language proficiency

RESUMEN

El presente estudio está enfocado en el uso de una estrategia explícita de método mixto para estudiantes con dificultades de aprendizaje de idiomas extranjeros (FLLD) en un centro de enseñanza de inglés en Bogotá. El entrenamiento, dirigido a un grupo experimental, integró estrategias de idioma multisensoriales y de autorregulación estratégica. Durante la intervención se usaron ocho estrategias enfocadas a elementos específicos del idioma tales como la sintaxis, la semántica, la morfología y la fonología; estas estrategias fueron dirigidas simultáneamente a los canales visuales, kinestésicos y auditivos; y los estudiantes tuvieron la oportunidad de aplicarlas y evaluar su proceso de aprendizaje. Por medio de cuestionarios y pruebas tomadas antes y después de la intervención y de la observación directa documentada por la docente-investigadora, se reportó un mejoramiento a lo largo del proceso. Los resultados revelan que, aplicando el método mixto anteriormente mencionado, los estudiantes, especialmente aquellos con dificultades en el aprendizaje de idiomas extranjeros adquirieron mayor precisión tanto en su desempeño oral como en el escrito. Un análisis posterior del contenido de manera visual, kinestésica y auditiva comprueba ser particularmente motivador para estos estudiantes los cuales reportaron una sensación de éxito y autocontrol de su aprendizaje al usar las estrategias.

Palabras clave: Dificultades de aprendizaje de idioma extranjero, Autorregulación, Aprendizaje multisensorial, Estrategias de aprendizaje, Competencia lingüística

In the last 30 years, education has turned to the learner, and theories, research and methodologies have sought out tools to facilitate learning. In the context of English language teaching, researchers and theorists have argued and substantiated the benefits of learning strategies to facilitate and maximize learning. Specifically, studies implementing these strategies indicate that well- or high-performing students either already apply these strategies or can be taught to use them successfully. In these cases, the strategies tend to aid in the process of organizing language learning and internalizing new language. However, few studies focus on helping slower-paced language learners who do not have a broader learning disability per se, but who struggle to learn a new linguistic code and often show delayed progress in all foreign language skills.

In addition to possessing (or not) the strategies that help language learning, adult students particularly present a number of variables that also influence their process of learning English, including motivation, anxiety, self-confidence, and attitude. In terms of language, these students typically display difficulties using grammar, phonology, and semantics, as well as oral and written communication (Ganschow, Sparks, & Javorsky, 1998). Some studies focus on interventions in these specific language learning difficulties using assessment, multisensory instruction, and self-regulated learning. Positive and successful results have been shown in learners' progress through direct instruction in these strategies, which have impacted not only students' language performance, but also their emotions and attitudes towards learning. Research points to the effectiveness particularly of strategies related to multisensory structured language and strategic self-regulation. Findings suggest that active learners who become aware of their performance are better able to positively impact their learning, apart from the use of multisensory representations, which give them more opportunities to process information.

More schools and language centers see the need to address language learning difficulties. The *Centro Colombo Americano Bogotá*, where this study took place, has been implementing strategy training for over ten years, using a range of set learning strategies, mostly cognitive or behaviorist in nature (learning about language and learning how to study). These strategies are offered to all students, not only struggling students, suggesting that there is no differentiated approach at present. In Colombia generally, there is a lack of research about strategy use with struggling students. In the institution of the present study, one study was conducted on the tutoring service that supports these struggling learners (Taylor, Gómez, Quintero, Nausa & Rey, 2011). The tutoring service in question promotes explicit content teaching on aspects of the English language thought to be useful for students with difficulties (learning the international phonetic alphabet, learning basic syntax of English) as well as general learning strategies (recording and studying vocabulary) and study skills (using course materials to prepare for class).

Despite clear emphasis in the Center's programs and philosophies on the explicit teaching of learning strategies, particularly to students with foreign language learning difficulties (FLLD), it is unclear if the tutoring service leads to a positive impact in students' learning, particularly class performance. Furthermore, diagnostic information carried out

for this study at the Center indicates that most who receive tutoring are only referred after a minimum period of language exposure (three months), instead of being sent as soon as their process begins and difficulties are noted. Further, teachers appear to be at a loss as to how to aid these students or implement plans of action to help them overcome their difficulties inside the classroom. In terms of class performance, learners with difficulties are generally unaware of strategies, or how to use strategies independently, particularly how to select a strategy to solve a particular learning challenge. Preliminary diagnostic inquiry for this study also revealed that instructors tend to teach using the same learning style they possess, overlooking the fact that each student's brain is different and needs to grasp information naturally and meaningfully through all channels of input (Institute for Multisensory Language Education, n.d.).

For these reasons, this study was thought to be relevant as more students enroll in English courses every day, but not all of them are successful reaching their goals. It is necessary to assist struggling students, especially in basic levels, and especially as part of the normal classroom experience. This research proposed the implementation of a method mixing strategic self-regulation and multisensory structured language training with basic students, both with and without foreign language learning difficulties (FLLD), in an experimental group, and the regular teaching to a control group similar in composition. The results are thought to shed light on new tendencies and behaviors that could be adopted by language teachers and foreign language learners in EFL classrooms. Specifically, the study explored the influence of the multisensory structured language (MSL) in FLLD students' language proficiency as well as the effect of strategic self-regulation (S^2R) on their language performance and on individual difference variables.

LITERATURE REVIEW

Foreign language learning difficulties (FLLD) have been a topic of interest for researchers. FLLDs do not indicate a broader learning disability, but are particular to foreign language learning in students without learning disabilities. Symptoms of foreign language learning difficulties include students not being able to successfully complete tasks related to grammar, phonology/orthography, semantics, and/or oral and written communication. Research on FLLD has focused on the implementation of methodologies to overcome them and the real impact of these interventions on underachievers. Within this body of research, some studies focus on FLLD in general, others focus specifically on the implementation of two strategies in particular: the multisensory structured language approach (MSL), and strategic self-regulation (S^2R) and their benefits on learning, particularly in students with FLLD. The present review addresses these three main issues: (a) factors that influence students' difficulties when learning a foreign language, (b) the use of MSL techniques and instruction to remediate learners' difficulties and its benefits in general, and (c) S^2R, which encompasses strategies to develop metacognition and self-efficacy as a way to impact foreign language learning drawbacks.

As a general trend, research indicates that MSL and S^2R are successful with low achievers, not only with language elements, but also on emotional and motivational factors. Both teachers and students report that using methods that target individual and specific learning styles and provide students ways to control their learning process positively contributes to students' understanding of a foreign language and supports progress in general. Interestingly, these strategies do not appear to involve changes in curricular content per se, rather in the way instruction is delivered. More studies about the use of MSL and S^2R with FL at-risk students are needed, however, in order to see how these methods influence different populations and individuals with a variety of learning difficulties.

CHARACTERISTICS OF FOREIGN LANGUAGE LEARNING DIFFICULTIES

Researchers have been interested in struggling students, particularly in understanding why learning another linguistic code is a barrier for some. Most of the studies address the origins of learning difficulties, the repercussions in class behavior, and how oral and written performance are developed in classrooms. Researchers like Ganschow and Sparks (2000) have devoted their scholarship to the understanding of FLLD, the consolidation of theory, and the challenges they have observed. In general, their findings indicate that the problems struggling learners exhibit are primarily language-based, but that anxiety can be an important secondary factor influencing FLLD. Ganschow and Sparks report that underachievers have difficulties grasping and using the rule systems of language, first and foremost the phonological and orthographic systems. In addition, these learners lack metacognitive skills, such as self-correction and monitoring, and do not develop these without explicit instruction.

Linguistic elements or systems of language seem to be the root of FLLD, but not exclusively. Castro and Peck (2005) inquired into additional elements that may play an important role in FLLD, other than linguistic deficit. The researchers administered the Kolb Learning Styles Inventory in order to explore this. Preliminary results showed that regardless of any particular language learning difficulty, teachers' targeting of learning styles do not necessarily help student success as they may select the wrong learning style for a particular student. With this in mind, this study indicated that knowing about students' learning style preference is of great importance for teachers and students as an aid to presenting and receiving information.

Other secondary variables in FLLD include students' perceptions. Williams, Burden, Poulet, and Maun (2004) found that students' perceptions of their level of success depend on 21 attributions: effort, strategy, ability, teacher, interest, task, ease, peers, mood, behavior, personal organization, need/importance, environment, circumstances, independence, teaching materials, time, other people, distractions, rewards, and luck. The study looked at secondary attributions for success and failure in learning a foreign language, and examined the ways in which this may vary according to age, gender, perceived success, and the specific language studied.

In a related study, Matthews (2010) investigated factors that affect students' self-efficacy for learning Italian, French, Spanish and Portuguese, in tutoring sessions on these languages. He discovered that learners' self-efficacy depends partially on the relationship between tutor and tutee. In addition, self-efficacy increased throughout the course of tutoring sessions due to the unique conversational patterns between the tutor and tutee. These unique patterns appear to be significant and speak to the need to personalize tutoring for struggling students rather than implement the same strategies for all. In agreement with Williams et al. (2004), Matthews (2010) recognizes the teacher or tutor, task, environment, and teaching materials as crucial factors in understanding FLLD students. Again, communication between instructors and learners appears to be significant in helping underachievers.

Schneider and Ganschow (2000) also examined effective communication and identified the assessment/teaching cycle as decisive, especially when teachers act as facilitators and assessors of students' performance in interactive and reciprocal communication. In their exploration of dynamic assessment with students with FLLD, they identified five strategies that worked with struggling learners, specifically in terms of metalinguistic awareness: (a) thought-provoking questions and gestures, (b) pleasant error-making atmosphere, (c) analytic assessment, (d) mnemonic devices, and (e) structured learning material that enhances students' organization and planning of learning.

In terms of causes of FLLD, studies indicate that apart from linguistic deficiencies, emotional, interpersonal, and instructional factors also contribute to students' struggles learning a foreign language. However, tutoring and effective communication appear to ameliorate all of these issues. Specifically, research suggests that learners benefit from direct, systematic instruction in the phonological/orthographic, grammatical/syntactic, semantic, and morphological rule systems of language. Taylor, et al. (2011)'s study of strategy training for struggling EFL adult students in a tutoring program focused on instructing learners in study skills and language learning strategies. Analysis of over 1,000 students' tutoring folders demonstrated clear patterns as to common difficulties addressed in the sessions. Specifically, language-based issues were found to be common among all students with FLLD, particularly lack of knowledge about linguistic elements and how language works, as well as a lack of effective study skills for language learning. In terms of impact of the tutoring service, the tutored students in the study dropped out before completing the Center's complete program of 18 levels to reach a B2 level (CEFR) although the percentage of desertion was identical to that of the general population with no tutoring or FLLD. Further, tutored FLLD students' rate of desertion occurred at a slightly slower pace than regular students. Both of these findings indicate that the training seemed to support these students.

MULTISENSORY STRUCTURED LANGUAGE (MSL)

One particular strategy explored as support for students with FLLD is Multisensory Structured Language (MSL). MSL encompasses structured, systematic, aggregate, cognitive, meaningful, and emotionally-focused instruction involving the use of visual, auditory, and kinesthetic-tactile channels, which work simultaneously to boost memory and language learning. Several studies presented by Ganschow and Sparks (2000) explore MSL as a technique to work with at-risk students in foreign language as well as learners with dyslexia; similarly, other researchers have found multiple benefits with MSL, including improved language aptitude as well as enhanced oral and written performance.

A review by Sparks and Miller (2000) explored studies focused on the use of MSL strategies to teach foreign language phonology/orthography, grammar, and vocabulary to underachievers. They report that students with FLLD can be helped by using the MSL approach with direct instruction in vocabulary, phonology, orthography, and grammar. The reviewed studies showed that learners performed better in oral and written production in both their native and foreign language. Further, it was not necessary to alter the curriculum in order to implement MSL techniques; rather, it was possible to modify instruction to fit the strategies. Similarly, Schneider and Evers (2009) used evidence-based MSL strategies in cross-linguistic studies to teach any language. The researchers intentionally presented the MSL teaching techniques to remediate difficulties in reading, writing and speaking English. The application of these strategies improved FLLD students' pronunciation, spelling, reading, vocabulary, and grammar. Further, the study suggests that both teachers and students need to be trained in the method so that learners might know how to use the strategies autonomously.

Some comparative studies have been carried out as well to demonstrate the effectiveness of MSL instruction. One significant example was presented by Sparks, et al. (1998) in which they contrast the effects of MSL instruction in Spanish as a foreign language with the effects of traditional, textbook-based instruction on both the native language skills and FL aptitude of students both with and without FLLD. Additionally, they analyzed the oral and written foreign language proficiency of the same two groups of students. Findings indicate that students receiving MSL instruction made significant gains in foreign language aptitude, but groups receiving traditional instruction did not.

Similar outcomes were obtained by Jubran (2012), who used MSL with an experimental group in contrast to a control group in the same grade who received traditional teaching. A pre- and post-test measured student achievement in FL and the effect of the MSL approach for teaching English language skills. Pre-tests did not show any significant change in the way students achieved success in FL; however, post-tests indicated a difference in student achievement when MSL was applied. This is attributed to students' improvement in vocabulary thanks to their own engagement and the chance they were given to use all their senses. Jubran concluded that MSL is a powerful strategy to keep learners engaged, focused, and even entertained.

These positive results contrast with the fact that teachers tend to focus their teaching on one channel, usually their strongest. A preliminary study in Portugal showed that teachers mostly targeted the auditory style. Odisho (2007) was concerned with showing the different approaches to teaching pronunciation apart from focusing on the auditory channel. Adult learners of English were involved in this research featuring visual and proprioceptive (awareness of body movement) channels. Outcomes determined that addressing pronunciation with a multisensory approach aided students in achieving considerable cognitive conditioning, which supported them to produce sounds accurately.

Álvarez (2017) also found benefits using visual, auditory, and written material to facilitate content understanding in Spain. Her investigation examined how the use of subtitles aided college students' understanding, considering closed-caption viewing as an MSL technique and resource that also fit the communicative approach. Subtitles were framed into audiovisual material reflecting everyday, authentic communicative situations. In this particular case, learners faced not only the auditory input but also non-linguistic features. As a result, the mixed codes (visual, auditory and written) offered a multisensory experience that could facilitate the grasping of content.

STRATEGIC SELF-REGULATION (S^2R)

In addition to Multisensory Learning, Strategic Self-regulation (S^2R) has also emerged as a practical technique, with recent research on its use. The use of strategic self-regulation coincides with an emerging interest on metacognition, which has awakened the curiosity of a great deal of learning specialists as it develops self-awareness and thought processes. Self-regulation entails the setting of goals, organizing time and information, using resources effectively, monitoring performance, and holding positive beliefs, among others. The majority of the studies on S^2R have taken place in non-formal or non-traditional settings, focused on any type of learning difficulty, but without a specific focus on FLLD.

The U.S. Department of Education along with the Institute of Education Science (2017) compiled reports of students with specific learning difficulties and how S^2R impacted pupils' academic skills. Teachers offered explicit instruction to teach concrete strategies depending on the content area, and results showed effective ratings of students' academic performance. As students were progressively in charge of their learning, they became more conscious of what and how they were learning. Student outcomes were evidenced in 12 domains: alphabetics, comprehension, general reading achievement, math achievement, problem behavior, reading fluency, school engagement, science achievement, self-determination, social-emotional competence, social studies achievement, and writing achievement.

In targeting particular skills, Mourad (2009) explored the effectiveness of the self-regulated strategy development on writing performance in an experimental group of 67 writing-disabled secondary students, applying strategies from the S^2R model. The study reports that these learners boosted their autonomy in planning, organizing, and monitoring their pieces of writing to generate a well-structured composition.

This model has not only been used with students with difficulties, but also to enhance performance in all students. Tseng, Dörnyei, and Schmitt (2006) sought to understand the effects of a psychometrically-based measure of strategic learning (also referred to as self-regulatory capacity) in college-level second language learners, as an alternative to the scales traditionally used to quantify language learning strategy use. Researchers concluded that it is possible to design a measurement that adequately assesses the level of a learner's self-regulatory ability in a given learning domain. Their model pointed out that self-regulation can be divided into commitment control, metacognitive control, satiation control, emotion control, and environmental control. Although their study focused specifically on vocabulary, this method can also be applied in other learning domains. They further confirmed Chamot and Rubin's theory (as cited in Tseng, et al, 2006), "The good language learner cannot be described in terms of a single set of strategies but rather through the ability to understand and develop a personal set of effective strategies" (p. 95).

As pointed out previously, formative assessment practices aid students in many positive ways. In the case of self-regulation, Nicol and Macfarlane-Dick (2006) studied the behavioral, motivational, and cognitive aspects of self-regulation to demonstrate how formative assessment and S^2R improve and accelerate learning by providing students with opportunities to develop the capacity to regulate their own learning process. In their study, self-regulation was supported through formative assessment and feedback by (a) helping clarify what good performance is, (b) facilitating the development of reflection in learning, (c) delivering high quality information to students about their learning, (d) encouraging teacher and peer dialogue around learning, (e) fostering positive motivational beliefs and self-esteem, (f) providing opportunities to close the gap between current and desired performance, and ending with (g) giving information to teachers that can be used to help shape teaching. Nevertheless, Nicol and Macfarlane-Dick (2006) upheld the idea that this all depends on the way and frequency in which self-regulated learning and metacognition takes place.

Lastly, Schunk and Ertmer (2000) studied how self-efficacy and self-regulation can be successfully taught in order to reach desired results in college students' learning process. After implementing direct instruction on S^2R, outcomes projected that building efficacy requires providing students with mastery experiences, exposing them to successful models, and delivering positive feedback. Furthermore, self-regulatory competence can be developed through strategy instruction, exposure to social models, or providing students with opportunities to construct techniques and test their usefulness. In essence, S^2R has been shown to help students succeed in a wide range of language learning experiences and has supported the notion of assessment and feedback as core aspects to enhance and accelerate learning.

METHODOLOGY

CONTEXT

The current study took place at the *Centro Colombo Americano, Bogotá,* one of nine binational centers in Colombia, dedicated to strengthening the cultural understanding between the United States and Colombia by promoting English language teaching, arts and cultural programs, an English language lending library, and study in the US. Students between 16 and 70 years old enroll in the "regular" or Adult English Program. The program philosophy promotes the learning of EFL from a communicative student-centered perspective in which real-life situations, discourse competence, critical thinking, learning skills, and autonomy are key aspects. Its evaluation framework is based on formative assessment within task- and project-based approaches, and attempts to develop the four language skills as well as positive learning attitudes and behaviors so that students become active participants in a shared learning environment. To facilitate this, in addition to the Center's academic and cultural programs, students organize presentations, fairs and other "happenings" and invite other classes. Classes participate in holidays and special events in program-wide English language celebrations. Students can also attend additional conversation clubs, learning workshops, a MakerSpace[1], and more.

As part of learners' progress evaluation throughout the course, teachers not only assess students, but provide action plans to help them improve. Notwithstanding, action plans are not completely effective as sometimes follow-up with students indicates little or no improvement. When a teacher feels that a student may be trying but is not ready to move on to the next course, the student is offered additional tutoring sessions. As discussed earlier, these sessions currently offer standardized learning strategies to small groups of students whose problems may indeed be varied. Most of the strategies featured in tutoring are the same used in regular classes but in a more explicit way. After eight tutoring sessions, the teacher and the tutor discuss the student's progress to decide if the learner continues to the next course, and if a second round of tutoring sessions during the next cycle of classes is needed.

Diagnostic information collected from artifacts, documents, and informal interviews with tutors prior to this intervention suggest that FLLD students' progress in tutoring is limited. Tutors attribute this to learners' lack of awareness about their weaknesses and lack of knowledge about and skill using learning strategies. Further, tutors venture that most tutees are not receiving the constant support in class that they need. In other words, students with FLLD in the program most likely retain those difficulties. For this reason, the actions in this study took place in the regular classroom, not in the tutoring service. Further, as the literature review suggests, the strategies are beneficial to all students, not just students with

[1] MakerSpace is an area to explore, learn, and interact with different materials and tools with the aim of developing creativity and innovation while practicing English.

difficulties. Prior written authorization was sought and obtained from the Center to carry out the study.

PARTICIPANTS

The participants in this study were adults aged 18 to 60 who were taking the first three levels of the Basic Block of courses at the Centro Colombo Americano, with the proposed outcome of an A1 level, according to the CEFR (Council of Europe, 2018). Most of the students in the study were either high school graduates or professionals who sought new opportunities by learning English as a foreign language. These students' main motivation for studying a foreign language included traveling, finding a new job or position, helping their children with English at home, graduating from college or postgraduate studies, and/or personal satisfaction.

This study featured control and experimental groups in the third level of the 18-level program. An experimental group is understood as the students who receive direct intervention from the researcher and are exposed to changes (Bailey, 2008). The control group learners are not intervened, but results (behaviors, performance, accomplishment) are compared to see the level of effectiveness of the pedagogical intervention or experiment (Hinkelmann & Kempthorne, 2008). In this particular study, the experimental group was made up of eight FLLD students and seven non-FLLD learners, contrasted with the control group of 11 students. Although the control group had fewer participants, it presented similar characteristics (four FLLD learners and seven non-FLLD), but did not receive the pedagogical intervention. Permission from the participants was sought and obtained, and parents' permission was obtained for minors.

DATA COLLECTION INSTRUMENTS

The research questions of this study were addressed through the implementation of pre/post questionnaires and pre-/post-tests in both the experimental and the control group, and observation only of the experimental group.

Pre- and post- questionnaires. As discussed in the literature review, learners' individual difference variables are found to influence students' learning; therefore, they cannot be disregarded. With the implementation of the mixed method (S^2R + MSL) positive belief holding, self-confidence experience, and success encounters were evaluated since these are factors that the intervention attempted to activate. With the purpose of analyzing the emotional factors that underlay students' difficulties and their progress, two structured and numerical questionnaires were used. The pre-intervention questionnaire was designed to explore students' experiences, attitude, use of strategies, motivation, external factors, expectations, and their own knowledge of strengths and weaknesses that affect their learning

of English. The questions were in Spanish in order to convey a clear message and encourage students' self-confidence when answering.

Additionally, the post-intervention questionnaire was applied to all students including the control group to understand how learners' emotions were affected, and if there was any meaningful change in their individual difference variables (Ganschow & Sparks, 2001). These artifacts generated patterns to organize the information quantitatively (Cohen, et al., 2007).

Observation. What happens in the classroom is a naturally occurring social situation that includes the physical, human, interactional, and program settings (Morrison, as cited in Cohen et al., 2007). As such, during the intervention, the teacher-researcher registered students' learning behaviors through direct observation and analysis. Students' learning difficulties were evaluated in terms of incidence, presence, and frequency. The teacher-researcher gathered the information from the unstructured observations into journals divided into 15 boxes, corresponding to each student. Each time students were asked to produce in English, they were carefully observed and described in the journals following a color coding: green referred to big steps students took towards improvement, red represented their mistakes, and blue identified the things they continued doing the same way, but that represented no danger for their learning.

In total, five journals were collected. At the end of every unit, according to the Center's program, students were evaluated by presenting a task in which they had the opportunity to demonstrate what they had learned in a natural and spontaneous fashion. The journals were compared to see the process of both FLLD and non-FLLD students in terms of output, autonomous use of strategies, grasp of information, and individual differences. Through this tool, the researcher was able to record students' behavior in both the control and experimental groups.

Pre- and post-tests. In order to gauge students' language performance, the teacher-researcher produced a pre-test, intended as a diagnostic test to evaluate students' proficiency before the intervention took place, and a post-test or summative test that measured students' achievement at the end. The pre-test and post-test contained eight items with similar content, yet different wording. Both tests were the same for the experimental and control group, and the same level of difficulty. The content of the tests sought to diagnose difficulties in English language proficiency, in reference to accurate overall written production, demonstrating an A1-Basic user level according to the CEFR (Council of Europe, 2019).

General instructions on how to take the test were given in Spanish orally and in writing, and it was intended that students took roughly one hour to finish. Scoring took into account spelling, grammar, vocabulary retrieval, accurate communication of ideas, word range. The researcher also recorded each students' time needed to take the test.

PEDAGOGICAL INTERVENTION

This study intended to analyze the effects of Strategic Self-Regulation (S^2R) and Multisensory Structured Language on both FLLD and non-FLLD students. Two classes of the third level of the program participated in this study: an experimental group of 15 students and a control group of 11. The experimental group was taught using Strategic Self-Regulation and Multisensory Structured Language strategies as depicted in the following figure:

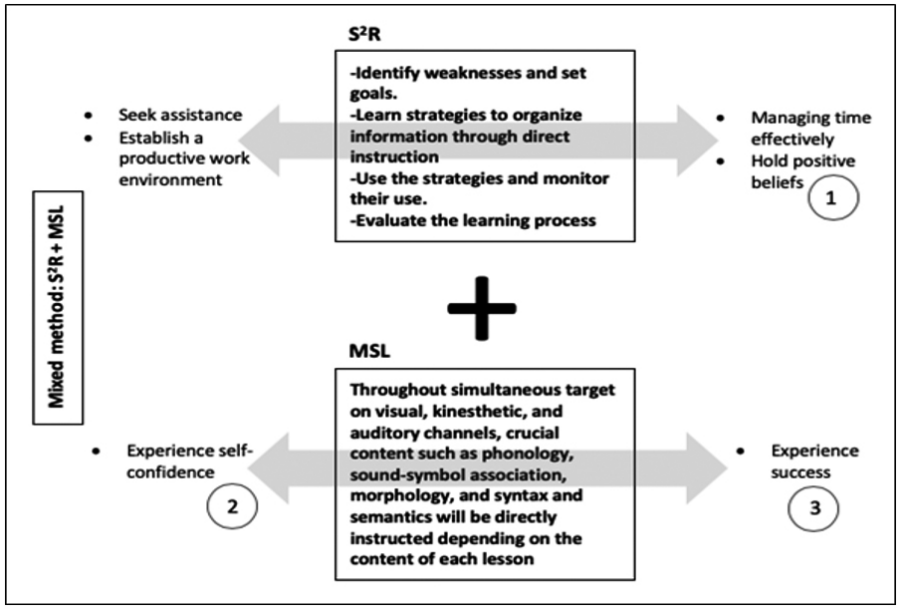

Figure 1. The mixed method and individual difference variables

Figure 1 illustrates the mixed method for integrating strategies to aid students in self-regulation and control of their learning process (S^2R) with direct instruction of language content through multisensory channels (visual, kinesthetic and auditory). During the process of implementing these interventions, student differences in terms of other variables were taken into account in order to guarantee the success of the method (Numbers 1, 2 and 3), while basic conditions for the entire intervention – students and teachers who are willing to seek and give assistance as well as establish a productive work environment -- are mentioned in the upper left-hand corner.

The intervention involved changing the way content is taught by means of direct and explicit visual, kinesthetic, and auditory channels during instruction (MSL), and also emphasis on strategic self-regulation. Specifically, students received explicit instruction

on basic and useful strategies to organize information and grasp features of phonology, morphology, syntax and semantics of English. Both the researcher and learners monitored the use of the strategies to see the effectiveness. The S^2R method was intended to help students acquire positive beliefs due to the organization and assessment of the learning process (Oxford, 2013), and it was hoped that the MSL method might help students increase self-confidence and success (Birsh, 2011). These emotional factors play an important role in addressing individual difference variables in relation to the main patterns observed in FLLD learners.

The teacher-researcher used the content of the course to present strategies explicitly in Spanish as a way to ensure understanding and importance in their learning process. Apart from teaching the strategies in students' mother tongue, the teacher-researcher modeled them through auditory, visual and kinesthetic channels simultaneously. Although the intervention lasted the 19-day course, there were eight moments of direct instruction with strategies that varied in terms of language ability addressed, and the content and material used. Most of the strategies can be found in Oxford (1990), and were implemented in the following order:

Table 1. Strategies used in the intervention

Strategy	Description	Implementation
Labeling	Or *associating*, is part of the direct-memory strategies of creating mental linkages (Oxford, 1990, p. 60). Labeling was used to tag vocabulary to be remembered.	Used to teach vocabulary about clothes and accessories. For the visual channel, students labelled vocabulary on pictures of people wearing clothing. The kinesthetic channel featured students as the two models, and other students were asked to scotch tape the correct vocabulary on their classmates' clothing. For the auditory channel, students listened to the pronunciation of the words and connected with similar words they knew.
Analyzing a Grammar Chart	From the group of direct-cognitive strategies (Oxford, 1990, p. 64), this technique helps students identify commonalities in unanalyzed patterns in order to understand grammar components.	Learners looked at the grammar chart given in the textbook to identify the elements of the modal verb "can." Students had to select these elements pictured in big strips of paper from elements that did not belong to the structure. Kinesthetic, visual and auditory channels were activated since students had to manipulate the words and place them in the correct position according to the color, type of sentence (statements and questions), and the odd ones out.
Matryoshka Strategy	This name was given to the strategy *circumlocution* or *using synonyms* from the group of direct-compensation strategies (Oxford, 1990, p. 97). The Matryoshka doll was used as a metaphor to denote a recognizable relationship of "object-within-similar-object" that describes a thing.	The Matryoshka doll was used to describe vocabulary that cannot be translated into another language, usually due to its cultural nature. Learners had to explain these words using language-based clues in English starting with the general information (category), followed by a brief description (characteristics), and finishing with something similar (synonym).

Mute Strategy	One of the direct-cognitive-practicing strategies (Oxford, 1990, p. 71), the mute strategy was created to work on the pronunciation of the regular verbs in past tense.	The strategy helped students recognize the silence or sounds in the -ed ending of past verbs. The auditory channel was activated through listening to the correct and incorrect pronunciation to spot differences while the visual channel used blurry "E" letters on the board to associate with the mute letter in the past tense ending. The kinesthetic channel asked students to touch their vocal cords to identify vibration of voiced or voiceless sounds.
Bicycle Strategy	A new analogy was created with the purpose of linking a familiar idea to the strategy following patterns which belongs to the group of direct-cognitive strategies (Oxford, 1990, p. 64). The bicycle was chosen to explain that every system has a manner to operate and cannot be changed or replaced, e.g. a bicycle has a handlebar and pedals that go in a certain part of the system and cannot be interchanged, but can be modified with the same elements with similar characteristics.	The analogy was made to English grammar: the position of a subject cannot be changed for a complement or a verb in a positive statement in simple past. Students were shown a bicycle with the names of the parts. Then they were shown the positions of statements and questions and their possible interchangeability with words of the same category. Telling the story of the bicycle and its parts activated the auditory channel, showing the colors in the bicycle parts triggered the visual input, and manipulating the strips of paper and the bicycle part focused on the kinesthetic channel. Consequently, if the bicycle has its parts correctly labeled, it can be used to move from one place to another; if a sentence has the correct structure, communication can happen.
Outlining Stories	Part of the direct-cognitive group that creates structure for input and output (Oxford, 1990, p. 89), this strategy promotes the use of different materials to represent something language.	Students had to talk about their first time doing something. They worked in groups of three and presented the information in three different ways: one person was in charge of telling an anecdote in simple past (auditory channel), another student had to draw what was being said (visual channel), and the remaining learner used modelling clay to represent the story. Students rotated to new groups to retell the anecdote.
Finger Strategy	This is a strategy that works for question structuring and organization. Akin to the Bicycle Strategy, this also belongs to direct-cognitive strategies (Oxford, 1990, p. 64).	This strategy tackled students' lack of clarity when creating questions and discriminating verb *to be* questions from simple tense questions. A right hand was drawn on the board to present the components of information questions in simple tenses; consequently, the thumb represents the Wh-word, the index finger shows the auxiliary, the middle finger interprets the subject, the ring finger is associated with the main verb, and the pinky illustrates the complement of the question. On the contrary, the left hand was designed to depict verb *to be* information questions: thumb for the Wh-word, index finger for the verb *to be*, middle finger for the subject, and ring and pinky composed the complement. Apart from having these representations in a visual input on the board, students were asked to label their real fingers writing on them to have a kinesthetic experience. Finally, the auditory intake was addressed by repeating the formulas.
Classifying	This strategy makes part of the direct-cognitive-memory group in charge of creating mental linkages (Oxford, 1990, p. 58). This strategy was used with quantifiers: *many, much, a, an, a lot of, some, any*; and the questions with *how much* and *how many*.	Students received input from a video, a grammar chart, and a conversation. Learners were asked to analyze the grammar content to be organized in countable or uncountable nouns; and affirmative, negative, questions for offers, and questions for requests. The visual channel was activated by colors and the mental image that the diagram created, the kinesthetic input was favored through the manual classification of the words in a Venn diagram on the floor, and the auditory route was assisted with a chain of words.

DATA ANALYSIS AND INTERPRETATION

Data collected from the pre- and post-tests and the pre- and post-questionnaires were analyzed and contrasted with the unstructured observation information collected in the journals. Content analysis to gather the vast information and scale it down to the most crucial aspects helped the researcher answer the research questions and draw conclusions. As Cohen, et. al. (2007) describe, "Content analysis takes texts and analyses, reduces and interrogates them into summary form through the use of both pre-existing categories and emergent themes in order to generate or test a theory" (p. 476).

The original pre- and post-tests were graded and analyzed taking into account the following categories: spelling, syntax, vocabulary retrieval, time spent on the test, accuracy and word range. The tests were paper-based tests, and scoring involved a) color-coding for the first three categories, b) the time each student took to complete the test, c) the number of words students used to answer the written questions, and d) the accuracy of students' answers. Then, pre- and the post-test results within the experimental group were contrasted to identify any significant changes after the intervention, particularly among FLLD and non-FLLD students. Also, the outcomes of the experimental group and control group were compared in order to analyze the intervention beyond the experimental group.

This information was represented in a spreadsheet in order to express the results numerically and to generate graphs that allowed for further analysis and description. The pre and post-questionnaires data were created in Google Forms and then tabulated using spreadsheets. Multiple-choice questions generated graphs that allowed for analysis and description, finally interpretation by the researcher. At the same time, the information was integrated and triangulated to identify any individual difference variables (Ganschow & Sparks, 2001). The open-ended questions were examined to generate a qualitative interpretation based on the reduction of key elements in the data (Cohen, et. al., 2007), based on frequency, patterns, relationships between specific topics, and supported by the data on the journals. After analyzing students' answers, the following categories emerged.

Table 2. Categories of individual difference variables

Category	Description
Experience	Time and description of students' English learning experience
Attitude	Description of students' attitude when they faced the last challenge of learning English
Strategies	Students' repertoire of strategies used to learn English
Skills	Acknowledgement of the aware use of the four language skills, i.e. listening, reading, speaking, and writing, and their strengths or weaknesses in each one of them
Motivation	Absolute awareness of the stimulus that brings students into the English learning process
External factors	Importance of the components that have a great incidence in students' learning of English. Among them: the teacher, time, personal attitude, class content, knowledge of the native language rules, and extra class assignments/practice
Expectations	Feelings towards the new learning process
Strengths	Consciousness of highlights that help and favor the learning system
Weaknesses	Consciousness of pitfalls that block and cease the learning development

Similar to the pre and post-tests, outcomes in the experimental group were contrasted to the control group in order to see the impact of the intervention in terms of the strategic self-regulation S^2R and the transversal individual difference variables that affect learning.

RESULTS AND DISCUSSION

In general, the data analysis indicated a clear, positive impact of the Strategic Self-Regulation and Multisensory Structured Language strategy training, in both FLLD and non-FLLD students. Although students in both the control and experimental groups evidenced improvement in language proficiency, students in the experimental group improved more, especially in certain aspects. Similarly, FLLD students in both groups improved in language proficiency although the FLLD students in the experimental group showed markedly more improvement than those in the control group. Further, students in the experimental group were able to link the strategies to their daily oral production, and their feelings about learning English became more positive and optimistic. In addition, the identification of individual difference variables allowed the teacher to help students in the experimental group learn more effectively, particularly in terms of self-regulation and time management.

LANGUAGE PROFICIENCY

One of the purposes of this study was to see how the MSL approach to presenting learning strategies affected the language proficiency of students, particularly those with FLLD. Pre- and post-tests were carried out before and after the intervention in order to measure progression or regression in terms of written production in English.

In terms of language proficiency, as evidenced by a comparison of the pre- and post-tests, students in both the experimental and control groups evidenced clear improvement over the period of time of the study. Nevertheless, it is possible to note that students in the experimental group improved more. Further, when isolating FLLD students, it is possible to observe that learners with difficulties in the experimental group also improved markedly more than their counterparts in the control group.

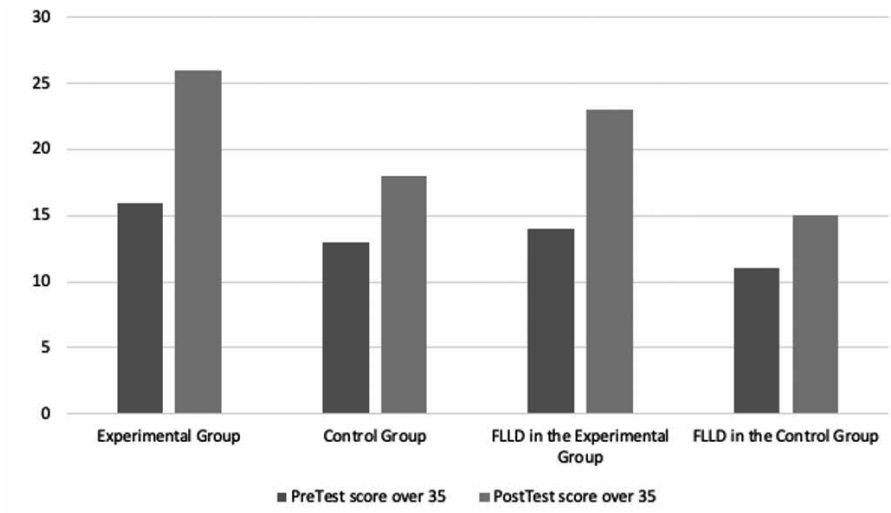

Figure 2. Comparison of pre- and post-test scores control vs. experimental groups.

As can be seen in Figure 2, both FLLD and non-FLLD students in the experimental group performed better on the pre-test than their counterparts in the control group, obtaining initial overall scores of 16/35 and 13/35 on the pre-test, compared to 14/35 and 11/35 in the control group. Although both FLLD and non-FLLD students in the experimental group began with slightly higher scores, their improvement on the post-test was markedly higher than their counterparts in the control group. Their scores improved 10 points from the pre- to the post-test, compared to 5 points for non-FLLDs and less than 5 points for FLLDs in the control group. This indicates that while the instruction provided by the same teacher-researcher to the control group can be considered effective in terms of

overall student outcomes, the additional instruction on MSL and S^2R did indeed maximize learning in the experimental group, especially of FLLD students.

STRATEGY USE

In addition to improvements in language proficiency, the study inquired as to whether students, especially FLLD students, would benefit from the strategic self-regulation and multisensory strategies, and to what degree these students might make independent use of these strategies. Examination of the data provides evidence of this and also helps to explain the possible sources of improvement in language proficiency in the experimental group.

During the intervention, the strategy of following patterns (Oxford, 1990) was implemented as a way to aid students in building complete and accurate sentences. In the data collected in the journals, it was possible to identify that students in the experimental group were able to use not only isolated words to communicate ideas, but complete sentences following a pattern (subject + verb + object + connector + subject + verb + object). This provides evidence of students' adoption of the bicycle strategy. The journals also evidenced students' oral performance and analyzed students' vocabulary recall, the construction of sentences, and accurate communication of ideas. Students were observed adopting the kinesthetic strategies to produce complete statements and questions, for example using their fingers to count off the elements needed to create information or yes/no questions.

Another example of autonomous use of strategies was present at the moment of explaining words in English since students were not allowed to use Spanish for this purpose. Food lexicon provided a good opportunity for learners to use the Matryoshka strategy as in the example, "*Shellfish is a kind of seafood. You can eat in plates like* paella *or* cazuela. *It's kind of like animals of the sea in your lunch.*"

Data from the journals confirmed that FLLD students in the experimental group also used a wide range of strategies to solve specific oral tasks. The most evident strategies were analyzing a grammar chart, the Matryoshka strategy, the bicycle strategy, and the finger strategy. Although there was no direct evidence of analyzing grammar charts during communicative tasks, students were observed separating the parts given in sentences inside a grammar box to understand the organization. They were seen using colors in their notebooks to distinguish the components of language. Three FLLD learners created flashcards containing not only the grammar that was directly taught with the strategy (modal verb *can*) but also simple past, and grammar for offers (*would like*) and requests (*Do you have…*?) driven by their own interest.

INDIVIDUAL DIFFERENCE VARIABLES

As discussed previously, students' learning performance and/or proficiency can be determined by factors such as attitude, desire, effort towards learning, levels of anxiety, and the conscious use of learning strategies. The pre- and post-questionnaires revealed insights into these individual difference variables, showing how the pedagogical intervention not only facilitated students' oral and written production in class, but also clearly and positively influenced the internal and individual factors and their impact on learning.

Experience. After the intervention, students reported having a better experience in comparison to previous EFL encounters since most of them (11 out of 15 in the experimental group) reported having negative learning experiences previously. According to data, nine students in the experimental group rated the class as "better than my prior experience," and used words like *motivating* and *calm* to describe it.

Attitude. Holding positive beliefs refers to the ability to control one's emotions in order to identify strengths and weaknesses as opportunities to learn, not fixed characteristics (Schunk and Zimmerman, as cited in Oxford, 2013).

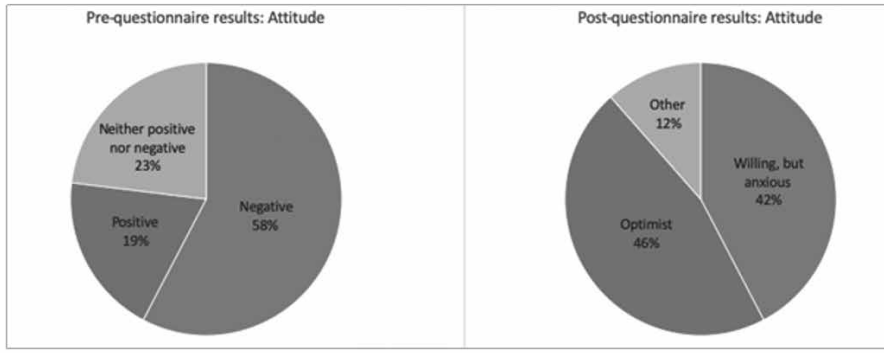

Figure 3. Comparison of attitudes towards learning on pre- and post-questionnaires

As evidenced in Figure 3, in terms of attitude, students in both the experimental and control groups reported being "optimistic" or "willing but anxious" after one month of instruction (88%), in contrast to their feelings before the intervention, which was mostly negative (58%) or neutral (23%). Journals revealed how students in the experimental group showed eagerness to continue learning through their autonomous use of learning strategies that backed them up to make changes in their learning process after receiving feedback from their peers or instructor. Students were also observed creating flashcards to keep track of their process and action plans to be implemented using the strategies.

Strategies. In terms of students' independent use of strategies, results in the post-questionnaire in the experimental group revealed that the most common strategy they used during the month was to plan their learning. Students also mentioned the use of colors to identify patterns, application of the content in real settings, and manipulation of objects to learn things. In contrast, learners in the control group referred to practice outside class as the best strategy to learn English. It is important to note that while students in the control group were indeed able to name an independent strategy, it was a more traditional option.

Indeed, integrating the information from the observation of FLLD students in the experimental group, it was evident that these learners' use of strategies went beyond completing exercises in the book or the online platform since they discovered a wide range of tools to be used to facilitate their learning process. Hence, the mixed method training helped students understand that learning English was more than acquiring a set of rules and words. It trained students to plan their learning better as they described in the post-questionnaire in an effort to overcome their struggles and have a better learning experience with positive outcomes.

Skills. The ultimate outcome of learning English in the program is to become a proficient user. In terms of improvement in specific language skills, students in the experimental and control group reported that speaking was the skill developed most during the intervention; however, the experimental group described processing and thinking in English as another skill they strengthened. This selection, beyond the typical linguistic skills, illustrates the impact of the strategy intervention on these learners.

Motivation. Preliminary data collected through the pre-questionnaires revealed that students' main motivation to learn English as a foreign language was the opportunity to travel and learn different cultures, as well as personal development. After the intervention, FLLD students in the experimental group described their motivation as having improved, owing to the fact that they could see progress in their learning. Non-FLLD students in the same group reported that their reason to keep their motivation growing was the consolidation of abilities they knew they possessed. Likewise, learners in the control group informed that their motivation improved because they knew they could perform better. Moreover, all students in the experimental group affirmed their enthusiastic feeling for future courses while the students in the control group affirmed feelings of motivation and improvement. These results point to the impact of the mixed method training on students in the experimental group since their motivation was high and they evidenced knowledge of how to actively participate in and control their own learning. Learners in the control group reported knowing that they need to improve due to information they had received in regular feedback sessions with the instructor, but disregarded any actions they could take to boost their learning process.

External factors. In terms of other factors that impact learning and motivation, both FLLD and non-FLLD students mentioned the instructor, the learned and used learning strategies, dedication to the learning process, time spent learning outside class, extra activities such as the online platform and class preparation, and the contents of the class.

Interestingly, FLLD students in the experimental group expressed that learning strategies and their own dedication were the most crucial factors for their learning process. Non-FLLD students in the same group also mentioned the importance of learning strategies and their own dedication, but they also gave high importance to the instructor. On the other hand, students in the control group considered that the most decisive factor to learn English is the teacher, but the contents of the class were the least important. This contrast indicates that students who received training on the mixed method were aware of their own responsibility for the learning process and their ability to take control of it.

Expectations. As the intervention in this study constituted an innovation in the program, the students in both groups could not be expected to receive the same strategy instruction as they move on to new instructors. For this reason, students were asked to describe their behavior in future classes. The experimental group insisted on the need to remain conscious of their learning process to use strategies effectively. The control group learners pointed to the importance of keeping a positive attitude, knowing that they can achieve the goals, and also mentioned that the type of contents would be important. A few also reported the need for study habits. Both FLLD and non-FLLD students in the experimental group clearly understood the importance of choosing appropriate strategies for the purpose and situation, indicating a clear awareness of the importance of the intervention they received.

Strengths and weaknesses. When students are exposed to a learning environment that allows them evaluate and identify their successes and pitfalls, they become active learners that control what and how the content is grasped, and their learning experience results pleasant and rewarding. All students in the experimental group were asked to write down their strengths and weaknesses as part of introducing the intervention. They indicated that being committed and taking risk were their strengths. However, the control group considered grammar and vocabulary as part of their virtues. It is evident that students who received the training took into account who they are as learners and not only what they know, which essentially reflects an understanding of what it means to be self-regulated learners. Their weaknesses varied from memory to lack of vocabulary to express their ideas accurately in oral or written fashions. However, information obtained from observation demonstrated that although some learners in the experimental group did not always remember words, they were able to use strategies to fill that gap and prevent breakdowns in communication.

CONCLUSIONS

With the implementation of the mixed method training that merged strategic self-regulation (S^2R) and multisensory structured language (MSL) in students both with and without foreign language learning difficulties, the study looked for effects on learners' proficiency and autonomy that directly affected individual difference variables, including attitude, desire, anxiety, and conscious use of learning strategies. Results indicate that while all students in the study, both control and experimental groups, improved in language proficiency, students in the experimental group showed more improvement. Students with FLLD in the experimental group showed even more marked improvement when compared with FLLD students in the control group. Further, individual learner variables of students in the experimental group were more strongly and positively impacted by the strategy intervention than those in the control group. Although both groups maintained positive attitudes about future courses, students in the experimental group explicitly named strategies, attitudes and behaviors they had been taught during the intervention as important for future success.

Comparing the results obtained in this study to the studies reviewed, it was possible to identify several similarities. For instance, in this study, students had a more active role in managing and controlling the learning process by means of identifying their weaknesses and strengths, setting goals, using the learning strategies autonomously, and evaluating the learning process; furthermore, they exhibited better academic performance. This goes along with the work done recently by the U.S. Department of Education (2017), which affirms to have impacted pupils' academic skills since students became more conscious of what and how they were learning. Similarly, Mourad (2009) revealed that strategic self-regulation aided the development of writing skills in underachievers. This can be directly compared to the written and oral production generated by the students of this study, which improved notably from the pre- to the post-test and in their communicative tasks in class as well.

The individual difference variables addressed during the implementation aimed to promote positive beliefs, and experiences self-confidence and success. Results demonstrated that individual difference variables such as attitude, expectation, motivation, and conscious use of learning strategies were positive and effectively addressed towards a successful learning experience as students stated in the post-questionnaires. Nicol and Macfarlane-Dick (2006) also focused on behavioral, motivational, and cognitive aspects of self-regulation, demonstrating that learning could be accelerated by S^2R since students have the opportunity to regulate their own learning to keep positive beliefs and experience success. These findings confirm Oxford (2013) that learners supported by teachers play a much more active role in maximizing and controlling the learning process, thereby maximizing the learning outcomes.

This study also demonstrated that multisensory structured language (MSL) was effective to improve memory and learning, and was also emotionally sound since students experience success, self-confidence, and skill development (Birsh, 2011). Both FLLD and

non-FLLD students were able to approach strategies and content through three simultaneous channels to stimulate a wider range of input receptors, depending on their learning style. Similarly, Sparks and Miller (2000) boosted underachievers' oral and written performance in native and foreign language without altering the curriculum; however, they did not use the MSL techniques, just explicit content. Equally, Schneider and Evers (2009) and Jubran (2012) helped secondary school learners execute tasks related to pronunciation, reading, grammar, vocabulary, and spelling, but they found that these MSL techniques needed to be explicitly taught to students to develop autonomy and self-regulation. In this way, the present study went beyond others by mixing MSL with S^2R.

In a comparative study by Sparks, et al. (1998), they demonstrated the positive effects of MSL training on FLLD learners compared to non-FLLD students, who did not receive any training on MSL. Similarly, the students in the present research who participated in the implementation of the mixed method training showed improvement in terms of written and oral production while learners who continued with the traditional teaching style of the institution did not reveal the same results. In agreement with Jubran (2012), multisensory structured language is a tremendous technique to maintain learners engaged and focused, even more so when they know why they are learning, how they can apply it and the learning/production circumstances where they can use it.

Despite the fact that there were no published studies that mixed multisensory structured learning with self-regulation, this study exhibited the strengths of the mixed method training (MSL + S^2R) in terms of applicability in the institution's program, its possible integration to the curriculum, its strong connection with the formative assessment program of the language center, and the creation of physical or digital didactic material.

ACTION PLAN

- Teachers should use multisensory structured language (MSL) when planning to teach new and relevant content to address visual, tactile and auditory learners.
- Implement strategic self-regulation in the formative assessment approach by instructors as a way to make learning visible for students and really turn the learner's responsibility to the active role it deserves.
- Teachers may avoid sending at-risk students to tutoring sessions as the only resource to overcome difficulties. Tutoring sessions could be the second step after students learn how to be self-regulated.
- Instructors should communicate with each other to inform the process that has been happening with any at-risk student, so they keep the thread of developing autonomy and self-regulation in students.

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CHAPTER 3

THE EFFECT OF TRANSLATION STRATEGIES ON THE ACQUISITION AND RETENTION OF ENGLISH VOCABULARY IN SECOND AND THIRD GRADE STUDENTS

CAMILO ALBERTO CARDONA LOZANO

The use of students' first language is discouraged in many foreign language classrooms, and even forbidden in some international and bilingual schools and institutions in Colombia. However, in many schools, as in the Colegio Anexo San Francisco de Asis *in Bogotá, English is an extra class of one or two hours per week. In this context, Spanish, children's first language, is used constantly, even in English class. Teacher researcher Camilo Cardona posited that intentional and supportive use of students' mother tongue in the English classroom could have possible benefits, particularly as an aid to learning new vocabulary and retaining these words later. The translation strategies explicitly taught to students in this action research project yielded quite positive results in terms of acquisition and retention of vocabulary as well as in students' awareness of the usefulness of these strategies.*

ABSTRACT

The purpose of this action research project was to inquire as to the effect of translation strategies in the classroom using Spanish, the mother tongue, on the acquisition and retention of English language vocabulary in second and third grade students. This research took place in a school in the north of Bogotá in the years 2016-2017. Two groups of students, second and third grade, were part of this research study, 27 individuals from six to nine years old, in each class. The teacher/researcher guided students through a process of vocabulary learning using an action research approach. The intervention involved translation strategies, specifically *cognates, dictionary,* and *glossaries* to investigate their impact on learners' learning of vocabulary. Findings demonstrate clear improvement in vocabulary acquisition and retention by these learners, who used the techniques. Additionally, students interviewed were found to have a clear awareness of the strategies and their use as an aid and the ways in which some strategies work best in certain situations and conditions.

Key words: Translation strategies, First language use, Vocabulary learning, Vocabulary retention

RESUMEN

El propósito de este proyecto de investigación acción fue indagar sobre el efecto de las estrategias de traducción en el aula utilizando la lengua materna en la adquisición y retención de vocabulario del idioma inglés en los estudiantes de segundo y tercer grado. Esta investigación se llevó a cabo en una escuela en el norte de Bogotá. Dos grupos de estudiantes, segundo y tercer grado, fueron parte de este estudio; 27 individuos de 6 a 9 años de edad, en cada clase. El profesor / investigador guió a los estudiantes a través de un proceso de aprendizaje principalmente de vocabulario mediante el uso de un enfoque de investigación de acción. La intervención incluyó algunas estrategias de traducción, que incluyen cognados, diccionario bilingüe y glosarios para investigar su impacto en el aprendizaje del vocabulario de los estudiantes. Los resultados demostraron una mejoría clara al usar estas técnicas con un mejor efecto en ciertas situaciones y condiciones. Además, se encontró que los estudiantes entrevistados tenían una clara noción de las estrategias y su uso como ayuda para aprender vocabulario.

Palabras clave: Estrategias de traducción, Uso de la lengua materna, Aprendizaje de nuevo vocabulario, Retención de vocabulario

Translation is often used to teach vocabulary because for children it may be simpler and faster than other techniques. It has been argued that translation is in fact as important as images, context, or synonyms to aid in understanding of meaning. Users of a foreign language need to have a reference in their first language (L1), and this is where translation plays an important role. Students usually acquire words by relating them to their L1. Otherwise, it is often difficult to retain vocabulary. In terms of vocabulary teaching, most scholars argue that vocabulary should be taught in several ways as each individual student learns differently. Further, it is argued that translation is an effective aid when learning vocabulary, but that it needs to be used along with other techniques such as images and synonyms in the second language (L2).

There is no theoretical reason why translation cannot be used in bilingual classrooms. Still, it is maintained that many teachers overuse translation as the only strategy to provide comprehensible input. Other reasons for avoiding translation in the classroom include teachers' fear of a balanced use of languages in class, and preference for focusing on students' L2 production. Indeed, many teachers may underestimate translation and avoid its use, even at appropriate times and in ways that are helpful to learners. Advocates of measured use of translation argue that words should be translated by chunks rather than translating literally, word by word. Translation not only has to do with reception of vocabulary; in fact, it has to do with the four skills, and helping create opportunities for students to produce the language.

Even though research exists on the benefits of translation, few studies focus on precise strategies or their impact on student learning. Further, translation studies tend to be focused on older learners, not on young children. For this reason, it was found interesting to discover the effect of particular translation strategies on vocabulary learning, in terms of acquisition of new words and retention of new and old words. Some of these strategies may work, some might be difficult to teach and use, and others may not yield the expected results.

After reviewing the research on translation, the following study was developed and implemented in a private school in the north of Bogota. The population for the intervention were students from second and third grade, between 6 to 8 years old. The study focused on three translation strategies: *cognates, glossary*, and *bilingual dictionary*. They were used in order to expand the acquisition and retention of vocabulary featured in different situational and lexically organized topics. A pre- and post-test were applied to find out the impact of these strategies. Additionally, students' attitudes about the activities and strategies were observed and analyzed.

Findings demonstrate that these strategies helped learners to improve their ability to acquire and retain new words. Secondly, cognates, glossaries, and the use of the dictionary appear to work differently with diverse ages and have diverse effects. Finally, students reported feeling comfortable using these techniques. They felt activities were easier, and their motivation towards and awareness of the strategies could be observed by their testimonies.

LITERATURE REVIEW

Bilingual strategies are used in classrooms daily to increase the quantity of vocabulary. These include different uses of translation and the first language, both of which have sometimes been rejected for various reasons. However, there are studies that support using the L1 and translation in class as these tools make learning easier, more meaningful, and students feel comfortable with their use.

THE USE OF TRANSLATION

Some studies have looked at the use of translation for different purposes. For example, Hummel (2010) looked at French students in an English teaching program. He was concerned about the role of active translation and its effect on L2 vocabulary learning. Hummel compared results on three different tasks. It was theorized that the greater retention of previously unknown L2 words would be the result of the active translation use. After the three types of practice, learners increased vocabulary recall. Findings showed that although active translation did not lead to better retention, due to a need for higher student concentration, it did benefit learners on active translation of sentences. Hummel hypothesized that students would benefit more from exposure to new vocabulary supported by equivalent translations.

Asiyaban and Bagheri (2012) also focused their study on analyzing the effect of translation on vocabulary. This experimental study was developed with Iranian students of English in a language institute. Researchers were interested in discovering the impact of using translation techniques in vocabulary teaching and whether this had a positive effect on learners' vocabulary. Findings show that translation helps learners have quicker access to more than a definition in the target language. Further, the study indicates that first language equivalents have an important impact on turning them into free active vocabulary, which helps to improve pupils' proficiency.

Pakzadian (2012) explored whether translation of new English words in passages makes any substantial difference compared to paraphrasing in intermediate proficiency level students. Pakzadian also intended to examine how these strategies, translation and paraphrasing, affect learners' reading comprehension. Pakzadian determined that there was no significant alteration between the comprehension of those who received Persian translation of new vocabulary, those who dealt with the paraphrase of the same new words, and those who did not receive any L1 translation or paraphrase. Furthermore, results on a vocabulary test indicated that those who received the mother tongue definitions in front of each new word in the passage did perform considerably better on the vocabulary test than the other two groups.

Sieh (2008) studied the effect of L1 translation on elementary students' recall and retention of vocabulary. This experimental study examined fourth grade students in a storytelling program in Taiwan. The first group was taught only in L2 whereas the experimental group was provided L1 (Chinese) translation to the L2 lexicon. The second group learned and retained more new words, signifying that first language contributed to foreign language (FL) vocabulary learning. Moreover, the group produced shorter reaction times than the control group, who used pictures. Furthermore, the interviews, which took place after the online assessments, showed that both groups had employed L1 translation to access English word meanings.

Additionally, Asgarian and Musayeva (2014) attempted to explore the use of translation strategies, related beliefs, and academic achievement. Participants in this study were undergraduate students at an Iranian University. This study was developed through questionnaires, interviews, and surveys. Results revealed that beliefs about translation in L2, and use of translation strategies had a negative effect. However, awareness of the effects of L1 in L2 had a positive effect with the translation majors' academic achievement. Moreover, findings demonstrated that only some students kept L1 out of mind while others felt pressure and became anxious when thinking in L2, which indicates that they might experience a higher cognitive load.

In contrast, Alroe and Reinders (2015) researched about the purpose of learning new English words via translation from the mother tongue rather than using L2 context. The population chosen for this investigation were EFL students in Thailand. Results showed that the learners who learned via translation did not perform better than the two groups who learned contextually. These findings do not support the contention that switching to L1 in EFL classes to introduce new vocabulary is justified.

Translation and skill performance. In addition to the impact of translation on vocabulary retention, other studies look at the relationship between the four skills and translation. Puzio, Keyes, Cole, and Jimenez (2013) worked with 7th grade Spanish speaking students in the United States in order to look at the effect of collaborative translation on bilingual reading skills. The study revealed that collaborative translation is a promising and differentiated way for educators to support the reading of bilingual and emerging bilingual students. Students in the study had rich and sophisticated discussions about words, syntax, grammar, and themes.

In terms of listening, Shabani and Jalali (2015) investigated the use of translation tasks in the target language on listening ability. The study was carried out with intermediate level students because low level learners might struggle with strategies and proficiency. Findings shed light on the process of listening comprehension because they demonstrate the importance of meaning and understanding on this skill. Researchers found that students' listening understanding of the foreign language was considerably affected by the translation strategy.

THE ROLE OF THE FIRST LANGUAGE

The use of the mother tongue is a subject of controversy in language teaching, and it is common to think that avoiding L1 will contribute to L2 learners' exposure. Salmona (2014) conducted an experimental intervention to determine the importance of developing both the L1 and L2 simultaneously. In addition, Salmona tried to identify whether use of the mother tongue in the classroom increases comprehension and simplifies second language acquisition practice. This study was conducted with kindergarten students, attending their first year of school. Results confirmed Cummins' theory of underlying language proficiency:

> The development of the first language during the first year of fact, the theory suggests that even if the two languages are visually different, they do operate through the same processing system. In all learning situations, previous knowledge is a starting point for acquiring a new language. (Cummins, as cited in Salmona, 2014)

These findings confirm that learners benefit from the use of their mother tongue in the classroom, moving concepts from their first language to the new language.

Cuartas (2013) reported the results of an action research project that examined the possibility of improving students' L2 learning processes through the appropriate use of their first language with the purpose of changing attitudes towards learning English in the ninth-grade classroom. Findings revealed that the mother tongue has an essential role in learners' English learning by fostering students' affective, motivational, cognitive, and attitudinal aspects. Furthermore, more advances are evidenced in learning the target language when supported by selective use of aids in the mother tongue. In fact, it was demonstrated that the use of L1 increased students' confidence to face L2.

Similarly, Ada and Baker (2001) give the example of a school in Canada in which students were learning French as a second language. Teachers focused on students' listening and understanding abilities and classes were about content, not the use of language itself. Students were allowed to use English to communicate with their classmates but also with their teacher and also were allowed to transfer the unknown vocabulary to the L1. Students were routinely given the freedom to use the mother tongue in order to avoid negative attitudes towards speaking the L2. Researchers advocate the need for the teacher to know students' comprehension level, and to take into account students' age as well as the appropriate use of vocabulary. Teachers can then gradually increase the quantity of vocabulary with the help of L1. Once students have acquired a higher level of proficiency, they will not depend on L1 as much as beginners.

In a related study, Higareda, López, and Mugford (2009) explored teachers' motivation to use Spanish as L1 in TEFL classes at a Mexican University. Researchers were interested in examining how new language teachers use Spanish, not only as a pedagogical tool but also to develop and reinforce interpersonal relationships in the language classroom. This new generation of educators appeared to take a much more pragmatic method towards the use of L1. Results indicated that teachers need to construct a relationship with their pupils,

and this can be perfectly done in their mother tongue, especially at beginner levels. They want to be able to express interpersonal awareness and solidarity with their learners so that they feel comfortable. Nevertheless, there is a possible danger of using L1 indiscriminately, so teachers need to adopt a principled approach to the practice of Spanish in the classroom. In spite of generally positive findings, no studies surveyed detailed precise translation strategies to use in the classroom, nor were any inventories of researched strategies found.

METHODOLOGY

CONTEXT

This study was conducted in the *Colegio Anexo San Francisco de Asis*, a private school in the northeast of Bogotá, Colombia. The school is run by a religious foundation with donations by sponsors to benefit low-income students. Learners receive three academic hours of English per week. There is only one full-time English teacher, who is responsible for secondary and high school. As such, English classes in preschool and elementary grades are taught by student teachers, who are in charge of groups for one year. This means that every year, the students change teachers. There is no fixed curriculum nor defined learning goals, and instructional planning and decisions are at the discretion of these university practitioners.

PARTICIPANTS

The participants for this study were in second and third grade. They were from six to eleven years old, with 26 to 30 students in each grade. The researcher in this case was also an active participant of this project. As an insider, he was able to discern learners' behavior and develop a more informal and closer relationship with those that are observed, which can create a more natural environment (Cohen, Manion & Morrison, 2007, p. 260).

In terms of students' knowledge of English and vocabulary knowledge, diagnostic inquiry carried out at the beginning of the study revealed that students generally have a very limited active vocabulary. Further, it is unclear how long participants had received English classes previously. Teachers reported that sometimes students have English classes, but other times they do not due to a lack of student teachers at the school to assume this task. This might have created obstacles to their learning.

DATA COLLECTION INSTRUMENTS

In order to answer the proposed research questions, the following data collection instruments were used:

Vocabulary pre- and post-test. These two tests intended to establish students' level of English language vocabulary in reference to the proposed plan of study for first and second grade that was designed by two student teachers and a lead teacher at the school. Specifically, the pre- and post-vocabulary tests were designed and applied in order to establish a baseline description of students' vocabulary knowledge before the intervention, and again after the use of the proposed translation strategies in order to examine their effect on students' vocabulary acquisition and retention.

The vocabulary topics or lexical sets measured on the pre-test tests included *personal information, animals, parts of the house, sizes, numbers*, and *shapes*. It was supposed that students were familiar with this vocabulary as these were the topics taught in previous years, according to the proposed curriculum and information obtained from the two previous teachers. Vocabulary topics measured on the post-tests also included *food* and *habitats* for second grade and *professions* and *clothes* for third grade, plus the previous topics. This was intended to measure any gains in terms of retention of the basic vocabulary from previous grades, as well as acquisition and retention of the new vocabulary covered in the current school year (See Appendix).

Hughes (2003) describes test creation to measure learners' ability in a specific language, and the content of the pre- and post-test were based on what participants were expected to be able to do in terms of language and abilities. As Hughes proposes, specifications for the test were designed that determined the purpose, scope, possible content, sections, item types, and sampled content to be tested according to the proposed curriculum as documented by the teacher-researcher. Specifically, this vocabulary test was divided into five sections, with 35 points total, and applied to second and third grades. In terms of validity, it was designed with the purpose of measuring what students have seen in their years of school, what they are supposed to know at this age, according to the school's proposed program, and it only tested vocabulary.

In terms of the design of both the pre- and post-test, the first section was matching, and was intended to recognize the relationship between words and images from different themes. The second section featured labelling problems, in which learners were asked to write the word according to images provided, (e. g. Image of a nose, they write below the image the word *nose*). In the TRUE/FALSE or YES/NO items, the third section, learners were asked to use the vocabulary in order to determine the veracity of a simple statement, (e.g. Doctors work in the supermarket. YES / **NO**). It is not usually applied for formal tests, but in this case it was appropriately used in order to find out which statements and vocabulary learners were able to recognize. The last section included open questions in which learners were asked to read and provide a written answer for simple questions based on course content (e.g. What is your favorite color? *blue/ It is blue*). This intended to

measure to what extent learners could understand and use vocabulary in a grammatical and situational context, for example, in simple communicative statements (See Appendix).

Post-intervention interviews. After the intervention, the teacher-researcher carried out short interviews in Spanish with second and third graders. The purpose with these interviews was to know how learners felt with the different activities used in classes, to and take notes of the comments that they were able to give about the different strategies. It was also intended to establish the direct significance of the use of strategies in student learning. The interview questions included the following:

1. *Do you like English? Yes/ No, why?*
2. *How do you feel with the English language you know?*
3. *If you see a new word what could you do to know its meaning?*
4. *Which strategies can you use to know the meaning of a word?*
5. *Do you feel better working with which strategy?*
6. *Which strategy was the easiest and most difficult for you?*
7. *Which activity did you feel more comfortable with?*
8. *In which activity did you feel more difficulty to work on?*

Reflective journal. The teacher-researcher in this study also kept a reflective research journal throughout the implementation with the purpose of observing group behavior and performance. Important data, such as students' questions, motivation, opinions, and attitudes toward activities and strategies were recorded. Moreover, while learners were using the strategies, the teacher asked questions and wrote learners' responses in the reflective journal.

PEDAGOGICAL INTERVENTION

This study implemented translation strategies in lesson plans designed for this purpose in order to improve students' acquisition and retention of new vocabulary in English for a period of two months. After the pre-test to measure the students' level of vocabulary, the teacher-researcher began introducing strategies as an integral component of the lesson. He modeled their use and purpose, connecting them with the different topics that were scheduled to be taught. The translation strategies selected for this study were *cognates, bilingual dictionary,* and *glossary*.

Cognates were used as a first strategy because these kinds of words are usually easy to recognize. This is a perfect strategy to use with young learners since this vocabulary is not too abstract for them. These lexical items usually include objects and things that most of the time students are able to identify without difficulty. While false cognates might create confusion in terms of meaning and spelling, research has shown that recognizing and using

cognates is a vital strategy to learn vocabulary because it includes the ability to recognize similar words between the two languages (Graves, August & Mancilla, 2013). Therefore, the vocabulary presented using cognates was usually about objects or things that are easy to represent or imagine so as to not create confusion. Specifically, this strategy was introduced and used with the units on *food* and *habitats* for second grade and *professions* and *clothes* for third grade.

The second strategy was the use of a bilingual dictionary. "Research shows that learners who use a dictionary learn more vocabulary than those who rely on guessing from context and that learners who use a bilingual dictionary actually remember vocabulary better than those using a monolingual dictionary" (Folse, 2004, p. 8). As Folse argues, the use of the bilingual dictionary can improve word learning and retention. Therefore, this strategy was implemented for analyzing this theory and for improving learners' ability to use the dictionary and hence their performance. Specifically, the bilingual dictionary strategy was implemented in the units on *food* and *habitats* for second grade and *professions* and *clothes* for third grade.

The third strategy was the use of a glossary with selected words in English with their respective meaning in Spanish. It is important to clarify that this strategy was not proposed to implement the use of mother tongue in English class, but to establish references for important words in a lesson. Therefore, some words were translated for learners to be able to understand sentences, very short paragraphs, or simply words and images in context. The glossary was implemented with the units on *food* and *habitats* for second grade and *professions* and *clothes* for third grade.

These strategies were implemented intermittently, alternating these sessions with other methods in other classes to complement the learning processes, such as images, songs, and games. However, when strategies were applied the teacher-researcher usually implemented worksheets in order to make the work with strategies explicit for learners, and to provide evidence of their development in classes.

Lesson plans. Lesson plans were created in order to develop the purposes and procedure for classes with the two groups, second and third grade, handling two topics per group. It was designed with a lexical set of words for each topic, divided into cognates and words for the glossary or dictionary. These lesson plans were applied over a period of two months, and consisted of a short warm-up, and an activity usually developed through the worksheets.

DATA ANALYSIS AND INTERPRETATION

In terms of the data analysis, the following methods were applied to the different data collection instruments.

Pre- and post-test. After the pre- and post-tests were completed by students, the tests were scored. Then, the intervention took place for five weeks, followed by the post-test, which was tabulated and compared with the pre-test. This post-test was also divided into five sections but the total amount of points was a possible 40 instead of 35. To measure students' spelling abilities, three sections had 10 points as total whereas the others had just 5, which means that Sections 1 and 4 had 5 points maximum whereas Sections 2, 3, and 5 had 10. Then, the results were tabulated and graphs were generated in order to analyze and compare results for the two groups. Graphs were created with the purpose of analyzing and comparing their improvement.

Post-intervention interviews. Right after the post-test, interviews were carried out with a sample of students from each group to answer some questions about the strategies, activities and how they felt with the intervention. These interviews were recorded, transcribed, and analyzed to find similarities among learners' opinions and obtain general conclusions.

RESULTS AND DISCUSSION

After collecting and analyzing the data, it was found that implementing the three translation strategies had a positive impact on students' acquisition and retention of target vocabulary, and that using the mother tongue in class was not an obstacle to increasing learners' abilities in the foreign language. Alternating the strategies with other methods such as images or games provided a complement to their learning process as evidenced by the post-test and interviews in both grades.

Additionally, students' attitudes and motivation with the use of translation strategies were also analyzed throughout the time of the intervention and research. A research journal was used to record students' performance, behavior and the effect of the activities and strategies of each intervention. Findings demonstrate that learners did acquire vocabulary by using the three strategies. These worked differently on each topic and each grade; for instance, the bilingual dictionary was not as useful for second as it was for third grade. Also, cognates were very helpful as students were able to identify words with ease even though the possibilities of using cognates were sometimes limited by the topic. In general terms, students demonstrated mastery of much of the new vocabulary they learned with the strategies plus the old vocabulary already included on the pre-test.

Regarding their attitude and motivation to each strategy, learners showed their preferences and commented specifically about some strategies and even particular activities carried out in class using the strategies. Initially, adaptation to the different strategies was sometimes difficult as some learners did not know how to use the dictionary, and they also tended to confuse glossaries and cognates. Later, they demonstrated mastery of the strategies and could use them with ease. They completed each worksheet applying the

techniques with the specific lexical sets and topics. It was also observed that students did not go back to previous lists to check vocabulary.

ACQUISITION AND RETENTION OF NEW VOCABULARY

At the outset of this study, it was possible to observe the very strong presence of Spanish language use in English classes due to students' low language level and the customary instructional practices at the school. Students were used to using their mother tongue when asking for the meaning of words, clarification, etc. Although this might be seen as an obstacle, this study proposed the targeted use of the mother tongue with the three translation strategies. In terms of results, the pre- and post-tests demonstrated positive and significant outcomes related to new vocabulary retention. Specifically, both groups considerably improved their mastery of a larger number of words from the different topics presented during the intervention, as demonstrated by the pre- and post- test comparison.

Pre-test. As described above, the pre-test consisted of five sections that intended to measure students' recognition and contextualized use of vocabulary from key topics that they were assumed to know from previous courses. This pre-test was applied at the beginning of the semester. Results were not extremely low although second grade evidenced lower results. Figure 1 shows the scores of the pre-test by second grade students.

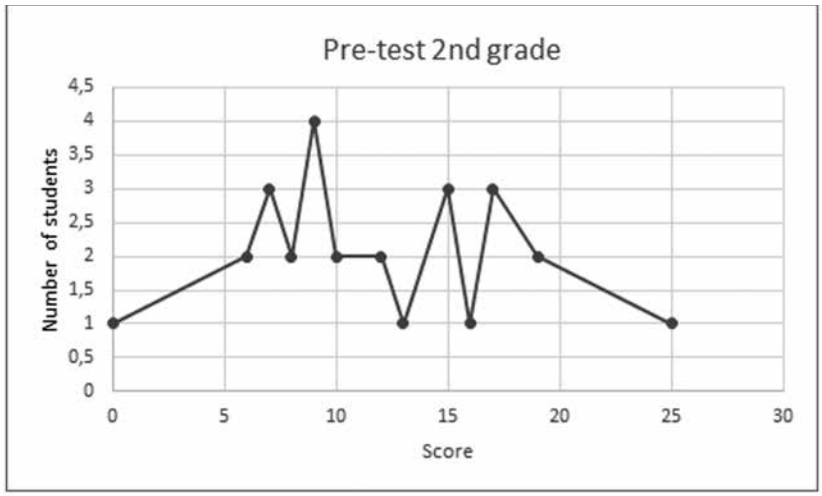

Figure 1. Pre-test results, 2nd grade

The total number of students was 27 and the total number of points on the test was a possible 35. As the graph shows, only one student received a score of 0/35 and the next

lowest 6/35. Most of the students scored between 9 and 17. Only one student obtained a score of 25, the highest score. This student mentioned she was receiving English classes out of school, which might explain her higher score. Students with lower scores tended not to complete the test, some only completing two out of the five sections in the provided time. It is also possible to observe that students performed better on Sections 1, 2 and 4 than on Sections 3 and 5.

In general terms, most of the students from second grade struggled with the pre-test. The teacher researcher observed and students reported that they felt confused, lost and that the test's sections were too challenging. This is possibly due to their lack of familiarity with the kinds of exercises presented on the exam, specifically the last section, which contained open questions and unknown vocabulary. A number of students did not answer this last point. It is also important to mention that most of the students from this group were not able to finish the test within the established time.

Figure 2 illustrates scores on the pre-test for third grade and the number of students who received each score.

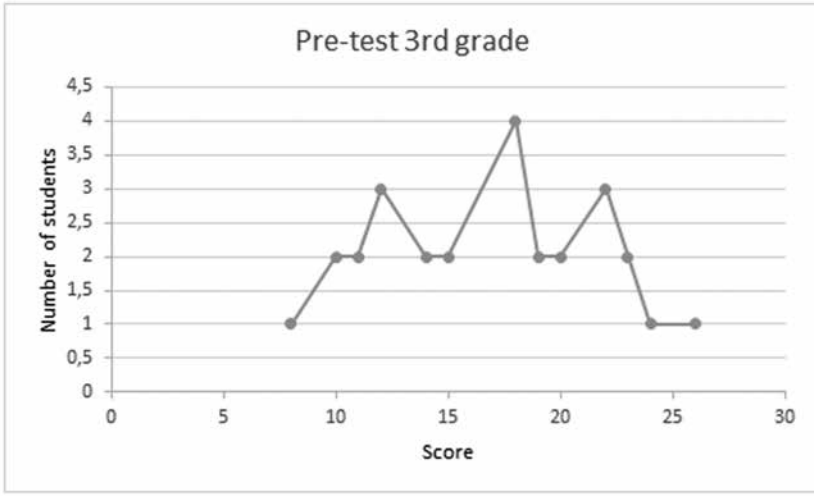

Figure 2. Pre-test results, 3rd grade

In third grade, there were 27 students and also a possible 35 points as a final score, as well. Although they performed better than second grade and some students were familiar with the vocabulary and the themes on the test, they struggled with some sections, similarly to second grade. This group of students also struggled with the open questions, which were related to personal information.

The higher scores are clustered between 12 and 22 points. No one received a higher score than 26. Only one student received a score of 8, being the lowest. This could mean that third grade has a higher level of vocabulary than second grade. Also, they had the advantage of working with the type of exercises they had already seen in the previous semester; for instance, they worked with yes/ no questions and matching exercises. Therefore, they might have been better prepared for the test. Although they struggled with open questions as well, they evidence higher scores on different sections compared to second grade. All third graders completed the test. Once again, Sections 1, 2 and 4 were much easier than Sections 3 and 5. In fact, half of the students of the group obtained 5 points on the first section and performed better on the open questions.

As seen in Figure 3, results vary on both groups as some of the students in second grade were not able to finish the test within the expected time results were affected.

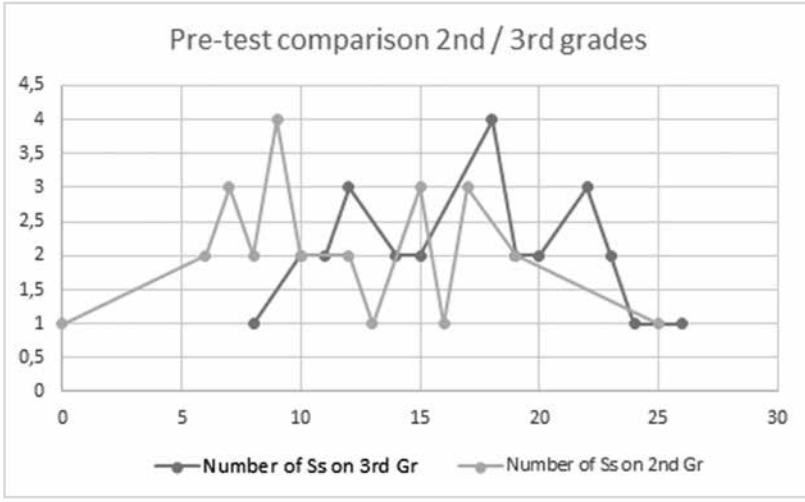

Figure 3. Pre-test, second and third grade compared

When comparing the scores, Figure 3 illustrates that results for second grade were between 7 to 17 out of 35 whereas third grade evidenced scores between 12 and 23. Also, we can see the lowest and highest scores on both groups. Second grade had students with very poor results although there was one student with one of the highest scores from both courses. Third grade did not evidence very low results, and there were few students with high results.

Post-test. Here students demonstrated clear progress on vocabulary knowledge and the ability to master the different exercises proposed in the sections of the test. They increased their recognition and use of new vocabulary, and were also able to do the same for words related to other topics covered in previous lessons. This demonstrates students'

improvement in both acquisition of new and retention of old and new vocabulary. As shown in Figure 4, the results on the post-test increased radically, especially with second grade, who struggled so much with the pre-test but they performed very well on the post-test.

Figure 4 illustrates the pre- and post-test comparison by 2nd graders.

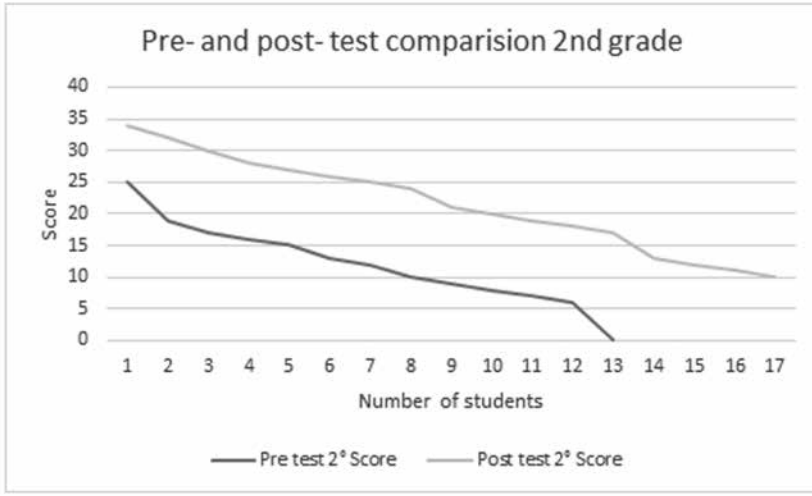

Figure 4. Pre- and post- test comparison, 2nd grade

The second grade group showed great improvement on the post-test compared with the pre-test. This improvement indicates that learners were able to acquire and retain a great quantity of vocabulary, and also that they adapted to or became familiar with the kinds of exercises on the test from the pre- to the post- test. In general, on the post- test, students finished within the established time and sections were handled with less inconvenience. They went from a 25 as the highest score for one learner on the first test to a 34 on the second test and a 10 as the lowest score on the second test whereas there were some students with as low as 0 or 6 points on the first test. There was an average increase of 10 points from the pre-test to the post-test.

Figure 5 illustrates the pre- and post-test comparison by third graders.

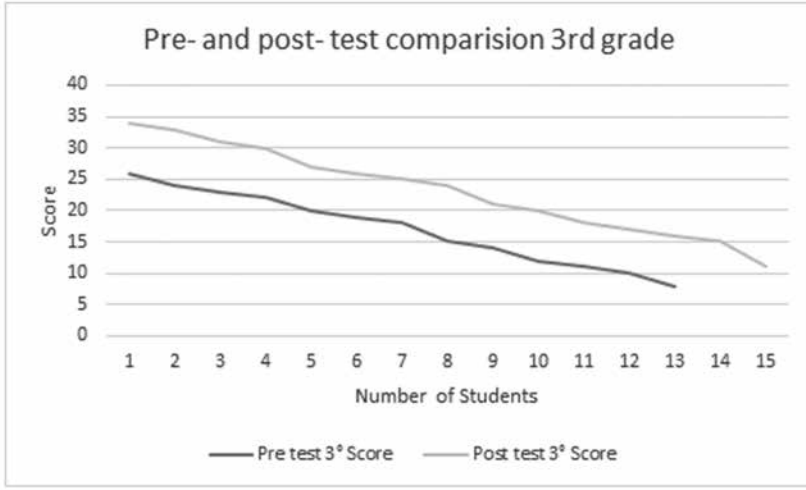

Figure 5. Pre- and post- test comparison, 3rd grade

Results on third grade also increased but not as well as shown on second grade. They obtained a 26 as the highest score for the pre-test and a 34 for the post-test, then. One individual obtained a score of 11 as the lowest result for the post-test compared with a score of 8 on the pre-test. They were able to finish the test in the time provided and were also able to answer all the sections with ease.

ATTITUDES AND MOTIVATION TOWARDS THE USE OF TRANSLATION STRATEGIES

While using the different strategies, learners' attitudes and motivation were also significant variables for this study. Finding out the effect of the dictionary, glossaries, and cognates on students' learning process was an important concern for the researcher, who was concerned about their ability to acquire and retain new vocabulary but also interested in exploring students' awareness of the strategies. This was necessary in order to determine the degree to which the translation strategies and the intervention might be responsible for the improvement in vocabulary. The way to discover this information was by interviewing the students. The teacher-researcher interviewed a sample of students from each group who participated in the interviews that documented their opinions, comments, and difficulties with classes, activities, and obviously the strategies. These comments were reviewed and analyzed, and led to several conclusions, considering as well the similarities and differences among learners' opinions and behaviors in both groups.

When students were asked "*If you see a new word, what could you do to know its meaning?*" They came up with many different answers, some vague responses, but others

absolutely accurate, which clarifies learners' understanding of the importance of the strategies and their use. One student mentioned, *"What is similar to a word in Spanish, for example, we see* lemon*, I relate to* limón *because they resemble each other. So, [in the exercise] it seemed easier for me to guess these new words*"[1]. This student selected cognates as the most useful strategy for learning new words; however, this was not the most chosen strategy by students on interviews.

Regarding the use of the glossary, learners liked this strategy because it was easier to follow the guides, which were useful for recognizing new vocabulary that does not resemble words in L1. This was one of the most used strategies due to its easy use. Whereas cognates were not always appropriate and the dictionary was quite time-consuming, the use of the glossary was simple and easy to apply. As such, when reviewing vocabulary, the teacher just asked the meaning of the word, and students were the ones in charge of recalling the meaning of these words from previous classes. Furthermore, maybe because it was one of the most used strategies during the interventions, most of the students in the interviews selected the glossary as one of the most helpful and useful strategies for learning new vocabulary.

Other students supported the use of the dictionary. They argued that it was not necessary to ask classmates or teachers for help to work with a dictionary, once you know how to use it. Nevertheless, when learners were asked, *"Which is the most difficult to use?"* a number of learners said the dictionary. One of the interviewed students claimed, *"I felt that it didn't work very well because we spent a lot of time on just one word, and we didn't find the others. We were supposed to rotate the words from group to group, but I didn't pay attention to the words that weren't part of my group."* Besides time, some students mentioned that they did not understand how to use the dictionary, and that it was confusing. Students were aware of the dictionary strategy, but they did not recognize the other two strategies with ease.

Another group of students said that the most useful strategy was the use of cognates; they replied that it is useful, easy and fast to learn new words because cognates are easy to recognize, and sound similar to their mother tongue. Also, they mentioned that it was easier to remember and relate. The use of the dictionary was also mentioned as useful. They liked it because they did not need to ask the teacher or classmates about the word meaning. However, some students argued that it was not as good as it was expected due to the difficulty of using the dictionary, and the time spent on the strategy. Indeed, some students did not use the dictionary correctly, especially in second grade. They did not find words because they did not know how to look for them. Adapting these students to this task was challenging. The last strategy was using a short glossary. Students mentioned that it was useful but not as much as cognates. Learners commented that it was a good strategy because words are very different to their meaning in their L1 and it helped them understand readings, sentences and work with the worksheets. Nevertheless, they mentioned that as English words were so different from their translations, the glossary did not help them remember the words.

[1] Translated from the original Spanish by the author.

In addition to learners' responses in the interviews, the teacher-researcher was able to draw other conclusions as to students' reactions to and ease of use with the different strategies. In general, second grade struggled with the use of the dictionary; they had difficulties looking up words because they were completely unfamiliar with the way in which a dictionary works. As a result, they spent more time than third grade on this strategy. Also, it seemed to be the first time that second grade students ever used a dictionary in class. Some did not even realize that the dictionary was divided into English and Spanish.

There were also some difficulties regarding cognates. For example, the topics *clothes* or *professions* did not have so many natural cognates, so it was difficult to use this strategy with these lexical sets in third grade. Second grade, on the other hand, had more cognates to work on because the topics were *food* and *animals*. This might be one reason for the second graders' preference on the cognates use whereas third grade learners chose to use the dictionary more than cognates or glossary.

In general, the use of glossaries worked well, possibly even more than dictionary and cognates because the whole class had the new words on the board every class as well as recycled words from previous classes. As with the dictionary, learners struggled to remember words because they are different to their meaning in Spanish, and some students tried to relate these glossary words to similar words in Spanish.

In conclusion, it can be said that translation strategies are quite helpful for learners in the acquisition and retention of new vocabulary. Not only were they able to demonstrate recognition and use of the vocabulary taught during the intervention, they also demonstrated knowledge of vocabulary from previous years, as demonstrated by the pre- and post-test. Students' motivation towards vocabulary learning in English also proved to be an important outcome for this study. Individuals were aware about the use of the different strategies to facilitate the learning and acquisition of English language, and they were more engaged in class activities. Because of students' awareness of the use and purpose of the strategies, and their expressed and informed preferences for some strategies over others, it is possible to say that the intervention using translation strategies had a direct effect on students' improvement in terms of mastery of old and new vocabulary in English. Still, strategies need reinforcement, time of adaptation, and alternation with other strategies and methods.

CONCLUSIONS

The purpose of this study was to investigate the effect of three translation strategies on the acquisition and retention of English vocabulary when learning a foreign language in a private school in Bogotá, Colombia. The groups chosen for this intervention were second and third grades, each with 27 students. Additionally, the research was also conducted to observe students' attitude and motivation when putting these strategies in practice. Through students' performance on the pre- and post-vocabulary tests, it was possible to see the usefulness of cognates, dictionary, and glossary as strategies to acquire and retain vocabulary in English.

Specifically, the translation strategies implemented were helpful in both the acquisition and retention of new vocabulary. Not only were students able to demonstrate recognition and use of the vocabulary taught during the intervention, they also demonstrated knowledge of previous vocabulary, as demonstrated by the pre- and post-test. Students' motivations and attitudes towards vocabulary learning in English also demonstrated an important outcome for this study. Individuals were aware about the use of the different strategies to facilitate the learning and acquisition of English language, and they were more engaged in class activities. Because of students' awareness of the use and purpose of the strategies, and their expressed and informed preferences for some strategies over others, it is possible to say that the intervention using translation strategies had a direct effect on students' improvement in terms of mastery of old and new vocabulary in English. Although the strategies proved to be quite useful, they clearly need reinforcement, and time for implementation and adaptation in class. Further, it proved beneficial to alternate translation strategies with other techniques for teaching and learning new words, such as images, games, etc.

USE OF TRANSLATION

In terms of the use of translation, findings demonstrate translations and L1 are effective strategies for acquiring new vocabulary and information in English classes. In this study, it was possible to relate this with the results obtained by Hummel (2010), Asiyaban and Bagheri (2012), Pakzadian (2012), and Sieh (2008), who were in favor of using different kinds of translation approaches for investigating the effect on learners' vocabulary improvement, which might be related to the acquisition and retention of this research study. In fact, Pakzadian (2012) claimed that those who used L1 definitions performed better on tests compared to other groups who do not, fairly similar to the participants of the present study, whose vocabulary size increased after the translation techniques.

ROLE OF L1

Besides translations and other approaches, the role of L1 is important to examine in particular. Although students' mother tongue is sometimes not allowed by teachers, schools, and programs, in this case the use of Spanish is pervasive in the context due to students' limited proficiency in English. As such, it was thought imperative to inquire as to the effect of using L1 intentionally for specific purposes in the foreign language classroom. In general, the literature demonstrates that comprehension in L2 improves when L1 is used (Salmona, 2014). As students are developing both languages, they are able to increase vocabulary and understanding. Additionally, Ada and Baker (2001) as well as Higareda, et al. (2009) concluded that it is vital to use the mother tongue to strengthen classroom relationships and increase student motivation.

In terms of student motivation, one of the variables of the study, it is important to point out that the interviews and observations during interventions and tests demonstrate learners' attitudes and feelings towards the translation strategies applied in classes. It was noticeable to observe students' attitudes when they did not understand words and compare that to their attitudes once words were translated using the strategies they felt comfortable with. This can be connected to Cuartas (2013), who found that the mother tongue has an essential role in English learning, improving motivation, cognition, and attitudes, and increasing student confidence.

One of the most noticeable limitations of the present study was time. Sessions were approximately 45 to 50 minutes, which was usually not long enough to complete activities or use the strategies effectively. For example, when the activity included the dictionary, students spent a long time finding the meanings of words, resulting in incomplete activities. Another important limitation was classroom management, especially with third grade. This group presented almost 10 students with behavior difficulties that impacted the group's ability to finish the sessions. There were sessions in which we could not go further from the strategy to the activity. Finally, some students were absent because of sessions with outside specialists. In general, this presented learning issues as once they returned to class as they felt lost and had difficulties accomplishing the lesson goals.

It would be interesting to continue investigating these two main themes. First, there is little information about translation with children; for example, in a more advanced level, students have some abstract concepts and false cognates that would not be as easy as topics for children. However, cognates work well because they are simple and concrete for learners. In addition, the use of Spanish would be important to be investigated more in terms of its usefulness in a non-bilingual environment and its strengths and difficulties.

ACTION PLAN

Teaching English in a school with few contact hours is a challenge and adapting learners to the foreign language is one of the most difficult tasks. However, it can be concluded that teachers do not need to forbid learners from using their L1. In fact, they can support their process with explicit and intentional support from the mother tongue. These are some aspects to bear in mind:

Suggestions for teachers:

- Teachers should understand the importance of the first language in students' learning process and its ability to create connections between the languages.
- The use of mother tongue should be used intentionally and with care. There should be times in which its use is vital, and others in which its overuse may affect results.
- Strategies should be used according several conditions, such as learners' age, proficiency, topics, and time.
- Using the dictionary works better when students have reached a certain stage in their literacy process, and still, they need time to learn to use it properly.
- Vocabulary lists should not be too long because this can be overwhelming for learners. Teachers need to reuse and reinforce the vocabulary on the lists, including new words gradually.

Suggestions for the school:

- Learners need repeated exposure to the language. In many schools there are not enough contact hours to guarantee sufficient exposure.
- Schools need to provide materials and show commitment to the goal of teaching a new language. It is challenging for teachers to work without books, flashcards, or digital aids.
- Providing support for teachers to be in contact with the language should be of vital importance. This will help make the language more accessible for everyone.

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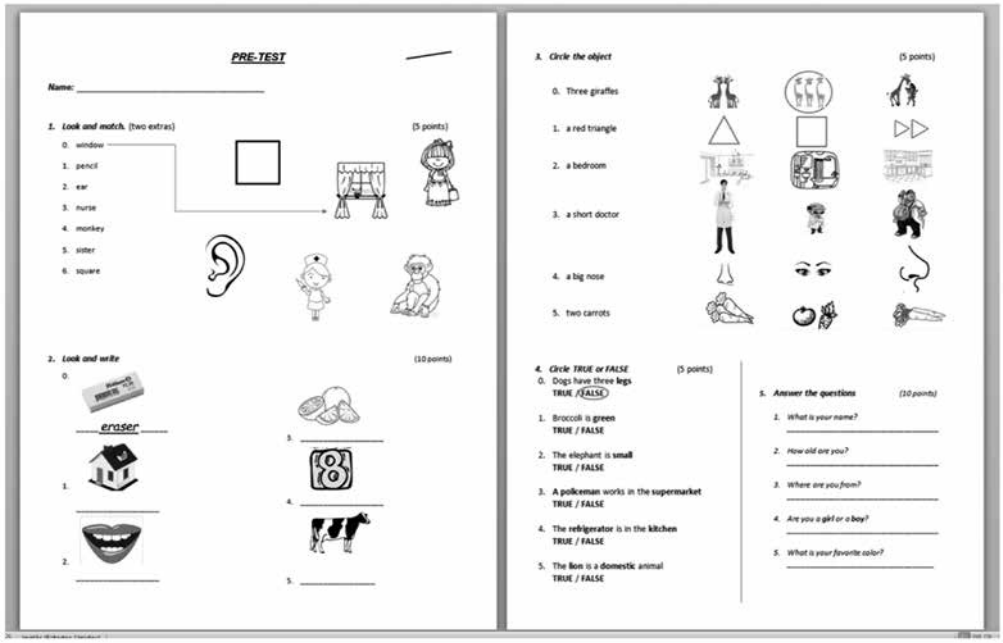
APPENDIX

PRE & POST-TESTS



PRE-TEST

Name: _____

1. **Look and match.** (two extras) (5 points)

0. window
1. pencil
2. ear
3. nurse
4. monkey
5. sister
6. square

2. **Look and write** (10 points)

0. eraser
1. _____
2. _____
3. _____
4. _____
5. _____

3. **Circle the object** (5 points)

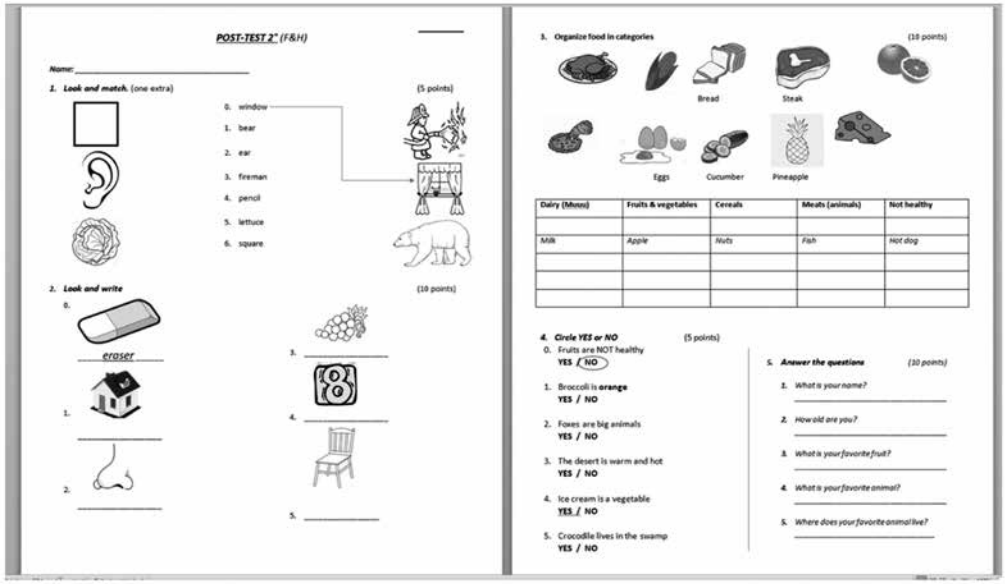
0. Three giraffes
1. a red triangle
2. a bedroom
3. a short doctor
4. a big nose
5. two carrots

4. **Circle TRUE or FALSE** (5 points)

0. Dogs have three **legs**
TRUE / (FALSE)
1. Broccoli is **green**
TRUE / FALSE
2. The elephant is **small**
TRUE / FALSE
3. **A policeman** works in the **supermarket**
TRUE / FALSE
4. The **refrigerator** is in the **kitchen**
TRUE / FALSE
5. The **lion** is a **domestic** animal
TRUE / FALSE

5. **Answer the questions** (10 points)

1. *What is your name?* _____
2. *How old are you?* _____
3. *Where are you from?* _____
4. *Are you a girl or a boy?* _____
5. *What is your favorite color?* _____



POST-TEST 2 (F&H)

Name: _____

1. **Look and match.** (one extra) (5 points)

0. window
1. bear
2. ear
3. fireman
4. pencil
5. lettuce
6. square

2. **Look and write** (10 points)

0. eraser
1. _____
2. _____
3. _____
4. _____
5. _____

3. **Organize food in categories** (10 points)

Bread, Steak, Eggs, Cucumber, Pineapple

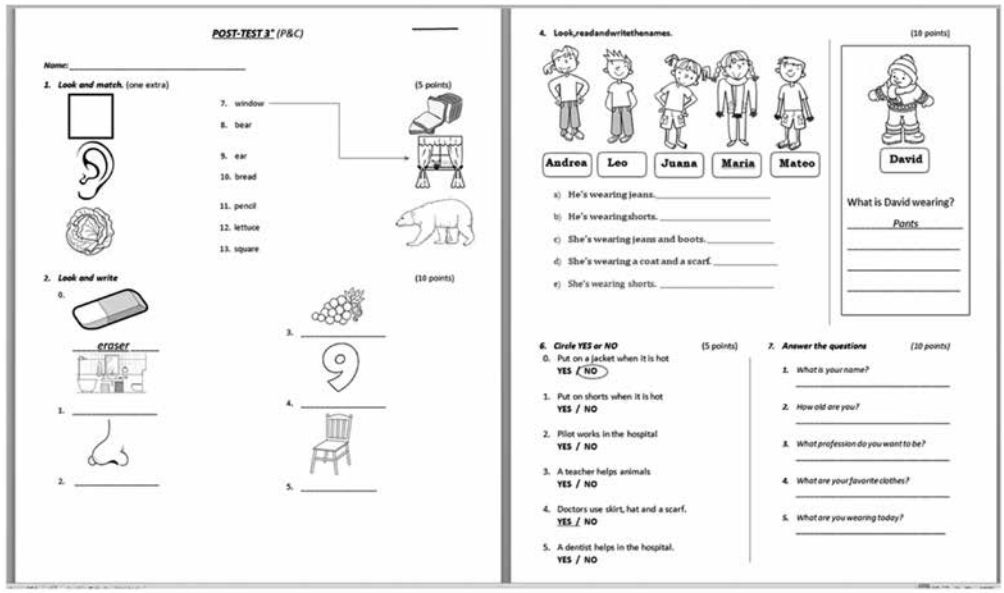
Dairy (Mmm)	Fruits & vegetables	Cereals	Meats (animals)	Not healthy
Milk	*Apple*	*Nuts*	*Fish*	*Hot dog*

4. **Circle YES or NO** (5 points)

0. Fruits are NOT healthy
YES / (NO)
1. Broccoli is **orange**
YES / NO
2. Foxes are big animals
YES / NO
3. The desert is warm and hot
YES / NO
4. Ice cream is a vegetable
YES / NO
5. Crocodile lives in the swamp
YES / NO

5. **Answer the questions** (10 points)

1. *What is your name?* _____
2. *How old are you?* _____
3. *What is your favorite fruit?* _____
4. *What is your favorite animal?* _____
5. *Where does your favorite animal live?* _____



POST-TEST 3* (P&C)

Name: _____

1. Look and match. (one extra) (5 points)

7. window
8. bear
9. ear
10. bread
11. pencil
12. lettuce
13. square

2. Look and write (10 points)

0. eraser
1. _____
2. _____
3. _____
4. _____
5. _____

4. Look, read and write the names. (10 points)

Andrea | Leo | Juana | Maria | Mateo

a) He's wearing jeans. _____
b) He's wearing shorts. _____
c) She's wearing jeans and boots. _____
d) She's wearing a coat and a scarf. _____
e) She's wearing shorts. _____

David

What is David wearing?

Pants

6. Circle YES or NO (5 points)

0. Put on a jacket when it is hot
YES / NO

1. Put on shorts when it is hot
YES / NO

2. Pilot works in the hospital
YES / NO

3. A teacher helps animals
YES / NO

4. Doctors use skirt, hat and a scarf.
YES / NO

5. A dentist helps in the hospital.
YES / NO

7. Answer the questions (10 points)

1. What is your name?
2. How old are you?
3. What profession do you want to be?
4. What are your favorite clothes?
5. What are you wearing today?

CHAPTER 4

USING GRAPHIC ORGANIZERS TO IMPROVE READING COMPREHENSION AND MOTIVATION TOWARDS READING IN HIGH SCHOOL STUDENTS

ALEXANDER IZQUIERDO CASTILLO

NARDA LILIANA RODRÍGUEZ SOSA

Many high school teachers are concerned about teenagers' low motivation to read and undeveloped reading skills. Especially in the foreign language, reading may be difficult for learners, and too often reading texts are of little interest to high schoolers. Teachers Alexander Izquierdo and Narda Rodríguez had been working with graphic organizers in their 11th grade classes, and had seen promising indications that these visual and mental schemes might not only improve comprehension, but may help learners feel more motivated towards reading in English. Their study shares the implementation of two initial GO models, indicating that their appropriate use can bring quite positive results.

ABSTRACT

The purpose of this study was to determine the effects of implementing graphic organizers (GOs) to improve reading comprehension and motivation towards reading in high school students. The research was carried out in two public schools, *Colegio Acacia II and Colegio Bicentenario,* located in the locality of Ciudad Bolivar in the south of Bogotá and in the municipality of Funza, Cundinamarca, respectively. In both schools, English is an additional subject, with just three hours of class per week. Sixty-eight 11th grade students from both schools received a five-week intervention featuring the explanation, implementation, training and practice using Story and Semantic Maps to understand written texts. Data on students' attitudes, opinions, and performance were collected in pre- and post-tests, questionnaires and reflective journals. Students stated that GOs are a useful and enriching strategy to comprehend texts in English. GOs also helped students increase vocabulary and organize their ideas better. In this way, participants were able to identify main ideas more easily and felt more comfortable reading the texts. This aspect further increased students' motivation. Moreover, students realized that graphic organizers are not only a tool to access texts in English, but also a useful strategy for reading in other content subjects. Finally, even though participants tried to create some GO schemes of their, learners require more time to be autonomous in this skill.

Key words: Reading strategies, Graphic Organizers, Motivation, Autonomy

RESUMEN

El propósito de este estudio fue determinar los efectos de implementar Organizadores Gráficos (GO) para mejorar la comprensión lectora y la motivación de los estudiantes de secundaria hacia la lectura. La investigación se llevó a cabo en dos escuelas públicas, el Colegio Acacia II y el Colegio Técnico Bicentenario, ubicadas en la localidad de Ciudad Bolívar, en el sur de Bogotá y en el municipio de Funza, Cundinamarca, respectivamente. Ambas escuelas tienen la clase de inglés como materia adicional, con solo tres horas de clase por semana. Los participantes fueron 68 estudiantes de 11 ° grado de ambas escuelas entre 16 y 19 años. Este estudio se basó en una intervención de cinco semanas basada en la explicación, implementación, capacitación y práctica del Story Map y el Semantic Map para abordar textos. Los datos sobre las actitudes, opiniones y desempeños de los estudiantes se recopilaron en pruebas previas y posteriores, cuestionarios y diarios de campo. Los estudiantes declararon que los Organizadores Gráficos son una estrategia útil y enriquecedora para comprender textos en inglés. Dichos Organizadores también ayudaron a los estudiantes a aumentar el vocabulario y organizar mejor sus ideas. De esta manera, los participantes fueron capaces de identificar las ideas principales del texto fácilmente y se sintieron más cómodos leyendo los textos. Este aspecto aumentó su motivación hacia la lectura porque pudieron abordar los textos de lectura de manera más fácil, rápida y agradable. Además, se dieron cuenta de que los organizadores gráficos no solo son una

herramienta para acceder a textos en inglés, sino que también es una estrategia útil para leer en otras asignaturas. Finalmente, a pesar de que intentaron crear algunos esquemas propios utilizando los Organizadores Gráficos, los alumnos requieren más tiempo para ser autónomos en esta habilidad.

Palabras clave: Estrategias de lectura, Organizadores gráficos, Motivación, Autonomía

Reading is an essential skill today because citizens anywhere and anytime of their lives require reading for learning in different contexts including school, university, and for life in general. When developing reading comprehension, teachers propose different strategies to guide this process and encourage students to improve their skills. This concern about reading is due to its great influence on learning and its power to link learners to the world. Reading enables learners to be updated and in constant access with knowledge, to be authors of their own realities, and to understand their own contexts through texts.

Studies have shown that reading responds to readers' objectives, which may range from entertainment to academic purposes, and that learners have to find the appropriate strategy to reach their goals (Solé, 1992). These strategies include graphic organizers, which help readers understand the structure and main ideas of the text, establish relationships between the ideas (Coburn, as cited in Vargas & Zúñiga, 2018, p. 6), and improve reading comprehension. The implementation of these schemes facilitates the processes of reading and allows learners to structure the information to make texts easier to understand.

Researchers assert that another benefit of GOs is that they help learners activate prior knowledge. According to Manoli and Papadopoulou (2012), GOs establish connections between old and new information, and it is precisely these connections that make the reading process easier. Even though there are few studies about the use of GOs to encourage learning and reading processes in different content subjects, Rossie and Campbel (2012) argue that these schemes are not only useful for understanding texts in English, but also to establish relationships between the concepts and ideas in interdisciplinary aspects.

Another aspect that is important to consider is the motivational element. A few research studies have stated that graphic organizers help improve students' attitudes towards reading. Mede (2010), for example, considers that GOs not only help make teaching effective, but also enhance students' attitudes towards reading in English. Mede argues that the change in students' attitudes is due to the power of GOs to facilitate understanding and retain information from a determined text.

These theoretical considerations about reading and the benefits of graphic organizers have been taken into account in the pedagogical practice in two public schools in Bogotá,

where GOs have been incorporated in high school English classes. In the course of informal diagnostic inquiry in the setting, the teacher-researchers in this project noticed that although GOs were being used in English classes, learners from these schools continued having difficulties summarizing information, organizing concepts, and writing them in the appropriate part of the GO. In some cases, they were not able to identify the main ideas of a text in order to create their own organizers, for example. In addition, observations helped identify weaknesses not only in the reading process, but also in the application of GOs in other content subjects other than Spanish or English. Even though the research suggests that the use of a graphic tool helps improve students' attitudes in class, it is important to inquire as to whether GOs also help students move closer to texts and increase their motivation towards reading in general.

As a result of the theoretical and literature reviews and the diagnostic inquiry *in situ* and statement of the problem, the present proposal has determined as key points the influence of graphic organizers on students' reading process, the way they might strengthen reading processes in other subjects, their role in helping students feel more motivated towards reading using this strategy, and the potential for learners to create their own schemes after a guiding intervention.

LITERATURE REVIEW

Researchers have argued the need to explore the effectiveness of the use of graphic organizers in relation to first language and second language reading. Currently, GOs have gained importance in subject-area reading, particularly in terms of arranging the content of a passage and meaning-making. Most of the literature includes studies published in the last 5-14 years in Latin America, the United States, Canada, Germany, and some countries in Asia. This review includes studies related to reading comprehension, interdisciplinary reading practice, reading motivation, and the promotion of autonomy. The majority of these studies demonstrate that GOs help first and second language learners improve reading comprehension, facilitate language acquisition, and improve learning skills not only in language content subjects, but also in different fields of knowledge.

IMPROVING READING COMPREHENSION AND SCHEMA THROUGH GRAPHIC ORGANIZERS

A range of studies focus on the effectiveness of graphic organizers on reading comprehension. In general, findings indicate a positive effect of this strategy to enhance reading comprehension in students from different levels and ages in content subjects such as math, science, and social studies.

Manoli and Papadopoulou (2012) conclude that GOs help learners activate prior knowledge, recall and retain information, and in "gaining an insight into the text structure, identifying as well as connecting the main ideas of a text" (Manoli & Papadopoulou 2012, p. 354). The study was developed with elementary students and suggests that this strategy is an effective tool of communication in both first and second language. Similarly, Öztürk (2012) and Khaki (2014) conducted research studies with control and experimental groups and concluded that reading comprehension and in particular information structure improved in the experimental group through the constant use of the GOs. Similarly, Llumiquinga's (2011) study on the Ecuadorian Army found that the GOs are a useful strategy to improve reading comprehension and learners' performance in learning English. Likewise, Cuevas (2012) noted that students in treatment groups showed improvement in constructing an episodic memory structure that could be interpreted as the germination of schemata. Both studies recognize the importance of this strategy to create schemes and mental structures, useful for future reading tasks.

Moreover, Jiang and Grabe (2007) and Chio (2009) recommend the use of GOs as an instructional tool to help learners with difficulties in second language learning (L2) particularly, in representing the discourse framework of a text. In this way, students are able to remember vocabulary and form a structure of the second language background that facilitate language acquisition and meaning-making.

INTERDISCIPLINARY READING PRACTICE

Some studies highlight the importance of graphic organizers to help students understand texts from other content areas, such as social studies, math, science, and medicine. In general, findings indicate that GOs improve understanding and make texts easier, faster and more enjoyable to read, particularly because learners are able to manipulate and understand complex material content.

Mann (2014) concluded that GOs, specifically concept/event maps and sequence chains, are vital tools that aid in the comprehension of the complex material presented in the social studies curriculum. They further report that the strategy can be utilized by students with or without disabilities. In a similar study, Goss (2009) found that concept mapping served as an assessment tool to evaluate student learning and measure growth, in this case, fifth-grade earth science content. A secondary purpose was to determine students' perceptions of how concept mapping assisted in making connections to the content. Concepts were used as a way to organize the various sources, and most importantly, collaboration with peers was promoted in order to better understand the concepts in the unit. The findings of the study showed that the use of concept mapping allows learners to comprehend science content.

Maccini and Gagnon (2005) found that GOs are a valuable tool for assisting middle school students with learning disabilities with basic mathematical procedures and

mathematical problem-solving because they promote higher-level thinking, reasoning, and problem-solving skills. The authors suggest that teachers should use GOs consistently, coherently, and creatively. Also, teachers should take into account students' individual needs and make the adjustments and adaptations (e.g., provide partially completed GOs, highlight information in the text, provide cues at the bottom of a blank GO, and provide group activities). By doing this, learners are able to understand and solve the mathematical operations.

In a similar study, Rossie and Campbel (2012) evaluated how teaching GOs can explicitly foster the building of science vocabulary and increase scientific understanding. They point out that the use of GOs allows students to think critically, explore relationships, and process their own knowledge in a visual and organized method. In this way, GOs are a useful way to scaffold students' understanding as well as engage students in higher levels of Bloom's taxonomy, namely evaluating and creating.

Another study that supports student scaffolding was developed by Chiang (2005), who found that graphic organizers have a positive impact on reading comprehension when teachers activate previous knowledge and generate strategies based on GOs. The study shows that GOs are effective in facilitating reading comprehension and learning attitudes when students apply them cooperatively in group work after reading. The findings suggest that GOs are an effective pedagogical tool for promoting EFL reading comprehension and improving attitudes toward EFL reading, particularly when learners work cooperatively in different content subjects.

INCREASING MOTIVATION

In addition to improvements in reading comprehension, other studies have looked at the relationship between GOs and motivation, specifically attitudes, engagement, meaningful environments, and the positive influence GOs have on task development. Mede (2010) posits the benefits of GOs not only to help make teaching effective, but also to change students' attitudes towards reading in English. Mede argues that this is due to the power of GOs to help learners understand and remember content. Although this study did not inquire or report on the possible effects of this practice on learners' attitudes towards the learning of a foreign language, it is possible to explore this link in Sharpe's (2013) study, which aimed to examine the efficacy of using GOs in the development of a more effective second-language pedagogy. After collecting the data from fifty Japanese engineering students, the study found on the whole that aptitudes, learner preferences, motivation, and self-perception were some of the most important aspects that were improved in the L2 reading classroom. Additionally, Sharpe (2013) concludes that the strategy of GOs provides a means for students to overcome their difficulties in reading comprehension, which aids in boosting motivating in any class. Sharpe (2013)'s study also concurs with González (2017), who found that GOs decrease the level of anxiety and hence motivate students to

continue working on reading tasks. After the implementation of GOs, students showed a more positive attitude towards reading, and considered these schemes as a helpful strategy.

In addition to studies linking GOs and motivation, other research has focused on the impact of GOs on student self-efficacy. Khajavi and Ketabi (2012) found in a group of intermediate EFL students that GOs give meaning to a specific task and in this way students can improve reading and overcome difficulties understanding texts. When students achieve their own goals and understand a text using these schemes, they make reading meaningful and the relationships between the ideas in the text are clearer. This process generates a positive effect on students' attitudes and makes the act of reading motivating and more interesting than before.

BUILDING AUTONOMY

Apart from measuring the impact of graphic organizers in students' attitudes and reading comprehension, other studies have evidenced the contributions of GOs for constructing knowledge and transferring it to different contexts. Sam and Rajan (2013), Stull and Mayer (2007) and Tavşanli, Kozakli and Kaldirim (2018) examined the use of GOs as a scaffolding tool to construct text meaning and decode information in different scenarios, strengthening at the same time students' creativity and independence. Sam and Rajan (2013) found that GOs help middle school students become more involved in their academic tasks and construct their own drafts of schemes in other content subjects. They affirm that main ideas, details, facts, opinions, comparisons, and contradictions organized in GOs help learners achieve a better understanding of texts. Likewise, in Stull and Mayer's review (2007), it was possible for students to develop a process of seeking, understanding, selecting, organizing, and structuring information in GOs, which helped them engage with their own academic improvement. Furthermore, Stull and Mayer (2007) outline how GOs promote a generative processing in helping students transfer knowledge to a higher level. Additionally, Tavşanli, et al., (2018) conclude that students increased their problem-posing success using the GOs. The teacher produced colorful illustrations of GOs in order to focus students' attention; with this, learners were then able to construct their own schemes to solve math problems. By applying this tool, learners were able to boost interest in problem posing activities in other contexts.

In a different set of investigations, Alibabaee, Mehranfar and Zarei (2014) and Torres, Orleans and España (2014) demonstrate that GOs are not only a strategy for structuring information, but also a tool for activating prior knowledge that leads to self-directed learning. Alibabaee et al., (2014) investigated the impact of concept mapping on EFL learners' reading comprehension and learner autonomy**.** Their findings show the effectiveness of GOs in reading processes; however, they suggest that to develop and enhance autonomy, it is necessary to carry out more long-term interventions with instructors' guidance. This study also examined cognitive and metacognitive processes when constructing concept maps

and how learners can assess themselves. Torres, et al. (2014) concluded that the application of a web diagram, flowchart-concept map, Venn diagram, and pictorial graphics made a significant difference in experimental groups, particularly demonstrating a positive attitude towards subject content. Findings indicate that participants developed more positive attitudes towards their own content learning through the use of GOs, which helped them improve performance in the subject. In addition, by applying this strategy, learners were able to achieve their goals and feel confident enough to replicate the same process in other subjects.

METHODOLOGY

CONTEXT

This research was carried out with the approval of Principals from both the *Colegio Acacia II* and the *Colegio Bicentenario*. These public schools are located in the locality of Ciudad Bolivar in the south of Bogotá and in the municipality of Funza, Cundinamarca, respectively. The *Colegio Acacia II* started working with high school grades in 2000 with 2700 students in both morning and afternoon shifts. The *Colegio Bicentenario* was founded in 2009 with approximately 900 students in the morning. Today, the *Colegio Acacia II* has around 1560 students and the *Colegio Bicentenario* has 1410 students; both institutions have courses from kindergarten to eleventh grade.

In both schools, English is an additional subject, with just three hours of class per week. The English program follows a communicative approach based on the National Ministry of Education (MEN) programs of *English for Diversity and Equity* and the *Suggested English Curriculum*, which have been adjusted according to the contexts and specific needs of the schools. This has been a demanding task because the MEN's suggested English curriculum is quite ambitious and requires more class hours than either of the schools offer (Ministerio de Educación Nacional, 2016).

The *English for Diversity and Equity* framework considers four general themes: health, democracy and peace, sustainability and globalization. These themes are transversal and contemplate the goals, objectives, standards, language functions, discourse and linguistic contents, and assessment indicators from sixth to eleventh grade. Furthermore, this proposal also aims for the development of the four language skills, essential for the students to be proactive and more competitive in order to face the requirements of a globalized world (Ministerio de Educación Nacional, 2016).

In terms of reading instruction in both schools, there have been some small initiatives developed in Spanish classes, using specifically the *before-during-after* lesson planning scheme. However, reading in the English class has not received consistent attention, due to external factors such as budget and logistics to ensure the required resources, and internal

factors regarding the interests, methodology and time to develop reading projects in English. Also, students' level of English, especially vocabulary, is basic, so this makes the development of reading activities more challenging.

PARTICIPANTS

Participants in this study were 68 students from the *Colegio Acacia II* and *Colegio Bicentenario*. Parents of the students gave written informed consent for their participation in the study. Students in both groups are between 16 and 19 years old and come from lower socioeconomic backgrounds and communities. Students' level of English is quite basic because they only have the opportunity of learning English at school, with no extra support at home, and little to no opportunities for travel abroad or study at private language institutes. In addition, students face other social challenges, such as drug use and early pregnancy, both hindering their academic process.

The participants in the study practice reading occasionally in the different content classes. In the English class, and according to some pedagogical observations, reflections, and researchers' practices, it was noticed that these learners struggle with reading in English, particularly due to their low interest in reading in a foreign language, lack of vocabulary, and unfamiliarity with reading comprehension strategies. Specifically, these learners, at the time of the study, were unable to identify main ideas or specific details of written texts. They also exhibited difficulties constructing meanings, summarizing and organizing information.

DATA COLLECTION INSTRUMENTS

Data was collected over a five-week period in three stages: preliminary work, GO explanation and intervention, and post-practice. Data collection instruments included pre- and post-reading tests using GOs, pre- and post-questionnaires on students' reading habits and attitudes, and teacher-researchers' reflective journals.

Pre-test. This instrument was a non-parametric test. "Non-parametric tests have the advantage of being tailored to particular institutional, departmental and individual circumstances. They offer teachers a valuable opportunity for quick, relevant and focused feedback on student performance" (Cohen, et al., 2007, p. 415). The test asked participants to read a text and organize the information using a GO. The purpose of this instrument was to see to what extent students were able to identify general and specific information, and summarize ideas from a text related to health and nutrition. As students took the test, researchers recorded observations and reflections in reflective journals, allowing for a wider perspective on students' interest and attitudes towards reading.

Pre-questionnaire. The study also featured a semi-structured pre- questionnaire with open and closed questions. As Cohen, et al. (2007) describe, closed questions give specific patterns about a topic and the open-ended questions enable the responders to answer as

much as they wish. In this way, the instrument allowed researchers to know what students thought about their own reading comprehension process as well as their insights on the use of GOs at the outset of the study. The first part of the questionnaire asked participants to identify the frequency of their reading habits and their use of GOs in school. This instrument was given in Spanish, the students' native language.

Post-test. This instrument provided data about learners' performance using GOs after the intervention. Students read two texts. In the first, about *Sudoku*, learners were asked to complete the secondary ideas from the reading in a Semantic Map that already included the main ideas. The second, about a Hindu Myth, asked students to create their own GO to demonstrate their understanding. Students had the possibility to choose a Story or Semantic Map to identify and to diagram their ideas clearly.

Post-questionnaire. This instrument was compared with the pre-questionnaire in order to confirm the effectiveness of the intervention as it aimed to measure students' insights about their own reading comprehension process, their motivation towards reading, the use of GOs in other content subject areas, and their ability to create their own graphic schemes. It was based on closed and open-ended questions as in the pre-questionnaire.

Reflective journal. The teacher researchers kept reflective journals throughout the study in order to record and analyze their pedagogical practice using the GOs and in this way to diagnose the difficulties and needs of the current situation. The journals contained three observations based on general reflection, reading comprehension process and the application of graphic organizers.

INTERVENTION

The intervention proposed in this study consisted of a series of lessons designed to teach students on the use of Story and Semantic Maps (Appendix A) and their application to understand written texts in different content subject areas. The intervention was implemented over a five-week period in ten English lessons of two hours each. The researchers worked on narrative biographical accounts and descriptive texts. The texts were of an elementary to pre-intermediate level of reading, and most taken from the workbook *Know Now: Achieving Skill, Preparing for Life*[1]. Topics were related to science, social studies and literature, and included texts on biographies, use of technology, cooking and mysteries of nature (Galvis, Reina & Rincón, 2018).

Researchers explained the project to students, its benefits, and the terminology and meaning of the concepts. They trained students in the use of GOs to improve reading comprehension in the hopes of also stimulating positive attitudes towards reading in English. Learners received some practice, feedback, and suggestions to improve their reading skills.

[1] Workbook Know Now: Achieving Skill, Preparing for Life – Secretaría de Educación del Distrito – Cartilla de Inglés - Preparación para las Pruebas Saber 11.

The activities integrated different content subject texts in order to show students how GOs might strengthen comprehension not only in English but also in other fields. Students organized the information from the texts in groups and presented their GOs on the board (Appendix B).

DATA ANALYSIS AND INTERPRETATION

The pre- and post-test data collected in this study was analyzed following the recommendations given and explained by Cohen, et al. (2007) about exploratory data analysis.

Pre-test. Based on the pre-test application described above, the researchers designed an evaluation rubric with five assessment criteria designed specifically for analyzing students' management of the information in the text based on their completion of the GO. The assessment criteria included *identification of main ideas*, *recognition of key words, organization of content, hierarchical organization,* and w*riting format*. These aspects were assessed on a scale of excellent, good, fair and poor. Then the answers were tabulated (See Appendix C).

The researchers also analyzed the data in a qualitative way in order to "present all the data that are relevant to a particular issue" (Cohen, et al., p. 467). Researchers observed students' reactions and proficiency, questions, and the time they spent on the tests and recorded them in the reflective journals. These perspectives, reactions and comments during the activity were taken into account inside the analysis.

Pre-questionnaire. The questionnaire was carried out on paper with the 68 participants. The closed questions based on the frequency categories were tabulated in spreadsheets and graphs were generated for each question in order to analyze the results. With the open-ended questions, the most frequent answers with specific patterns were analyzed by the researchers.

Post-test. As in the pre-test, the post-test exercise was analyzed, following a rubric with five assessment criteria based on the same criteria. The results were tabulated and compared to the pre-test in order to verify the hypothesis and to determine the effectiveness of the use of Graphic Organizers in the reading process.

Post-questionnaire. As with the pre-questionnaire, its numerical data were tabulated. In Part B, the open-ended questions were analyzed by researchers considering the most relevant answers and the patterns presented in the learners' answers.

Reflective journal. The researchers created a format for three journals: before, during and after the intervention. The journals contained seven questions about the lesson related to the purpose of the lesson, achievement of objectives, things that went well, how

teachers fostered autonomy, and aspects to improve in the next lessons. Problems, issues and concerns were also recorded and described in more depth. At the end the information that was obtained from this analysis was related to the variables of the research and researchers determined if the actions of the lesson were appropriate or against the achievement of the main goals of the teaching research.

RESULTS AND DISCUSSION

This project proposed and carried out an instructional intervention in two classrooms of eleventh graders at *Colegio Acacia II* and *Colegio Bicentenario* in which teacher researchers implemented graphic organizers to aid in reading comprehension and with the aim of boosting students' motivation towards reading. During the intervention, students carried out a variety of exercises in which they activated their prior knowledge, became familiar with the vocabulary, and constructed meaning based on the texts proposed, and established relationships between main and the secondary ideas.

After the intervention, when comparing the results obtained from the pre- and post-questionnaires, it was possible to identify that most of the students stated that GOs helped them understand the texts more easily, faster and in a more enjoyable way because they were able to identify and organize the information. According to the research journals, after students started using the GOs, they were able to activate prior knowledge, became familiar with the vocabulary, and understood the texts better, which allowed them to feel more confident and motivated with the use of these schemes. There was a notable change in students' perceptions about their own reading process; their attitude towards reading was more positive. Additionally, they learned to use this strategy to read texts from different subjects; in fact, students shared what they learned in English class with their Economics and Philosophy classes.

By the end of the study, the only aspect in which students showed a clear need for improvement was in the production of their own GOs. Despite being able to learn and use GOs to improve comprehension, they were not able to create new ones. They continued trying to use only the Story and Semantic Maps that they had been taught. Researchers consider that students need more time to produce new GOs and use them regularly and autonomously in their reading process.

THE EFFECT OF GRAPHIC ORGANIZERS ON READING COMPREHENSION

The study sought to determine the extent to which the use of graphic organizers improve students' reading comprehension. Students were asked to complete Story and Semantic Maps, noting the key aspects of each text in the appropriate place on the map. Despite the fact that the activities were relatively new and the students were not familiar with

the structure of the GOs, they carried out the exercises with commitment and attempted to do their best. According to the observations in the reflective journals, it was noted that students tended to re-read the paragraphs in order to extract clues that might help them understand the meaning. They used the dictionary and frequently asked teachers about the categories of the scheme.

Pre- and post-tests evaluated students' *identification of main ideas, recognition of the key words, organization of the content, hierarchical organization* and *writing format* (See Appendix C). When examining students' performance on the pre-test, before the intervention the students' performance was between fair and low level, according to the assessment scale, especially in the recognition of the content, the writing format and the identification of the main ideas.

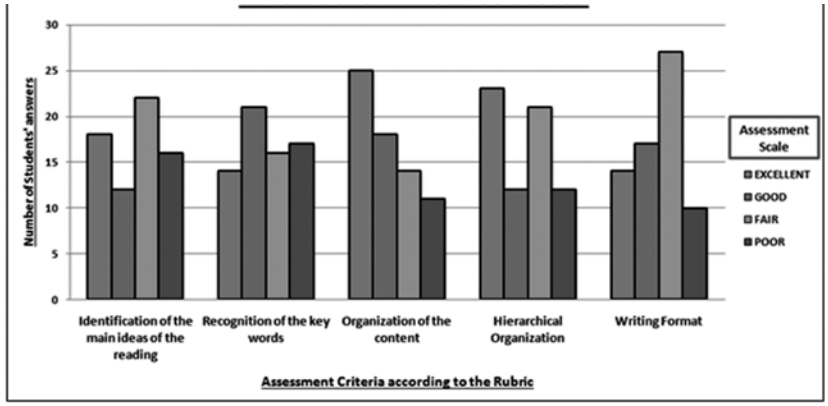


Figure 1. Student performance on the pre-test

In terms of students' performance on the pre-test and based on the journals recorded during the test, it can be deduced that it was fairly easy for students to identify the words related to the GO categories of the first reading, such as *benefits, What is a healthy breakfast?* and *What is not a healthy breakfast?* It was also easy for learners to order the information because the GO included the titles and clues to indicate where the information should be written. Figure 1 reflects students' difficulties determining the most important ideas, and how to write them according to their priority. The other difficulty was related to grammar and spelling because there were many activities in which students only wrote words without the correct coherence or syntax, or misspelled other words.

After the intervention, results improved in all the aspects evaluated related to text comprehension and the appropriate creation of the GOs. The post-test took into account the same criteria, and the scale of assessment was also based on excellent, good, fair and poor.

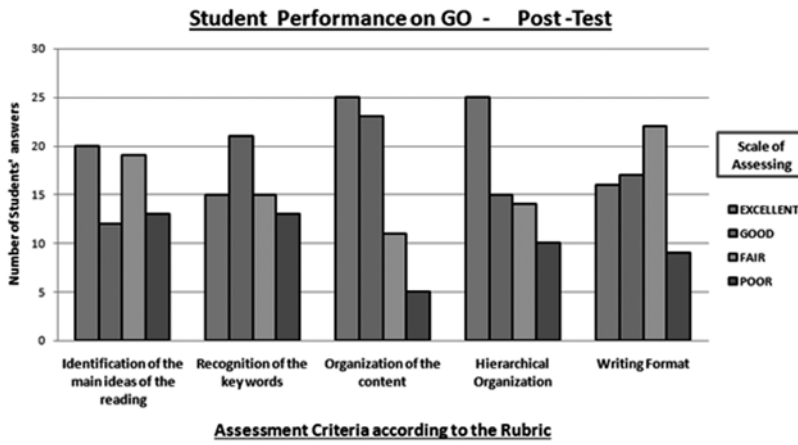


Figure 2. Student performance on the post-test

Figure 2 illustrates how students' organization of the content, hierarchical organization, and identification of the main ideas improved. The topics of the post-test readings were related to mathematics and religion/mythology. Some terms and expressions were unknown for learners, so it was necessary for them to check meanings and information, even re-read the texts. After this process, they were able to locate the information accurately on the GOs, organizing the ideas in the correct order. This improvement was seen in the reading about *Sudoku* and in the process of creating their own scheme about the Indian myth. In this way, Figure 2 illustrates that the number of students with poor results decreased and performance in the majority of the aspects assessed improved. For learners, the mental structure was clearer and they were able to identify main and secondary ideas of the texts. They were also able to organize the information in a hierarchy of levels of importance.

The only aspect that did not show a clear improvement was the writing as students continued to make grammar and spelling mistakes. Similarly, data obtained from the reflective journal showed that students' weaknesses in vocabulary continued because they only used the words required to do the task. Still, it was possible to observe students using different colors to organize those words in the GO and to underline or highlight the categories of the text, indicating a stronger engagement with the texts. This strategy helped learners to take ownership of their own learning process, to seek the required information and organize the GO, decreasing the use of the dictionary.

THE IMPACT OF GRAPHIC ORGANIZERS ON STUDENTS' PERCEPTIONS ABOUT THEIR OWN READING PROCESS

Taking into account this project's hypothesis that graphic organizers can make the reading process easier, faster and more enjoyable, the results also show that these schemes in fact contributed to an improvement in students' motivation towards reading. Although students were anxious when attempting to write the correct sentence for each chart and tended to copy fragments literally from the text, it was possible to observe positive attitudes towards finding a way to solve the activities. Moreover, at the end of the process, learners felt more confident when approaching texts. They were able to identify the main information and according to the post-test results improved in the classification of the concepts in the correct chart. By doing this, learners were more focused on the class and showed constant interest towards the topic and the development of the GO exercises. This indicates the presence of positive motivation during the activities, reflecting that these schemes are an effective way to help learners approach texts and become familiar with the vocabulary and the content. In other words, students were more involved with the different readings due to the fact that the process was easier after learning how the Story and Semantic Maps work.

Students' perceptions about reading are evidenced in the pre- and post-questionnaires applied at the beginning and end of the intervention. These questionnaires asked students to express the frequency with which they carried out particular reading activities, and specifically the use of GOs. Specifically, participants were asked the frequency with which they read in English, including the frequency with which they were able to identify main ideas and specific information, use schemes while reading, and were motivated when using GOs for reading. These aspects were thought to be directly related to learners' practices and motivation towards their own reading comprehension process through the use of GOs.

Figure 3 shows the results of the closed questions from the pre-questionnaire.

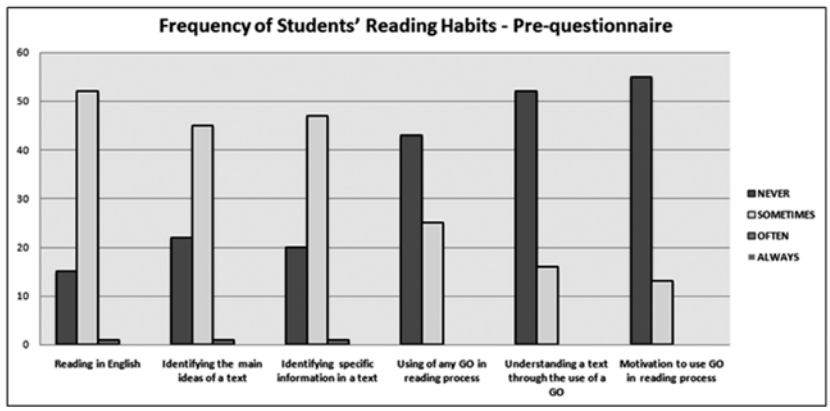


Figure 3. Students' initial self-measurements of frequency of reading habits

As it is illustrated in Figure 3, students reported that they *sometimes* read in English, and that they also were able to *sometimes* identify main ideas and specific information. However, it was clear that students made little use of GOs when reading and they *almost never* felt motivated to read in English using the GOs. Additionally, it is important to point out that none of the learners selected the category of *always* in the aspects related to reading in English, identifying main ideas, using the GOs, understanding a text using GOs or motivation for reading, and very few selected *always* in the three first aspects.

It is important to point out that during the application of the pre-questionnaire, some students asked about GOs explicitly, indicating that they were unfamiliar with graphic organizers or their use. However, when research teachers explained that it was a scheme that we use to organize information from a reading and that we were going to explain it with more detail after the pre-test, learners understood the idea and they made connections to their previous knowledge. They had already seen some schemes in Spanish class, so they could answer the questions about the relationship between the GOs and the frequency with which they use them in their own reading process.

In the post-questionnaire, it is possible to observe a notable increase in the frequency of students' reported reading actions on the categories related to reading skills, the use of GOs in the reading process, the understanding of a text and the motivation to use the GOs in reading. This is evidenced in Figure 4, which shows the frequency of students' reading habits in the post-questionnaire.

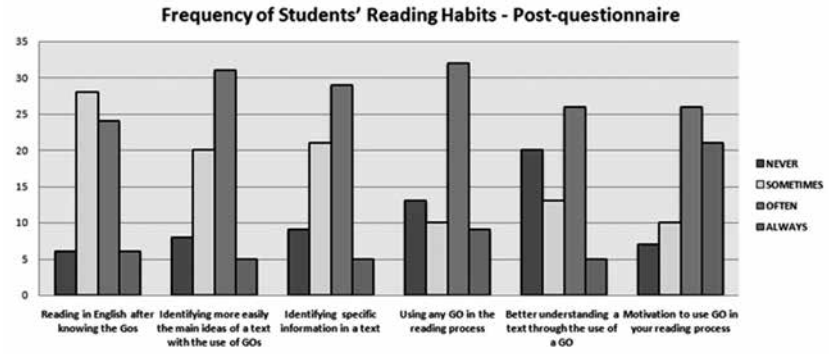


Figure 4. Students' self-measurements of frequency of activities, post-questionnaire

As Figure 4 illustrates, students reported in the post-questionnaire that they practiced reading in English with more frequency after the intervention, and that they also felt that it was easier to identify main ideas and specific information in a text. Further, learners reported using GOs often in the reading process after the intervention, and that they felt more motivated towards the use of the graphic organizers when reading in English. As seen in the Figure, the answer of *always* was the highest in the last question, related to

the motivation to use the GOs in the reading process. Also the category of *often* was the second highest in the use of any GO. Data indicate that after the intervention, the use of GO increased as well as student's motivation towards reading, and learners were more familiar with the process of their construction.

Additionally from the reflective journal notes, it was possible to determine that students understood the questions from the post-questionnaire because they did not ask for the clarification as they did on the pre-questionnaire. They knew the concepts and the vocabulary to which the questionnaire was referring. It is also important to point out that the frequency of *always* was selected for the first time, in contrast to the pre-questionnaire.

Part B of the pre- and post-questionnaires contained open-ended questions about students' personal skills and feelings towards their reading process, as well as personal strategies they use to approach texts. Students' responses indicate that their perceptions of their own reading process through the use of GOs improved after the intervention, and that GOs began to influence the way they faced texts in English.

In general, in the pre- questionnaire, it is possible to point out once again students' lack of familiarity with GOs at the outset. Further, the observations indicate that despite success carrying out the activities, most students still felt that it is important to know the meaning of every word and even to translate the entire text. Students reported that their reading skills in other subjects are good even though they have little time to read. In terms of the use of GOs in reading, learners affirmed that they are useful to comprehend the information in the texts.

Some answers to the questions of the post-questionnaire allow the researchers to understand that integrating GOs in the English class is also a useful way to learn vocabulary. Furthermore, students expressed that they felt more comfortable and that they understood more the activities of reading in English. Participants reported that they did not feel as confused as when they answered the pre-questionnaire, and that they felt more confident about their knowledge about how to read in English. Some students even mentioned the names of Story Map and Semantic Map in their answers. They referred explicitly to the strategies that they use for effective reading. Furthermore, the research-teachers stated in their journals, that learners after the intervention expressed that GOs were a very useful, necessary, simple and helpful strategy to read, that they would use them more frequently, and that they felt more confident and motivated to read in English with the GOs. A smaller number of students insisted on the importance of using the dictionary and knowing the meaning of every word.

ATTITUDES TOWARDS TEXTS FROM DIFFERENT CONTENT AREAS

In general, with the intervention and the activities developed in the pre and post-test, it was possible to observe that despite the variety of the topics of the texts, these were not

difficult for the students even though their lack of vocabulary was a continuous challenge. In terms of the usefulness of GOs for reading in other subjects, students stated that they found them helpful, especially for Spanish and Philosophy. However, students' lack of vocabulary and background knowledge, even in their first language, continued to present a barrier as in the text used during the intervention about the Nazca Lines in Perú. Some students checked the translation of the word *irrigation* and found *irrigación* in Spanish, but were still confused as they were unfamiliar with the term in their first language. Nevertheless, learners knew that this information was part of the possible origin of the lines, and they were able to write sentences to that effect in the correct part of the GO. This means that despite students' unfamiliarity with vocabulary and lack of background knowledge of certain concepts, they were able to deduce the correct location of the information.

In the second part of the post-questionnaire, students expressed that they realized that GOs are very useful to understand texts on any topic. They reported that they would use GOs in Spanish and Economics classes with the purpose of understanding the information more clearly. This indicates a very positive view of GOs. In fact, one of the reflective journals noted this validation of GOs:

> *While students were doing one of the exercises, the Economics teacher arrived to the classroom and looked for a moment at the students' work. Then after asking what they were doing, she said that it was a good idea for working the texts and the books in her class. Days later, students commented that they were using the Semantic Map in the reading of some texts in Economics class.*

With this, a first step was given and the researcher teachers could deduce that the attitudes towards different content subjects were positive, and that students had found a useful strategy to understand texts. In this way, during the activities and especially in the post-questionnaire, learners expressed an increase on the frequency in the use of GOs. They reported that they felt motivated to use them more often in future reading activities in English, and that they valued these schemes for reading in other academic subjects.

STUDENT CREATION OF THEIR OWN SCHEMES

One of the purposes of the project was to encourage the students to create their own GO schemes taking into account what they had learned about working with the Story and Semantic Maps. Despite the fact that students received instruction and information about GOs, they continued using the same structures. This was evident in the post-test, in which students were asked to create a GO for the reading about a Hindu Myth. Students tried to recognize the main ideas and to establish a hierarchical organization, but only a few of them were able to do this. Some learners only copied the literal expressions from

the text and used the same categories in the same order explained in previous activities. Research teachers could deduce from this that despite students' improvement, they need more practice to overcome the difficulties presented in those aspects, particularly to create their own schemes.

CONCLUSIONS

In this study, the use of graphic organizers, specifically Story and Semantic Maps, proved to be a very enriching tool to help learners improve reading comprehension, including in other subject areas, and increase motivation towards reading and use of GOs. Through this process, learners were more aware of GOs as a tool to develop meaning-making from a text, become familiar with the vocabulary and context, locate specific information, identify main and secondary ideas, and organize, summarize and categorize information. By doing this, learners were able to improve in overall reading comprehension.

Findings in this study correlate with the studies reviewed. Research on the use of GOs to improve reading comprehension has shown positive results. Most studies evidence that GOs help learners activate prior knowledge, recall and retain information, gain an insight into the text structure, identify as well as connect the main and secondary ideas of a text, create meaning of a text and improve their reading comprehension process (Chio, 2009; Cuevas, 2012; Jiang & Grabe, 2007; Khaki, 2014; Llumiquinga, 2011; Manoli & Papadopoulou, 2012, & Öztürk, 2012).

In addition, the use of GOs provided learners interdisciplinary reading practice. In this way, they were able to read, construct meanings, understand and summarize different subject area texts by using GOs. Learners reported in the post-questionnaire and test that they were able to comprehend and read different types of texts from other content areas such as social studies, math, and science. Studies on the use of GOs have indicated that this tool helps learners foster the building of vocabulary, comprehend and make texts easier, faster and more enjoyable for reading, particularly because learners are able to manipulate, make associations and connections with the content and understand the complex material content (Chiang, 2005; Goss, 2009; Maccini & Gagnon, 2005; Mann, 2014, & Rossie & Campbel, 2012).

Furthermore, the use of GOs increased students' motivation towards reading due to their increased confidence. They felt better prepared to approach a text. Particularly, learners stated in the post-questionnaire that they used the schemes to make connections between ideas and in this way make meaning easily. They were also able to understand and remember content. This implies that the success of using GOs helped students develop more positive attitudes towards reading. Studies on the use of GOs have manifested that this tool helps learners minimize difficulties in reading comprehension, decreases reading anxiety, boosting achievement and hence motivation (Khajavi & Ketabi , 2012; Mede, 2010, & Sharpe, 2013).

A limitation of the present study was the need to provide learners more time in order to create their own schemes. The research teachers noticed that students required more practice and training to develop their own GOs. In terms of further research, it would be important to identify other GOs that might be suitable to different text types as well.

ACTION PLAN

This research could be extended and could increase the findings related to the implementation of GO in public schools where English is taught as a foreign language. The following points are suggested for researchers and teachers:

- Develop and reinforce reading as a skill in the foreign language, not only with eleventh graders, but also from sixth grade.
- Use GOs during reading practice.
- Motivate the reading process through dynamic practices in class that help learners to understand and learn English more successfully.
- Exchange experiences about reading in order to increase motivation towards reading.
- Understand that despite each student's individual rhythm, all of them can find in GOs an easier and more enjoyable way to learn.
- To develop autonomy in the use and implementation of GOs, more time is needed. Students need more time and practice. With continuous scaffolding, they can use this strategy on their own.

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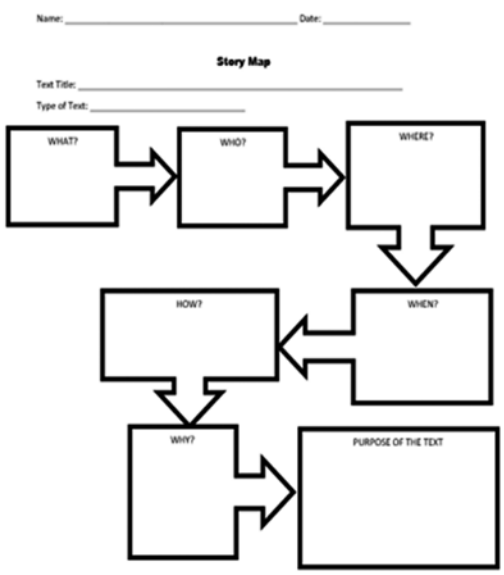
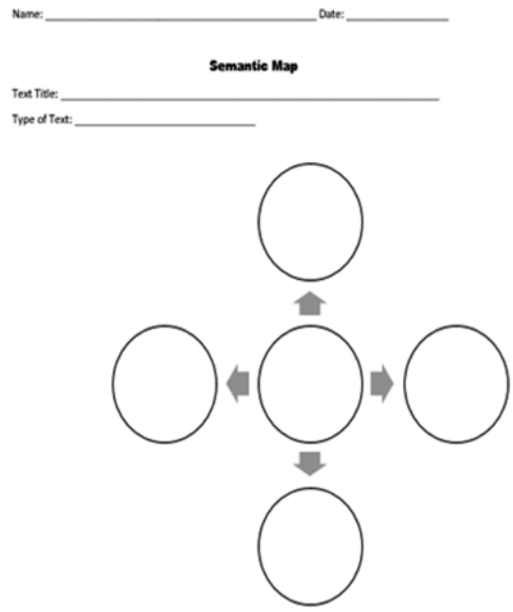
APPENDIX A

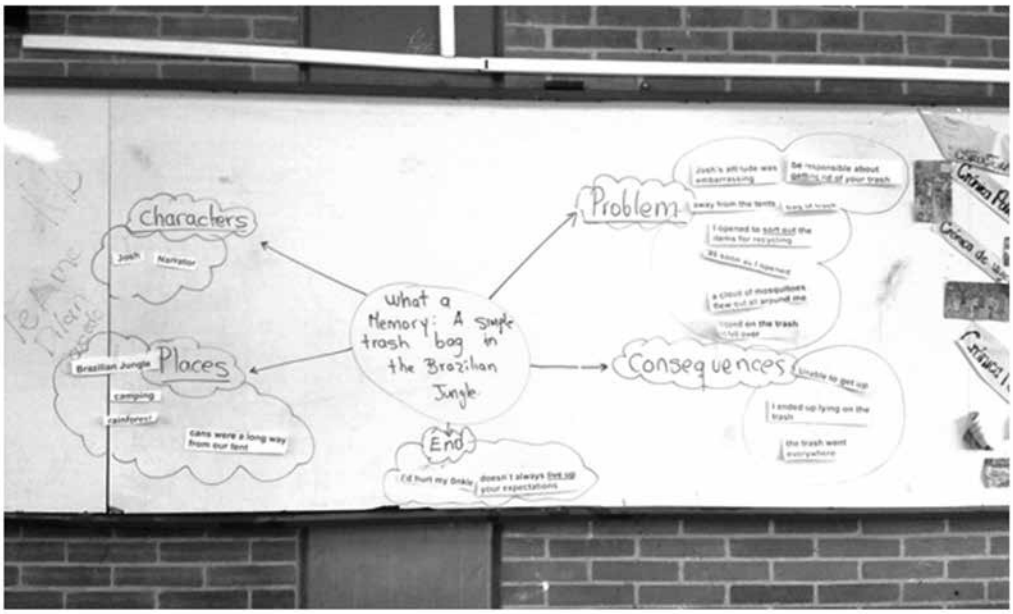
GO MODELS

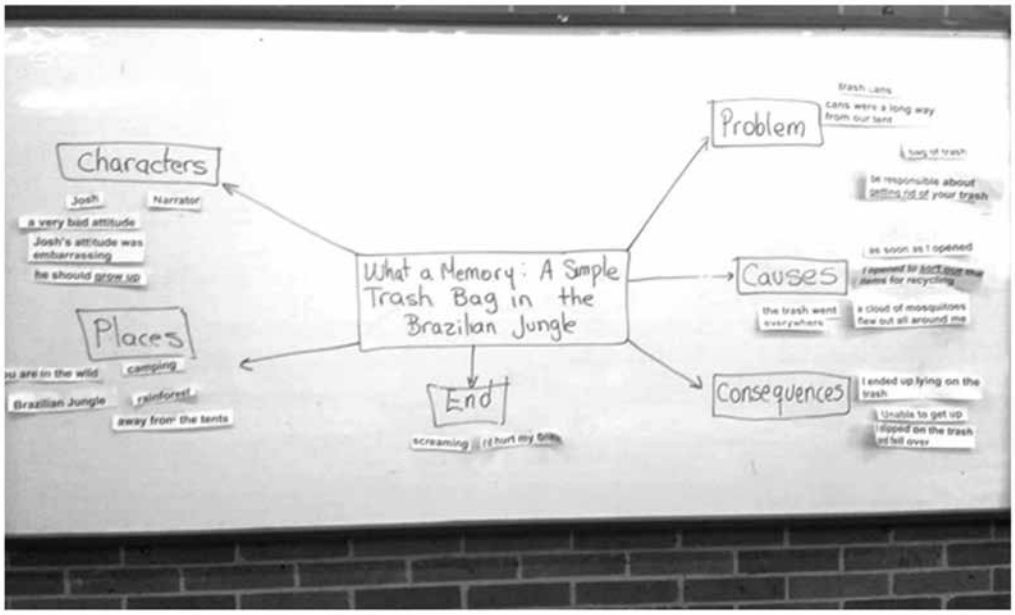




APPENDIX B

GO GROUP WORK ON THE BOARD





APPENDIX C

RUBRIC FOR ASSESSING THE PRE- AND POST TESTS

Assessment Criteria	Asesment Scale			
	Excellent	Good	Fair	Poor
Identification of the main ideas of the reading. (Identify the main and the secondary ideas of the text)	All the main ideas of the reading are identified clearly.	Almost all the main ideas of the reading are identified clearly.	Only some of the main ideas of the reading are identified clearly.	Any idea is identified clearly.
Recognition of the key words. (Recognize the most important vocabulary in the text)	All the key words are written in the schema.	Almost all the key words are written in the schema.	Only some of the key words are written in the schema.	Any key word is written in the schema.
Organization of the content. (Locate the content or the information in the correct chart)	The whole information is located accurately inside the charts.	Almost all the whole information is located accurately inside the charts.	Only some of the information is located accurately inside the charts.	The information is not located accurately inside the charts.
Hierarchical organization. (Write the information considering the correct importance order)	The whole information is written according to the importance order.	Almost all the whole information is written according to the importance order.	Only some of the information is written according to the importance order.	The information is not written according to the importance order.
Writing Format. (Write the ideas with appropriate grammar and spelling)	There are not grammar and spelling mistakes.	There are almost no grammar and spelling mistakes.	There are not spelling mistakes but there are some grammar mistakes.	There are grammar and spelling mistakes.

CHAPTER 5

EFFECTS OF EXPLICIT TEACHING OF METACOGNITIVE READING STRATEGIES ON FOURTH GRADERS' STRATEGY AWARENESS AND USE

ADRIANA MENA GIRALDO

Research strongly indicates that students who utilize strategies consciously consistently obtain higher performance and outcomes in academic work. Particularly with skills like reading, students who tackle texts with this awareness in hand can deepen their understanding and control of the actual task. Nevertheless, metacognition is often reserved for older students. Fourth grade teacher Adriana Mena was interested in finding out to what extent younger learners might be able to learn and consciously apply reading strategies following the PROMISE model. Her findings indicate that even young learners can become aware of reading strategies and can apply them consciously and in a discriminating fashion, selecting the most useful of the strategies for their own purposes.

ABSTRACT

Metacognitive skills have been considered to be crucial in the learning process. There are many proposals for teaching learners how to monitor, control and evaluate comprehension in a systematic and explicit way. The purpose of the present study was to implement a structured technique for reading strategies called "PROMISE." This structured plan involved the development of pre-, during-, and post- reading strategies to analyze texts. The teacher-researcher guided students on how to activate prior knowledge, brainstorm inquiring questions, monitor comprehension, reflect upon main ideas, and evaluate author's purpose. By the end of a five week period, the teacher scaffolding was slowly removed so that students would use the strategies independently. Data on students' use and awareness was collected in surveys and interviews. Findings demonstrate that students consider most of the reading strategies helpful for understanding and preparing them for what they were about to read.

Key words: Reading strategies, Metacognition, Reading comprehension

RESUMEN

Las habilidades de metacognición han sido consideradas cruciales en el proceso de aprendizaje. Existen varias propuestas para enseñar a los estudiantes cómo monitorear, controlar y evaluar la comprensión de una manera sistemática. El propósito del presente estudio fue implementar una técnica estructurada de estrategias de lectura llamada PROMISE. Este plan estructurado incluyó el desarrollo de estrategias para analizar textos antes, durante y después de su lectura. El profesor-investigador guió a los estudiantes para que activaran el conocimiento previo; hicieran lluvia de ideas realizando preguntas; monitorearan la comprensión; reflexionaran sobre las ideas principales y evaluaran el propósito del autor. Al final de un periodo de cinco semanas, el acompañamiento de la profesora fue retirándose gradualmente para que los estudiantes usaran las estrategias independientemente. Se recogieron datos sobre el uso y conocimiento de los estudiantes, mediante encuestas y entrevistas. Los resultados demuestran que los estudiantes consideran que la mayoría de las estrategias de lectura trabajadas fueron útiles para la comprensión y para su preparación antes de enfrentarse un texto.

Palabras clave: Metacognición, Estrategias de lectura, Comprensión, Evaluación, Lectura

Second language students not only learn how to decode a new language. They are also required to interact with different texts, use them for specific purposes, and interpret, summarize, analyze or compare them. In order to be proficient readers, students need to develop these abilities with a considerable level of autonomy. This is why they need to be able to use certain tools or strategies that enable them to control their comprehension. Studies demonstrate how students become successful readers by using specific strategies and also by consciously applying metacognitive hints that enable them to plan, control and evaluate the way they are using those strategies. If students are taught metacognitive awareness concerning the purpose and usefulness of a strategy as they are taught the strategy, they are more likely to generalize the strategy to new situations.

The purpose of this study was to discover if fourth graders at the *Gimnasio La Montaña* were aware of metacognitive and other reading strategies**,** which metacognitive strategies they used while reading in English, and if they considered these strategies to be useful enough to help them understand a text in different contexts. The study replicated a metacognitive teaching model built by a fourth grade teacher who went beyond the "rigid sequential models of PQ4R (previewing, questioning, reading, reflecting, reciting, and reviewing" (Stephen, 2005). She structured a model to teach metacognitive skills while reading, called PROMISE. "I surmised that students respond best to something they can easily internalize, which meant simplifying the vocabulary" (p. 243). PROMISE is an acronym that groups traditional text comprehension processes under the umbrella of commonly researched metacognitive processes (Israel, 2005). PROMISE stands for Prior knowledge, Reflection, (Organizational) Overview, Monitoring, Inquiry, Sensitivity, and Evaluation.

The study intended to implement metacognitive skills using not only these strategies but also others such as planning, controlling, evaluating before reading, visualizing, questioning, and building text-self connections. The researcher collected information about students' opinions and awareness before and after the five-week implementation, along with class observations through a reflective journal and samples of student work. It allowed the researcher to verify if students were aware of the reading strategies and if they were actually helpful for them, to apply in new contexts.

After applying the PROMISE thought web, students not only evidenced knowledge and use of the reading strategies taught in Spanish class (contextualization and use of synonyms), they also gained knowledge about the use of the PROMISE strategies. Students could work them out before, during, and after reading four reading texts, leading them to increase vocabulary, comprehension, and to interact actively with the text. In addition, most students reported positive feelings towards the use of these strategies because they considered them useful to better understand the texts. Further, students' awareness was raised about each stage of the metacognitive strategies taught. Moreover, during the post-task activity and the Think Aloud interview, students were more confident to develop each strategy, filling in the web with more ideas than they did in their first tasks.

LITERATURE REVIEW

Different studies support the idea that teaching metacognitive skills and explicit teaching of reading strategies result in an increased level of reading comprehension, better use of vocabulary, and explicit use of strategies by students between 8 and 12 years old.

EXPLICIT INSTRUCTION OF READING STRATEGIES

Some studies reviewed were carried out through direct intervention of explicit strategy instruction over a period of time, in some cases contrasting results in control and experimental groups. Different studies sought to identify how structured programs on metacognitive strategies could benefit students' reading comprehension by contrasting pre- and post-test performances of students. There is a common finding in these studies evidencing the positive impact of these interventions. Students in experimental groups generally gained confidence in using reading strategies in order to understand different texts. Moreover, students reflected better recognition of vocabulary by following the strategies learned. The studies implemented different reading strategies, providing the student with both knowledge of cognitive processes and strategies so they could use them as metacognitive knowledge. All of the research of this type reviewed evidenced significant increases in reading comprehension, identification of vocabulary, or metacognitive skills (Gooden, Carreker, Thornhill, & Malatesha 2007; Littlefield, 2011; Muñiz-Swicegood, 1994; Ozturk, 2015; Radcliffe, 2008; Royanto, 2012)

Gooden, et al. (2007) analyzed how explicit vocabulary instruction using strategies such as generating synonyms, antonyms, and other related words gained greater increase in vocabulary measurements compared with students who wrote down the words and used them in a sentence in the traditional way. Further, Littlefield (2011) found evidence about the importance of including both motivational practices in the classroom and explicit instruction to increase reading outcomes. Motivation was measured by journal entries about the possibility of having meaningful choices in their reading texts, and explicit instruction was given about how to build summaries. Littlefield found that this implementation produced significant increases in expository text comprehension.

In the same way, Royanto (2012) conducted an experimental intervention based on scaffolding, using reciprocal teaching, peer tutoring, and home reading. This was based on Vygotsky's theory, which assumes the importance of expert roles in helping novice students. Significant differences can be seen in strategies such as asking explicitly, verification, and wrong conclusion compared with the control group. It also indicated that by taking the role of scaffolders, teachers or peers could help novice readers to reduce the zone of proximal development by providing cues, prompts, modeling, asking questions, and discussing.

Further research provides evidence about the impact of explicit teaching of metacognitive strategies (Muñiz-Swicegood, 1994). This study reports the implementation

of a program with 95 third-grade bilingual Spanish students. The experimental group was trained to use metacognitive reading strategies (self-generated questioning) for 90 minutes each day during a six-week Spanish reading period. Control group students, on the other hand, were instructed with third grade Spanish basal readers. The bilingual Spanish dominant students in this experimental study were taught to use metacognitive reading strategies while reading in Spanish. The metacognitive reading strategy with these participants was the development of self-generated questioning strategies. The teacher modeled how to produce a variety of questions in regards to comprehension of a story or text passage that is about to be read. Then, students worked in groups, following the model. Weeks after, they were in pairs, building a dialogue in which they had to ask their own questions. After six weeks, following training in metacognitive Spanish reading strategies, Spanish dominant bilingual children improved in the area of reading performance on the *La Prueba* Spanish reading test and the Iowa Test of Basic Skills English reading test.

Another study with third graders implemented metacognitive skills in an explicit way (Ozturk, 2015). This study worked with six third-grade classrooms. The experimental group was trained on metacognitive strategies directly for a period of five weeks. One of the classes developed a structured program, including explicit reading strategies and metacognitive hints. Metacognitive strategies were taught in five stages. First, the teacher used background knowledge, activating students' interest with pictures or real objects. The vocabulary was introduced using semantic webs, relating the new word with synonyms, antonyms, and other related words. After that, the teacher prompted students to brainstorm answers to given questions. Then, while reading, the teacher asked students to "think aloud" and report whether their predictions were supported or not. They were encouraged to vocalize and use expressions like "Yes," or "Oops," or if they learned something new, they could exclaim, "Wow," or "Aha." The first week, the teacher read the text. Then, students and the teacher read together. Finally during 4th and 5th week, students could read the materials silently on their own. Finally, the teacher used a figure of a pyramid to place main and supporting ideas of the text. In this way, students received a model to follow in order to summarize. They also were asked to write the summary with the fewest number of words, clarify details, and define vocabulary using context. The experimental group out-performed the control group taught via the traditional literacy method, both in vocabulary and reading comprehension. They showed a significant difference in vocabulary and reading gains attributed to the metacognitive intervention.

Another direct instruction intervention demonstrated the benefits of explicit teaching strategies to two seventh-grade language arts classes (Radcliffe, 2008). The study sought to discover if less-proficient readers in seventh-grade language arts classes would improve their reading comprehension by applying the VITALS (Visualizing, Interacting, and Thinking while Applying Literacy Strategies) technique. Radcliffe found that using VITALS might be an effective curricular intervention in classrooms where less-proficient students are homogeneously grouped, as well as in classrooms where students are heterogeneously grouped, as the proficient readers' performance was not negatively impacted by the intervention.

THINK ALOUD TECHNIQUE

Other interventions were tested by interviews and class observations since their purpose was to check feelings and the way students and teachers use metacognitive strategies. One of the techniques used to collect this is "thinking aloud." The think aloud protocol is a technique in which students verbalize their thinking as they read and thus bring into the open the strategies they are using to understand a text. Baker (2002) describes how this metacognitive awareness (being able to think about one's own thinking) "enables learners to assess their level of comprehension and adjust their strategies for greater success" (p. 34).

Several studies have shown that students who verbalize their reading strategies and thoughts while reading score significantly higher on comprehension tests (Baker, 2002; Baumann, Kessell & Jones, 1992). Both conducted two different observations with the same kind of purpose: Baker interviewed students of third and sixth grade in France. The study wanted to know students' perceptions about who a good reader is. Third graders considered the speed and the accuracy when reading aloud as characteristics of proficient readers while fifth graders thought good readers are the ones that understand the text. Researchers also found that fifth graders did not use the strategy of going back in the text in order to understand although they recognized it as one of the strategies. This suggests that students were not consistent applying the strategy although they were aware of it. Both third and fifth graders identified lack of vocabulary as a cause of misunderstanding when reading (Baker, 2002).

In the same way, Baker wanted to know if metacognitive skills of students in third grade changed with time and age. She interviewed German students who scored high in reading metacognitive skills when they were in third grade. She found that it did not change significantly with age and time. Children who were not interested in reading in third grade continued obtaining poor results in comprehension in tests later in high school. Correspondingly, Baumann, et al. (1992) analyzed the effectiveness of applying direct instruction in "thinking aloud" as a way to improve elementary student's reading metacognitive skills. They conducted the study with 66 fourth-graders, who were grouped in experimental sessions as follows:

1. Think-Aloud (TA) group, in which students were taught various comprehension monitoring strategies for reading stories (e.g., self-questioning, prediction, retelling, rereading) through the medium of thinking aloud.
2. Directed Reading-Thinking Activity (DRTA) group, in which students were taught a predict-verify strategy for reading and responding to stories.
3. Directed Reading Activity (DRA) group, an instructed control, in which students engaged in a non-interactive, guided reading of stories. (p. 143)

Baumann et. al (1992) describe how although there is evidence that elementary age students can be taught comprehension monitoring abilities, "no think-aloud intervention

research has been done with students below Grade 7; therefore, younger students (fourth graders) were chosen as subjects" (p. 146). In their study, students from the first group (TA) achieved higher scores in comprehension on both the Nelson-Denny Reading Test and the Metropolitan Achievement Test. This was a modeling-plus-explanation group compared to the other three groups, which did not differ significantly from one another. Analyses of the think-aloud protocols for the Metropolitan Achievement Test passages revealed that students in the modeling-plus-explanation group produced more think aloud of any kind (target strategies plus others) than control group subjects (Baumann, et., 1992).

INTERVIEW AND OBSERVATION TECHNIQUE

Researchers have also attempted to evaluate elementary teachers' awareness of the importance of metacognitive strategies or the use of explicit reading strategies in their reading lessons. Gerald (2002) carried out a case for direct explanation of strategies. He implemented training for teachers on explicit instruction of reading strategies. Teachers were interviewed twice during a year-long period and monthly observations were carried out. More extensive instruction was provided for teachers in the second experiment. Duffy found that direct teaching of comprehension strategies was minimal. At the same time, the teachers reported teaching reading comprehension strategies. Some of the teachers did mention strategy use but did so in a passive manner without actively and directly teaching the strategies. Some teachers felt like they taught the use of the strategies by using summarizing, predicting, and imagery as an assessment tool. This, however, does not validate that students used the strategies during the act of reading text. "While some teachers used these more often, most of the teachers did not believe it necessary to see that the students were aware of the use of such strategies" (Gerald, 2002 p. 32). Researchers found that the experimental group outperformed control students on a standardized test, and performed significantly better on achievement gains during the school year and on the state assessment test.

Another study that intended to use the "think aloud technique" is the one implemented by Donndelinger (Israel, 2005) using PROMISE, monitoring, inquiry, sensitivity, and evaluation. In this model, prior knowledge is the foundation of metacognitive reading. Maintaining awareness and constant reference back to one's prior knowledge enable all other process. Overviewing based on prior knowledge and the anticipation of new knowledge are critical for setting up a successful comprehension effort. These help verify the reader's purpose while generating the questions that will drive inquiry. Finally, reflection is its retrospective counterpart. Reflection drives the summary and synthesis of details into main ideas and themes from which further evaluations and inquiry may be made (p. 244). These processes are not intended to be separated.

METHODOLOGY

CONTEXT

The context of this study was the *Gimnasio La Montaña*. This is a private school located in Bogotá, Colombia. There are nine classes in elementary school, from second to fourth grade. Each class has about 23 boys and girls. Most students have been in the school since preschool, following an English language immersion program; i.e., students have six English classes, and science, math, art, music and homeroom classes are also taught in English. The homeroom teacher is also in charge of teaching math, English and science. Most of the families in the school are familiar with English-speaking contexts although they are not native speakers.

For teaching reading, the school follows the theoretical framework based on the book *Teoría de las Seis Lecturas* (Samper, 1996). It is used in both the Spanish and the English language curriculum. The framework proposes the study of the *phonological* stage in preschool, followed by *primary codification* in elementary and *secondary codification* in high school. In elementary grades, there are three main decoding strategies: use of synonyms, contextualization, and identification of basic words. The use of these strategies enables students to recognize propositions within a text, and then build up the text structure. Since the present study sought to verify the usefulness of reading strategies and whether students were aware of how and when to use them, it was interesting to analyze the implication of learning these strategies not only in Spanish but also in English classes.

The participants of this study were the children of fourth grade "B," at the *Gimnasio La Montaña*. There were 12 boys and 11 girls, age 10. They were studying English as a second language. Their reading proficiency allowed them to obtain average scores in the IOWA basic skills test.

DATA COLLECTION INSTRUMENTS

The following are the instruments used in the study:

Reflective teaching journal. This journal was based on informal classroom observation. The teacher recorded her observations during reading time. She described which strategies the students used while reading not only in English but also in science class.

Pre-task /Pre-questionnaire. These were carried out in order to establish a baseline description of students' strategy use and awareness. The class read the text individually, and the teacher stopped them for a while to ask them about the strategies they knew and used to address difficulties. They took turns to answer each one of the following questions, in Spanish:

1. What are you thinking about?
2. Did you find something that was not clear? How did you overcome this?
3. Which word was difficult to understand? Did you try to find out its meaning?

Then, the teacher asked students to answer some questions about the knowledge about those strategies. The goal of this pre-questionnaire was to obtain information about students' knowledge of the identification and use of strategies while reading. Questions included the following:

1. Which techniques do you know that may help you to understand a text in English?
2. What do you do before reading an English text?
3. What do you do when you find unknown words or ideas that make it hard to understand a text in English?
4. What do you think while reading a text in English?

The results shed light on students' opinions towards the problems they faced when reading a text in English.

Intervention. The intervention proposed in this study consisted of a series of lessons designed to teach metacognitive and reading strategies in an explicit fashion. As the strategies were introduced through several weeks of lessons, teacher scaffolding was slowly removed so that by the end students might use the strategies independently. The teacher implemented a modeling-explaining intervention throughout a five-week period, working with three different texts, selected from the students' textbook. Students had the possibility to work on a thought web, first with the guidance and modeling of the teacher, then they recorded their thoughts in small groups; finally, they did it individually, completing their own thought web.

The teacher introduced the meaning of the PROMISE acronym to the class, and then guided students on the use of each stage. She modeled the way to take notes before, during, and after the first reading, on a format (Appendix A). The teacher chose an informative text about ants. She was reading and thinking aloud, her ideas guided by each of the introductory lines. For example, "I already know about ants: I know they are …" The teacher projected the web on the board and filled it out as she explained each of the steps. For the second reading, students worked in groups of three, helping each other to fill in the format. The teacher monitored and observed, encouraging students to write down their ideas, and clarifying what they should do as they were reading. They could also use the model used by the teacher in the previous step. The teacher could see their responses and ideas towards the text, and compared this with further exercises. For the third reading, students recorded their responses orally, towards each stage.

Staggered post-task with follow-up questionnaire. After carrying out the intervention over a period of five weeks, the class read a text and responded to a questionnaire

about their knowledge of strategies and whether they were useful when solving a problem. The purpose of these online questions was to know if students used the strategies they were taught, if they knew which ones they used, and if they believed they were helpful for them while reading a text in English.

DATA ANALYSIS AND INTERPRETATION

Pre-task /interview/ questionnaire. The survey was conducted through the "Survey Monkey" platform. Students answered the questionnaire online and the data was retrieved, tabulated and graphed by the program. Then, the researcher analyzed each of the questions, contrasting students' answers with their responses during the interview. The researcher asked herself if students' responses were supported by their performance within the pre-task or not, finding coincidences with their answers in the survey.

Reflective journal. The teacher recorded her observations through three journals, describing main responses of students towards the use of reading strategies before during and after reading a text. At the end, these journals were analyzed finding similarities and differences before and after the implementation. These journals also evidenced students' reactions towards the use of the PROMISE strategies.

Intervention. During the intervention, the teacher recorded perceptions in the reflective journal. During the intervention, when students completed the readings using the PROMISE stages, the teacher analyzed their responses, identifying the frequency in which each stage was used while reading a new story. In the fifth week, students worked individually reading a new text, and fulfilling another format on their own. The teacher analyzed students' responses and performance along the fifth week intervention. She described the quantity and quality of their answers in each stage.

Post-task /interview/ questionnaire. Students took a final survey in which the same questions were asked as in the pre-stage, plus others related to the knowledge of PROMISE strategies. These included open questions asking whether or not students used the strategies, and which. Furthermore, students completed a reading task in which they were stopped and asked about the way they were thinking while reading. The teacher analyzed each question, finding out similarities and differences between students' answers and their performance within the reading task and interview. In addition, the teacher contrasted the results of students` answers in the pre- and post-intervention data. These observations were complemented with those from the reflective journal.

RESULTS AND DISCUSSION

Fourth graders at *Gimnasio La Montaña* school replicated the structure of a thought web using the PROMISE reading strategy technique for five weeks, in which they not only applied traditional metacognitive strategies such as visualizing and using the dictionary, but also built connection with the texts by activating prior knowledge ideas, brainstorming inquiry questions, monitoring their comprehension and expressing their feelings towards the author's ideas and tools. After using these PROMISE strategies, most students were better able to express ideas about the text, and they could also take decisions in order to express the meaning of sentences or words found in the text. Nonetheless, there were students who considered they would be able to understand the text even if did not use the strategies. Some of them considered that some of the strategies may be skipped.

COMPARISON OF THE PRE- AND POST-INTERVENTION WITH PROMISE

Comparing the pre- and post- performance while reading a text, we can report the following findings. The use of contextualization and visualizing strategies were consistent in both moments. Students tended to re-read the paragraphs in order to obtain hints or clues that may help them understand the meaning. These strategies had been introduced and taught in Spanish class. The difference in the pre-and post-intervention with the PROMISE thought web came when students also used prior knowledge, monitoring, inquiring and evaluating as metacognitive strategies.

Another result evidenced during the interviews and teacher journals was the amount of ideas learners came up with. During the pre-task and first exercises, students mentioned fewer thoughts about their comprehension or interactions with the text while at the end, students felt confident enough to brainstorm more questions and previous ideas about the text. Students also increased their participation when they were asked to come up with inquiry questions or evaluation of the author's ideas.

However, students tended to only use the strategies when the teacher asked them to do so. Otherwise, some students preferred to read and check unknown vocabulary or just keep reading even if they did not understand. Some students also mentioned they could read and understand the text without using the strategies.

KNOWLEDGE OF METACOGNITIVE STRATEGIES

The study sought to find out if fourth grade students were aware of metacognitive and other reading strategies. The results of the survey, as well as the pre and post tasks showed that most students clearly identified the metacognitive strategies taught in Spanish class: use

of synonyms and contextualization. After the implementation, students also evidenced how they became more familiar with "Prior Knowledge" "Monitor," "Inquiry," and "Evaluation" strategies. Their performance during the first task filling in the web was poorer since learners were just beginning to become familiar with each strategy. At the end, students brainstormed more ideas according to each strategy, independently. They also answered a survey in which they identified the name or kind of strategies they had used in both English and in Spanish classes.

Students reported mostly the use of visualizing, contextualization, and synonyms. When they were asked to identify the strategies taught through the PROMISE model, most students were correct in recognizing the name of the strategy with the kind of thought it is related to. Students were asked to match the name of the strategy with the introductory sentence worked within the web format (Appendix B).

USE OF METACOGNITIVE STRATEGIES WHILE READING

Results recorded through teacher journals and pre- and post-interviews demonstrated the following findings. During the pre-task, almost all students said they re-read the text although a few admitted that they asked a classmate. The same number of students chose the option of using the dictionary or using the morphology of the word, which means they used suffixes and prefixes to understand the meaning.

This result coincides with students' performance and answers within the task. Most reported that they had to read the sentences again when they struggled to understand the idea. Less than the half the students, 6 out of 18, chose the option of looking for related words in the context of the unknown word. However, this was the strategy many students reported as the one they used when developing the pre-task along with rereading the text. By the way, most of the students' answers were correct when they answered the corresponding reading comprehension questions. There were more students understanding the meaning of unknown ideas, inferring their meaning.

After the implementation with PROMISE, most students reported that they tended to re-read sentences, followed by the use of clues around the idea. Fewer students mentioned that they used the dictionary or parts of the words as tools to help them understand the text. These results are supported by their comments during the interview. Students were asked to stop the reading and answer the think aloud prompts:

Teacher: What do you do when you do not understand this idea?

Student A: I think I have to read the paragraph again because I am lost.

Student B: I imagine what is happening in the text, about the dinosaurs. It was good for me to have the ideas before reading because I know that the text is about dinosaurs and fossils, and we went to Villa de Leyva and learned many things about them.

Useful strategies. Most students chose Prior Knowledge as the most important strategy, followed by Monitor and Overview. The less chosen were Inquiry and Sensitivity. When students were asked why, different students reported that these strategies "helped me to understand and to be prepared for what we are going to read." Monitor was used because it helps them to understand what they learned and to evaluate what they liked from the text. In general, students were open-minded when they were asked to use the PROMISE format. They also pointed out the importance of making a connection to the text by finding out prior knowledge and inquiry questions.

When asked why the reading strategies were important, students answered the following:

> *Because we have to understand the ideas while we are reading and we have to think about what we are learning.*
>
> *They help me to better understand what the text is about.*
>
> *Because I may be know what the text is going to be about.*

However, some students also considered there are unnecessary stages such us Reflection and Sensitivity. They argued that they can understand the text even if they do not follow these stages.

CONCLUSIONS

The purpose of the present study was to teach metacognitive reading strategies in an explicit, structured way, to students of fourth grade at *Gimnasio La Montaña*, replicating the PROMISE thought web. The main findings after teaching and applying PROMISE showed that most students were better able to express ideas about the text and could also take decisions in order to understand the meaning of words and sentences. Results of surveys and interviews also showed that most students clearly identified metacognitive strategies taught in Spanish class, including the use of synonyms and contextualization. Additionally, students evidenced how they benefited from brainstorming ideas about "Prior Knowledge" "Monitor," "Inquiry," and "Evaluation" strategies. Nonetheless, there were students who considered they would be able to understand the text even if without using these strategies. Some of them considered some of the strategies may be skipped.

Different research on explicit teaching of metacognitive strategies has also shown positive results. Most studies evidenced a relevant increase in reading comprehension, identification of vocabulary or metacognitive skills (Gooden, et al., 2007; Littlefield, 2011; Muñiz-Swicegood,1994 ; Ozturk, 2015; Radcliffe, 2008; Royanto, 2012). In the same way, the present study shows how students denoted more ideas when building on prior knowledge, reflecting, making an overview of text organization, monitoring, making inquiries, developing sensitivity to person, place, and style, and evaluating.

During class observations, the teacher noticed how students benefited from interaction with classmates. They used this while monitoring their comprehension because they could choose to "ask a buddy" when facing a problem when reading. In the same way, Royanto (2012), who conducted an experimental intervention based on scaffolding, indicated that by taking the role of scaffolders, teachers or peers could help novice readers to reduce the zone of proximal development by providing cues, prompts, modeling, asking questions, and discussing.

Another similar study that implemented reading strategies with Spanish speaking elementary students focused on the development of self-generated questioning strategies. The teacher modeled how to produce a variety of questions to understand a story or text passage. In this study, children improved in the area of reading performance on standardized texts (Muñiz-Swicegood, 1994). In the present study, although it was not possible to evidence these results, students certainly denoted more confidence answering comprehension questions when reading daily texts. Moreover, their results when answering the post task showed better results.

Some limitations of the present study were the use of the written thought web because some students were reluctant to write their ideas. Since they were asked to write these ideas in English, some of the participants limited their thoughts to oral expression. Another impediment was the demand of following the textbook planning, so it was not possible to work with the implementation in a sequential way. Further research needs to be done in order to identify if different levels of comprehension require different metacognitive strategies. It would also be interesting to find out how different reading purposes might demand different metacognitive strategies.

ACTION PLAN

Teaching metacognitive skills is a challenge for students and teachers. The use of the thought web provides answers for students who have special needs within the classroom.

- Teachers should implement this approach to metacognition instruction today in a consistent and explicit way.
- Students need to be encouraged to brainstorm and reflect ideas before, during, and after approaching a text.
- It is fundamental for students to keep on using reading metacognitive strategies not only in English class, but also in science and math lessons, as well as in future grades.
- The school should train teachers about the knowledge, use, and teaching techniques on metacognitive strategies in order to promote their use. This consistency will help learners use the strategies in an autonomous way.

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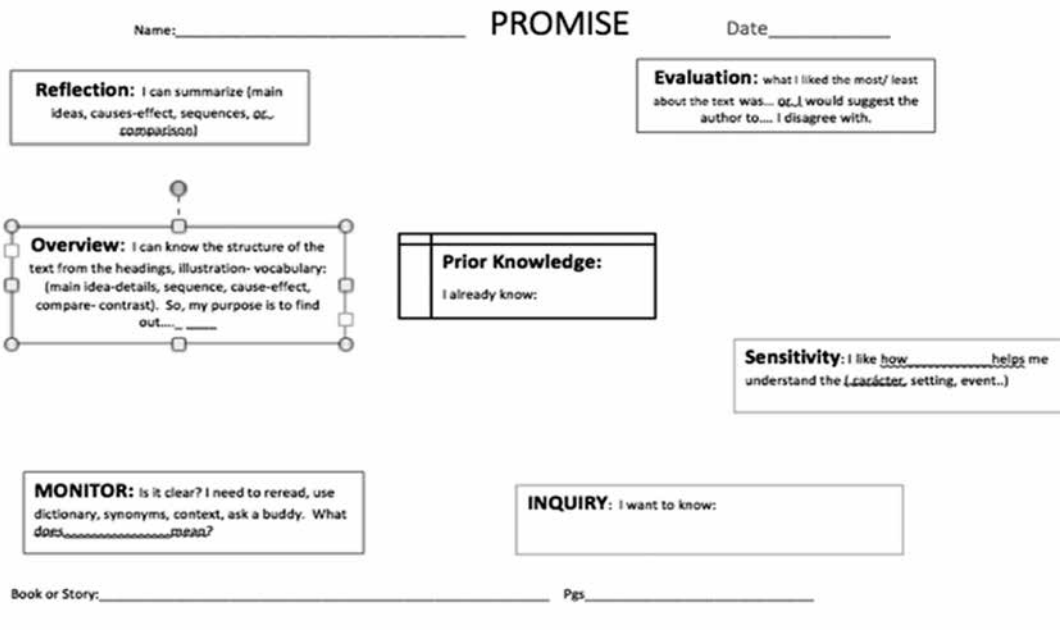
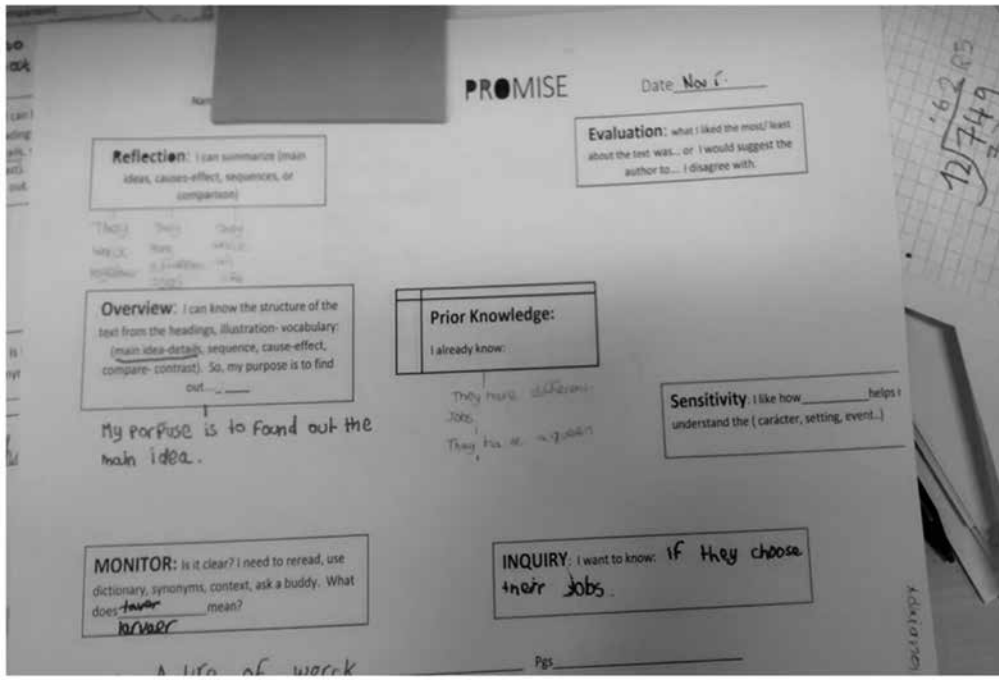
APPENDIX A

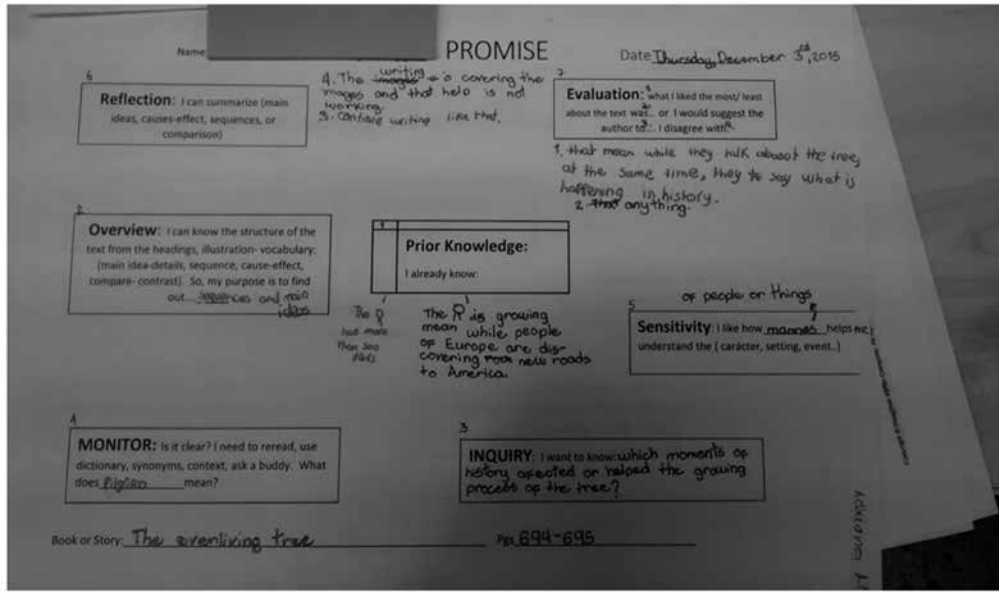
PROMISE FRAMEWORK



APPENDIX B

FIRST AND LAST TASKS WITH PROMISE





CHAPTER 6

CRITICAL THINKING ACTIVITIES TO DEVELOP CRITICAL THINKING SUB-SKILLS IN ELEMENTARY-LEVEL ENGLISH LANGUAGE STUDENTS

JOHN HAMES FORERO

Critical thinking is fundamental for today's citizens although many students leave high school without the ability to reason, distinguish fact from opinion, or justify their own decisions. Certainly, at the university level, and in teacher preparation programs, these skills become crucial as they impact the development of young people. Teacher Hames Forero lays a basis for explicit instruction in critical thinking sub-skills. The students in this study, first-semester English language learners at ÚNICA, benefitted from this instruction, which revealed the need for consistent, on-going development of specific critical thinking sub-skills throughout university education, especially in foreign language classes.

ABSTRACT

Critical thinking instruction, despite being a highly desirable trait in curricular planning and pedagogical practices, often represents a great challenge to course designers and teachers. In fact, attempts to measure critical thinking in a wide range of student populations have shown mixed results. This action research study measured the impact of systematic instruction of critical thinking sub-skills on a group of undergraduate students in a teaching licensure program in bilingual education. The teacher-researcher applied and documented a graded pedagogical intervention in the students' elementary level English class. By means of pre- and post-tests and focus groups, it was possible to document how participants assimilated this instruction and additionally how their perceptions towards thinking changed along the way. In terms of students' mastery of critical thinking subskills, the findings point to students' substantial difficulties making choices, as well as a widespread tendency towards relativism applied to decision making and judgment. Nevertheless, there was a clear increase in students' awareness of the usefulness of thinking critically. This action research validates the benefits of instruction on critical thinking in the English as a Foreign Language (EFL) classroom.

Key words: Higher order thinking skills, Critical thinking, Thinking instruction, Subskills of thinking, Facts vs. opinion, Appropriateness, Argumentation Analysis, Decision-making

RESUMEN

La instrucción en pensamiento crítico, a pesar de ser un rasgo muy aconsejable en la planeación curricular y la práctica pedagógica, a menudo representa un gran desafío para los diseñadores de currículo y los profesores en general; de hecho, algunos intentos por medir el pensamiento crítico en poblaciones extensas de estudiantes han mostrado resultados variados. El presente estudio de investigación-acción midió el impacto de una instrucción sistematizada de sub-habilidades de pensamiento crítico en un grupo de estudiantes de pregrado de una universidad bilingüe para profesores. El profesor-investigador aplicó y documentó una intervención pedagógica gradual en la clase de nivel elemental de inglés. A través de pruebas previas y posteriores, y grupos focales fue posible documentar cómo los participantes asimilaron tal instrucción y cómo sus percepciones sobre el razonamiento variaron a lo largo del estudio. En cuanto al dominio de sub-habilidades de pensamiento crítico, los hallazgos documentan una considerable sensación de dificultad para elegir; una amplia relatividad del juicio y de la toma de decisiones. No obstante lo anterior, hubo un claro aumento en la conciencia de la utilidad del pensar críticamente. Esta investigación-

acción valida los beneficios de la instrucción en pensamiento crítico en una clase de inglés como idioma extranjero (EFL).

Palabras clave: Habilidades que requieren procesos de pensamiento complejo, Pensamiento crítico, Instrucción para el razonamiento, Sub-habilidades de razonamiento, Hecho vs. Opinión, Adecuación, Análisis de argumentación, Toma de decisiones

In the current globalized world, innovative instructional trends such as 21st century skills, leadership training, cultural awareness, and critical thinking emerge as a vehicle for the creation of more effective educational scenarios. This study focuses on the instruction of critical thinking skills. Though most approaches in education aim at the development of critical thinking, its understanding can vary, especially when it comes to its implementation within curriculum and syllabus design. Particularly, implementing critical thinking is not easy. In some cases, it can be too ambitious or even too narrow in other cases. The British Council (2016) defines critical thinking this way:

> Self-directed thinking that produces new and innovative ideas and solves problems. Reflecting critically on learning experiences and processes and making effective decisions by avoiding the common pitfalls, such as seeing only one side of an issue, discounting new evidence that disconfirms your ideas, reasoning from passion rather than logic, failing to support statements with evidence and so on (p. 13).

Such an elaborate definition leads to the idea that thinking critically involves not only one mental process, but many subskills.

This study was developed under the premise that training students in effective critical thinking skills requires a clear understanding of this trait as well as consistent knowledge of the skills that underlie thinking critically. In other words, it is not possible to deliver effective critical thinking instruction under the assumption that educators know what it is, and that students are already equipped to think critically.

Therefore, teaching critical thinking in the scope of one semester, or even a year is an unattainable goal. Furthermore, the false assumption that adult students are ready to think critically makes the implementation of the critical thinking component in courses increasingly challenging. In the case of bilingual education, learners are expected to think critically and make such thinking visible in their speech and texts, in addition to the tasks involved in learning a foreign language. Consequently, it becomes necessary to describe students' command of such skills and also to scaffold critical thinking instruction.

This study works in two directions: diagnosing and scaffolding participants' critical thinking sub-skills. The stage of diagnosis aimed at documenting participants' views and decision making in reference to a series of scenarios, and to assess their ability to discern

facts from opinions. In addition, the scaffolded intervention sought to develop a higher level of awareness in participants' judgement and decision making skills. Both stages showed significant findings that constitute the outcomes of this study.

LITERATURE REVIEW

The development of thinking skills has at least two possible perspectives. The first claims a natural and linear development of the individual towards more elaborated abilities. An example of this is Piaget's framework, in which the child naturally climbs through the sensory-motor, pre-operational, concrete, and ultimately the formal operations stages. Under this model, an effortless evolution occurs together with aging (McLeod, 2009). Another vision proposes that formal instruction in thinking skills helps learners to evolve from earlier to more complex thinking schemes. Such is the case of Bloom's taxonomy, which posits that thinking skills can and should be formally taught on behalf of the achievement of higher order thinking skills such as critical and creative thinking (Elder, 2002).

These two views are not necessarily opposites; in fact, Klaczynski, Fauth, & Swanger (1998) claim that "formal operational skills and critical thinking are expected to correlate positively" (p. 189). Furthermore, they assure that "formal operational competence may be viewed as the cornerstone of good critical thinking" (p. 189). The nature of this action research understands the correlation between Piaget's development stages and thinking; nevertheless, it focuses on the intentional intervention on behalf of intellectual stimulation of higher order thinking.

THE NEED FOR THINKING SKILLS INSTRUCTION

Research consistently presents the need of instruction on thinking skills (Crandall, 2000; Sanchez, 2002; Shaila & Trudell, 2010). Shaila & Trudell (2010) found that students reaching higher education demonstrate insufficient exposure to activities that involve effective functioning in an EFL educational environment. Likewise, Sanchez (2002) explains the need for thinking skills-based curricula, presenting the individual's understanding of thinking processes as the unique pathway to upper stages of thinking operations and metacognitive skills.

Additionally, Crandall (2000) documented this need in teacher education, concluding that these students present important flaws in thinking skills and problem solving. "There is a growing sense that language teacher education programs have failed to prepare teachers for the realities of the classroom" (p. 35). All in all, an evident need for instruction in thinking processes is documented in varied educational landmarks.

Scenarios as varied as a bilingual university in Bangladesh, the Venezuelan school system, and teacher training colleges in the USA report similar problems. In terms of students' weak academic background, Shaila and Trudell (2010) comment, "They have only experienced teacher-centered instruction…[they] did not have the opportunity to develop metacognitive strategies to help them plan, and make decisions about their learning" (p. 2). Second, in response to students' poor command of higher order thinking, the Venezuelan government and schools made multiple efforts to develop thinking-skills-based instructional practices resorting to local, national and international aid (Sanchez, 2002). Third, Widdowson (as cited in Crandall, 2000) reports ineffective pre-service teacher instruction evidenced in poor problem-solving abilities and describes teacher training as "solution-oriented, while teacher education is problem-oriented" (p. 36).

THE LINK BETWEEN COGNITIVE AND THINKING SKILLS

There is a clear relationship between the development of thinking skills and academic performance. For instance, cognitive psychology states a strong link between math reasoning – analogical relationships, numerical series and logic matrices – in thinking skills such as inferring and issuing arguments (Carmona & Jaramillo, 2010). Besides, research demonstrates that young adults with a higher development of cognitive operations perform better at text decoding tasks (Chen & Shang, 2010). The literature also argues a correlation between rational thinking and formal operations that must coexist in order for effective problem-solving experiences and academic success to occur (Klaczynski, 1998). This scenario highlights the need for thinking-skills-based curricula (Sanchez, 2002; Shaila, 2010).

Quantitative research has also unveiled a possible correlation between cognitive and thinking skills. Carmona and Jaramillo (2010) and Chen and Shang (2010) reached this conclusion after using psychometric tests and standardized examinations. Carmona and Jaramillo measured students' progress in logic thinking operations such as reasoning, conceptualization, and judgement, which they consider necessary skills for inferring and issuing arguments The study used the Differential and General Aptitude Test, from its acronym in Spanish (BADG3) in pre- and post-intervention applications. Similarly, Chen and Shang (2010) used the structure of the TOEFL (Test of English as a Foreign Language) test and semi-structured interviews to assess students' use of cognitive operations in order to identify main ideas, locate details, and make inferences. The results display significant disparity in the scores of different proficiency level students, showing more proficient EFL (English as a Foreign Language) users as better readers and therefore more effective thinkers (Chen & Shang, 2010).

IMPLEMENTING THINKING SKILLS: THRESHOLDS AND CHALLENGES

Finding effective ways to implement thinking skills instruction within an educational system is another area of inquiry. Consistent training in critical thinking benefits not only cognitive traits, but also strengthens collaborative work, and EFL proficiency (Garcia & Molina, 2016). This study shows the positive affordances of systematic intervention in thinking skills. A glance at teachers' beliefs shows that the tendency is for teachers to provide high achievers with tasks appropriate for high order thinking skills, such as inferring and analyzing. This shows the underlying belief that low achievers simply cannot cope with more structured challenges, leaving them simpler tasks like memorizing and understanding information, and as such "denying them equal educational opportunities" (Zohar & Dori, 2003, p. 146). Other scholars have explored thinking skills in other scenarios; for example, learners facing an online learning environment are likely to develop critical thinking skills, which also help them overcome the limitations of distance learning (Bullen, 1998). In conclusion, an effective implementation of thinking-based interventions should consider learners' proficiency level, teachers' beliefs, and accommodation of existing instructional practices.

Studies also report that interventions in thinking skills' instruction have a positive effect on teaching methodologies and learning. Shaila and Trudell (2010) demonstrated how such implementation enhanced an already existing pre-university program. Crandall (2000) argues the need for a conscientious diagnosis of language teacher education programs in the United States. Furthermore, the Core Skills Framework applied by the British Council globally depicts critical thinking as a cornerstone domain to be developed in their professional development program for teachers (British Council, 2016). Locally, research needs to work similarly, exploring varied scenarios and courses of action from the ontology to the pragmatics of education, namely paradigms and didactics.

Institutions have found a positive impact in the implementation of thinking skills-based curricula and interventions. Garcia and Molina (2016) presented the impact of thinking skills instruction on the growth of self-directed learning among students in three different Colombian cities. Likewise, Zohar and Dori's (2003) revision of four studies in the Israeli context revealed inconsistencies in teaching practices due to teachers' beliefs. They propose that teachers be provided with the pedagogical means to help all learners reach higher levels of thinking, namely modeling of thinking procedures and peer learning assessment of thinking procedures. Bullen (1998) also posits the possibility of instructing in thinking skills in an online environment, which shows how instruction could be flipped in a face to face or a blended environment. In this way, class time on thinking skills training can be enhanced when following his model. All in all, one could easily observe beneficial results reflected in students' cognitive skills and hence academic performance.

As it has been discussed, critical thinking has been addressed mainly as an educational paradigm rather than as an instructional approach. Therefore, the present study proposes a way to work with critical thinking from its components and sub-skills in order to make it manageable and measurable in a classroom situation.

METHODOLOGY

CONTEXT

The context of this study was the *Institución Universitaria Colombo-Americana – ÚNICA*, a private teachers college in Bogotá, Colombia. Even though the English program is made of six English courses from A1 to C1 levels in the CEFR (Common European Framework Reference), there is an option to take an introductory level in first semester called English Intro for those students whose proficiency level is lower than A1. This course proposes sixteen hours per week of face to face instruction plus ten of autonomous work outside class. The class size varies depending on registration levels, but during the application of this study, 18 students were enrolled in the Intro class.

Most students at ÚNICA come from the Colombian public education system in which English language instruction is not a priority. Public school students traditionally score low on national standardized tests. Other students come from rural schools where curricula may feature a vocational or regional focus. As such, English language instruction may be as little as two hours per week. A smaller number of students come from informal high school validation institutes where a school year can be as short as 16 weekends.

Language lessons at ÚNICA follow the SIOP (Sheltered Instruction Observation Protocol) model. According to this model, lower level learners are required to have a high degree of class preparation and are exposed to the language through vocabulary instruction. Also, they are often involved in problem solving activities through interaction, negotiation and socialization of outcomes.

Traditionally, the English Intro class includes the support of an international teaching assistant who is involved in two weekly hours of supervised solo teaching and sometimes co-teaching. This teaching assistant carries out lessons that focus on pronunciation, vocabulary, and cultural awareness. The purpose of this practice is to provide learners with more direct exposure to North American culture in the framework of the Fulbright teacher exchange program.

PARTICIPANTS

The population participating in this study consisted of a group of 17 university students aged 17 to 23. At the moment, the intervention participants took a placement test as a university enrolment requirement which showed that they had a basic level of English (A1 or below in the CEFR). Their academic background implies ineffectiveness in previous EFL instruction and learning; evidence of this is that they are placed in the introductory level of English even though they may have taken at least six years of English in school.

Most of the students in this class were born in Bogotá, a smaller number come from other departments in Colombia, and one of the students was born and raised in Korea. Therefore, all participants are learning English as a foreign language. After taking a placement exam, they were placed in this level due to lack of basic command of English language skills.

The profile of the Intro student can be considered according to affective, learning and cognitive needs. Firstly, the affective needs refer to student motivation; in this regard, the average student is highly motivated, and has ambitious expectations of their learning process. It can be said that students in the Intro English course are intrinsically motivated. Secondly, their learning needs include their strategic learning, in other words whether they are effective learners. In this area participants barely meet the necessary standards for the university environment. Most of the group lacks effective study habits, and their understanding of the process of learning a foreign language is based on memory and grammar. Students' cognitive needs or academic performance are the most critical areas; most participants are unable to categorize ideas or differentiate main ideas from details. They also find it hard to infer patterns from contexts and in general have difficulties in solving tasks beyond the lower levels of thinking.

DATA COLLECTION INSTRUMENTS

As this study seeks to observe the impact of systematic intervention, data was collected from various sources: pre- and post- intervention tests on critical thinking subskills, field notes in an observation journal, and focus groups.

Entry test. In order to obtain information about the participants' command of the three critical thinking sub-skills proposed by Day (2003), namely the ability to differentiate between facts and opinion, to judge the strength of a given argument, and to assess the appropriateness of a solution to a problem. The chosen format for this was Google forms, which automatically scores, and tabulates participants' answers for further analysis.

As there was no available free test to measure these skills altogether, two specialists in psychology and quantitative research cooperated with the design and revision. Their consultancy focused on wording, validity, and reliability of the test. Later, a group of ten students from a different class in the same institution were chosen to take the test as a pilot trial. Their input helped refine the product before further application in the target population. The entry test served as a quantitative instrument to obtain information about participants' initial command of the abovementioned skills.

Exit test. After performing the planned intervention, an exit test was performed mirroring the entry test, and assessing exactly the same skills with similar scenarios. This new instrument followed the same patterns of the initial questionnaire regarding types and number of questions. Modified items ensured that students recall of the entry test questions

did not interfere with the test results preserving validity in the study. The help of experts in the field was also necessary in this design. This test serves as a quantitative source to document student progression.

Field notes. Research journals are widely used to document the results of interventions in an ethnographic fashion (Creswell, 2015). An audio journal served as an instrument to obtain detailed descriptions *in situ*. The later transcription, coding, and analysis of these research notes gave account of trends, individual progress, and particularities of the pedagogical implementation of lesson plans. To document these aspects, every completed intervention generated a journal entry.

Focus groups. These are considered as recorded sessions intended to unveil individual or shared understanding from specific people (Creswell, 2015). These sessions served as an opportunity to observe understanding of the key concepts and thinking routines proposed by the study; in other words, this served as a tool to measure effectiveness in the pedagogical implementation or intervention.

Consequently, two focus groups were carried out. The number of participants was limited to six, and were chosen at random. The questions were designed in order to inquire as to participants' perceptions and feelings about the study, their understanding of the critical thinking subskills, and the perception of usefulness of the application of the different instruments.

INTERVENTION

The pedagogical implementation planned for this study consisted of a series of six class activities for the development of critical thinking subskills. The activities were adapted from those proposed by Houston (2009) in his resource book for ESL/EFL teachers. In each of the activities participants were asked to focus on one critical thinking sub-skill. After each intervention, the teachers' notes were recorded in a research audio journal for further transcription, analysis, and coding.

Even though Houston presents a wide variety of sub-skills in his book *Provoking thought: Memory and thinking in ELT* (Houston, 2009), only three constitute the methodology of this study. The criteria to choose the subskills were those that the researcher found more likely accommodate to the context of language instruction in a beginners' EFL classroom; in other words, the ones that represented moderate challenge to learners. Thus, participants were exposed to the differentiation of facts and opinion, the identification of solid and weak arguments, and the appropriateness of decision-making. Another reason to select only three was the limited scope in the timeline implementation; the intervention described took only a couple months.

Houston's activities had to be accommodated to the audience in terms of number and topics; therefore, the original activities in his work were not completely suitable for

this audience. In order to provide the participants with a more familiar context and a fair level of challenge, the topics were adapted to the syllabus in this course. Therefore, the class did not exactly label random fact and opinion statements as proposed by Houston; instead, they labeled fact or opinion from a list of statements related to animals just to mention one of the activities. In sum, it can be said that the essence of Houston's work remained in the intervention in terms of tools and strategies to walk learners though the building of subskills. However, the original activities were adapted in order to suit the subjects' level of English and the course standards.

Table 1. Pedagogical intervention timeline

Activity	Objective / Sub-skill	Follow up action
Opinion Survey	Identify room for improvement in the test design	
Pilot entry test	Diagnose students' CT subskills	Refine aspects to improve in the test
Entry Test	Assess participants' thinking sub-skills	Use graphs to draw concus-sions and identify trends
Comparison mapping	Differentiate facts and opinion	Journal entry
Focus Group 1		
AND debates	Produce and identify solid and weak arguments	Journal entry
Lost in the ocean	Evaluate appropriateness of decision making	Journal entry
Endangered species	Differentiate facts and opinion	Journal entry
Mistreatment of ani-mals	Produce and identify solid and weak arguments	Journal entry
Focus Group 2		
Fables	Evaluate appropriates of decision making	Journal Entry
Exit test	Assess students' progress	Create comparative graphs for further analysis

DATA ANALYSIS AND INTERPRETATION

The data collected through the research instruments was the object of both qualitative and quantitative analysis.

Entry and exit tests. The graphs generated by the entry test served as instrument to identify group patterns and individual traits among the participants at an initial stage of the study. It was also fundamental to widen the scope of tools implemented as this constitutes qualitative material for analysis, all this to ensure validity. Later, a comparative exercise between the entry and exit texts analytics showed the degree of effectiveness of the implementation from a quantitative perspective.

Field notes and focus group. The analysis of the research journal was valuable to draw conclusions concerning the class's understanding and questions about each of the subskills observed. Following the manual coding techniques proposed by Saldaña (2015) such as color coding and labeling and the protocol described by Creswell (2015) concerning grouping and narrowing down of categories, it was possible to group participants' insights and questions into a set of categories that later served as instrument to refine further interventions.

RESULTS AND DISCUSSION

The data analysis and triangulation led to the distinction of three categories regarding the participants' command of critical thinking subskills: the level of difficulty, the level of relativism, and the perception of their usefulness.

LEVEL OF DIFFICULTY

During the intervention, participants struggled to effectively comply with some of the tasks proposed in the data collection instruments and pedagogical implementations. The reasons underlying this trait go from their perception of ambiguity to their inability to explain their choices. This difficulty led some participants to ineffective reasoning or inaccurate decision making evidenced in the data collected.

Participants' estimation of the level of difficulty of each instrument spoke to the underlying complexity of critical thinking. In order to complete each task, it was necessary to use a range of strategies, including conscious reading in order to not be deceived by ambiguous information or false facts, resorting to background knowledge to be able to judge within a limited context such as a sentence in some cases, retrieving their own experiences to match information with their values and experiences, and ultimately, choosing answers at random if none of these strategies worked.

Several participants reported that false facts in tasks increased difficulty in their decision making. An example of such is that in both the entry and the exit tests some participants struggled differentiating facts and opinions as shown in the following excerpt:

> *It may be that a fact, either true or false, can be considered as opinion; then, I think that it is still difficult for us when it (a statement) is not explicit if it's a fact or an opinion.*[1]

Nevertheless, participants could identify facts and opinions more accurately after the pedagogical application was performed. The exit test shows only a slight increase in participants' accuracy when differentiating these two aspects. The average result of the class went from 11,8/17 in the entry test, to 12,83/17 in the exit test.

Another aspect that increased some individuals' difficulty to judge accurately (e.g. decide whether statements are facts or opinions, distinguish solid from weak arguments, or judge the appropriateness or not of a course of action) was their perception of a lack of context and the need for this in order to complete tasks. The following except from the first focus group presents three participants who claimed that having a larger context in the given exercises would help them decide more easily:

> *I find it hard to differentiate whether it's fact or opinion especially when I haven't read about the topic or I don't know about that.*
>
> *Perhaps it was too short [the question] for me to tell things apart.*
>
> *It'd have been easier if there had been a paragraph as such.*

The level of difficulty in the different tasks was increased by a moral component, which caused participants to hesitate in their decision making. When asked about alternative uses from a list of items in a hypothetical shipwreck situation, participants made decisions based on moral standards rather than on practicality or appropriateness. The following excerpt illustrates such behavior.

> *It was funny how [Participant 9] and [Participant 7] decided not to keep the box of condoms even though other students mentioned several ways to use them such as containers, water proofing, and others. They were afraid of criticism and dumped the condoms because they are both men! (Researcher's journal "Lost in the Ocean")*

Difficulty also increased when participants were unable to indicate the reason why a given task was harder than others. The data collection instruments and the pedagogical intervention showed how some participants were inclined to think in one way or another based on gut feeling. Decisions were therefore made under a random criterion as illustrated in the following except from the second focus group:

[1] Excerpts translated from the original Spanish by the author.

I understand the situation and decide, that's right or not, or this is false or something like that, but I just don't know how to explain.

The difficulties reported do not mean failure whatsoever. On the contrary, the fact that participants were able to identify the factors that made the different tasks difficult shows an increasing gain in awareness and therefore in metacognition. Furthermore, the observation carried out and the test results evidences an acceptable level of accuracy in their decision making, with a mean of 13/17 in the entry and exit tests, representing that participants' perception of success is lower than their actual achievement. This study also found important advances during the pedagogical implementation as shown in the following excerpts

Participants have made advances in differentiating facts and opinions. They got more correct answers this time; besides, they no longer resort to others to decide on their answers. Their self-assessment of the activity was 8/10 on average, big progress considering that their last self-assessment was 6/10. However, some still believe that everything depends on several factors such as the circumstances, the people involved, or simply the one judging the given scenario… (Researcher's journal, Animal Facts)

Everyone seems to agree on identifying the right thing to do. It was surprisingly easy for them to decide whether the animals in the fable made a sensible decision or not and the reasons why. (Researcher's journal, fables discussion)

All in all, although their own perception highlights the flaws of their own process, they made actual progress.

LEVEL OF RELATIVISM

As part of the critical thinking sub-skills assessment proposed in this study, participants were asked to make decisions such as differentiating facts from opinions, judging the appropriateness of a given course of action, and evaluating the firmness of an argument. In these three domains, a certain degree of relativism in their reasoning was observed; as a result, their own decision making was a more complex process to some.

The level of relativism represents some participants' belief of the fact that more than one answer is correct, or in extreme cases, that any given answer is valid depending on several factors. The judged appropriateness or accuracy of ideas is therefore determined by aspects such as experience, educational background, moral standards, and cultural aspects. For example, participants identified personality traits as a key aspect to evaluate the appropriateness of an action, and strength of an argument. There is a generalized belief

among students that individual standards prime over collective conventions. The following excerpts present participants' views regarding personality and relativism.

> *Most things in life are facts, but some opinions also emerge from those facts. Those opinions depend on people's criteria. So, they can decide using their judgement whether something is a fact or an opinion.*

This excerpt exemplifies the flexibility given to decision making. This participant perceives facts and opinions as a relative construct. This perception frequently delays their decision making. Other participants also see adequacy as a personal trait as shown in the following excerpts:

> *It's hard to know whether it's appropriate or inappropriate. One doesn't know which to select. The exact same thing that may be appropriate for me, for somebody else might be like –that's wrong! It depends a lot on each person.*
>
> *Each person thinks differently, I may think that's appropriate or inappropriate and you may think the opposite!*

Personality traits are thus evidenced as a strong factor for participants' decision making during this study. Participants reported that each person may see things differently, therefore selecting one correct answer was not always easy.

A third aspect affecting the participants' decision making was family and cultural values. Many of them claimed that the way a person is raised and the environmental conditions may affect the validity, appropriateness, or feasibility of a given course of action. The following excerpts illustrate this trait.

> *It also depends on what you learned at home from your parents and all the values you received. For example, one of the questions asked us whether you'd get in the swimming pool wearing your undies if you didn't have a swimming suit. I thought well, that's normal, it's neither appropriate nor inappropriate.*

This quote also evidenced a lack of effective reading comprehension skills in Spanish. The original question states that this scenario is in a five-star hotel where the use of underwear in the public pool is often forbidden.

The cultural aspect also affected decision making. That is the case of a participant from another country who expresses his difficulties in decision making. He was not sure whether his answers accommodate to the Colombian context as illustrated in the following excerpt:

> *If I think about eating dog's meat, you think: that's so ugly! Right? Why are you eating puppies? We'd die before doing that! Eating dog is very healthy, just like eating chicken, the same. It's kind of like a cultural thing, I don't know. The situation changes from person to person. It's a different point of view.*

This participant points out the inappropriateness of eating dog meat in the Colombian context. He uses this example to present his concern towards relativism on decision making.

The generalized belief of relativism was evidenced along the study representing on the one hand, the possibility to consider other perspectives, but on the other hand it caused participants to hesitate in their decision making during the pedagogical implementation and test taking.

PERCEPTION OF USEFULNESS

This category emerged due to participants' interest in the applicability of the research process itself. Participants were asked to draw conclusions regarding the usefulness or not of the pedagogical implementation and of the testing process they had to undergo during this study. The data collected gives an account of a positive perception regarding critical thinking. Participants perceive a gain in thinking itself, their professional lives, politics, conflict resolution, and even self-awareness as presented in the following excerpt:

> *[Participant 5] approached me after the activity and apologized for not participating actively. She said she knew it was important for her to do it because she could not be silent when she thought differently; apparently, she felt intimidated by others with better level of English and opinionated students. (Researcher journal, Fables)*

This sample presents an important gain in this subject's self-awareness. Even though this study does not attempt to measure the factors interfering with class participation, here an emotional component suggests a relationship between the capability and affective domains.

Interestingly, the perception of usefulness of critical thinking skills goes beyond the academic environment. Many could use the techniques from this study in different contexts, evidencing what Bloom typified as application in his thinking theory (Anderson & Krathwohl, 2001). The following excerpts also illustrate the participants' views regarding application of critical thinking skills:

> *I believe this [the interventions] helps us develop what we learn in class which is critical thinking, I mean, the way some people think about something. Maybe we can say "this is a fact." We can't change it; if that's an opinion, of course we can change it, and things like that.*

This participant not only defines facts and opinions but also explains how opinions, unlike facts, may be changed. This represents important advances in the construction of argumentative skills and therefore in this participant's ability to handle discussions with a close understanding of these two concepts.

Another important highlight regarding the usefulness of critical thinking sub-skills is related to politics. This participant spontaneously points out how the framework presented in this study will eventually help her in her critical evaluation of a political speech.

> *Well… I may be straying away the topic when I talk about politics, but if something is happening you must be able to tell apart facts from opinions; I mean, if a politician is lying, you learn to differentiate.*

This excerpt also illustrates the participants' discoveries regarding the applicability of the skills gained during this study. Participants are able to extrapolate the in-class activities to their daily live practices such as voting, representing important gains in the construction of social beings, as described by Shaila and Trudell (2010). Participants perceived an improvement in their conflict resolution skills as well. The following excerpts present how the research instruments provoked thinking regarding relationships and conflict:

> *I think the appropriate and inappropriate quiz is mainly for conflict resolution… in the question she read, "If you add hot sauce in your food so that your brother doesn't eat it…" there are two ways to look at it. It would be appropriate because if you're mean and do that, your brother will get disgusted and he won't steal your food again; but on the other hand, it's inappropriate for you. Why? Because you jeopardize the food, you won't be able to eat it later; you're not solving the problem! In that case that'd be inappropriate.*

The exit test compelled students to think beyond the facts and evaluate the consequences of their courses of action. This participant evidenced the ability to think forward, being able to foresee upcoming events based on a given scenario. This statement evidences the existence of formal operation as the individual is able to think hypothetically (McLeod, 2009).

Along with the gain reported by participants, it is important to report their feelings towards the study and its implementation. When asked about their perceptions, some could not avoid pointing out the sense of aloofness provoked by being observed

It's like if we were guinea pigs, in the good sense of the word.

Nevertheless, the majority reported a sense of challenge and fulfillment when being tested.

> *The activity was absolutely engaging. Even those who could not find the words in English to defend their position, defended their choice using key words [Participant 8] would shout, "Opinion, no is real, no is real." (Researcher journal, Comparison mapping).*

Even though participants report experiencing several feelings during the study, this did not necessarily represent an obstacle to learning. On the contrary, the sense of challenge made them identify the worth in the whole process as presented in the following excerpt.

> *Well, I think that's good. Besides, one experiences many feelings, one feels intrigued. Sometimes one feels kind of like anguish; it feels like pleasure. Maybe it's this, maybe that… I felt like confused, even frustrated. When we did the DNA thing, we had to persuade the neutral person with our arguments. Then, one feels like… Shoot! What did I do wrong? One feels tons of frustration … I had fun in many ways, confused, listened, but I also felt good because I developed something new in my life so… that was good.*

These views clearly demonstrate how the experiences during the implementation of this study left a positive print in the participants' memories. Despite the distress caused by occasional frustration, they were able to perceive gains in their thinking skills. Interestingly, the level of amusement given to the pedagogical implementation, a class debate in this case, helped the learner feel challenged, heard, confused, but ultimately good because as she says, the will have learned a new skill in life.

CONCLUSIONS

Based on the data analysis and interpretation, the following findings are presented. Not all the participants evidenced command of critical thinking sub-skills in their mother tongue. Therefore, observing the development of these traits in English language depends on more factors beyond language, namely thinking and reasoning, among others. The factors affecting decision making often go beyond standard thinking processes such as inferring and implying. This study unveiled other criteria for decision making among participants. Thus, aspects such as self-esteem, various kinds of affiliations, moral standards, and educational background are counted as key variables among the study group.

Further, results of the pedagogical intervention indicate students exercising a more conscientious analysis of their decision making. The information collected in the focus groups evidenced a more careful analysis of the given scenarios before participants issued

their own claims. Participants reported significant gains in their own skills as learners and citizens. They reported that the learning obtained during this study was likely to aid their role as students and also as members of a larger group such as families and communities.

In conclusion, this study shows that some of the findings of the review of literature relate to the findings of the action research. The studies reviewed such as Shaila and Trudell (2010), Sanchez (2002), and Crandall (2000) refer to the possibility and the need for instructions in thinking skills. Similarly, in this study the pedagogical implementation demonstrated participants' increasing awareness and progress in thinking skills. Furthermore, the findings in this study adhere to the idea of the need for explicit instruction in order to progress into the upper stages of thinking (Elder, 2011).

Limiting the study to three thinking sub-skills represented important advantages and disadvantages. On the one hand, the study design allowed for the measurement of participants' performance and progress, increasing accuracy in the results. On the other hand, it prevented the researcher from seeing data from a wide-angle lens, reducing validity to some extent. Thus, further studies in this area are necessary to improve our understanding of the development of critical thinking among Colombian undergraduate students.

The processes of planning, implementation, and analysis of all the courses of action during this study unveiled several research possibilities for future studies. Besides, important limitations emerged along the way, limitations that represented the need of creative problem solving and that allowed the development of a more conscientious decision-making. It can be said that the study itself encouraged the researcher's thinking skills.

ACTION PLAN

This study represented both the opportunity to get to know students more deeply, and a challenge to become a more acute observer for the teacher-researcher. For further research, the following ideas emerged from the study:

- More research on the transfer of thinking skills from L1 to L2 is necessary. Even though this was not the focus of the present study, the results posit that question, whether thinking skills fully transfer from one language to another and if so, at what pace.
- A wider time frame for the study, two complete semesters perhaps, would be ideal to consider. The limitations conveyed by such a brief implementation (one month) made it difficult to observe significant advances from the quantitative evidence. Besides, a larger scope in time may account for participants' accommodation to the new academic environment, considering their age and their condition as first semester students, which assume challenges beyond just academics.

- Cooperation from colleagues to obtain results with wider validity in results is encouraged. This study measured results in a small group of students and in only one institution. Following the same research protocol in two different places with similar populations would increase not only the amount of information, but also the range of reliability in the analysis of data.

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APPENDIX A

ENTRY TEST

CRITICAL THINKING ABILITIES DIAGNOSIS TEST I

Fact or opinion

You will find a list of statements. Please, read each one of them carefully and decide according to your opinion whether it is a fact or opinion. Choose the best option.

The beaches in Providence island are peaceful and lonely.

From my view, "Koreans" have very weird habits.

Math classes are the hardest in the university.

That's the most expensive communications company.

The calculus professor is so strict. Last semester she flunked a lot of students.

She was murdered by her partner, She got stabbed 20 times.

Solutions evaluation

You will find a set of situations where you can see a possible solution of a problem. Please, read carefully each situation. According to your opinion, decide if the solution is APPROPRIATE OR INADEQUATE

There's a cat in the lamppost in front of my house. I decide to climb to save the nice kitten.

My classmate makes faces when I participate. I decided to talk to her to understand what is happening.

When visiting my uncle's house, I find out I forgot my toothbrush. I decide to use my cousin's.

My internet search engine freezes. I decide to turn off and on the PC.

I don't really like the music in the club. I talk to the DJ many times so that he plays other kinds of music.

I hate the music my neighbor plays, so I play my music louder.

I couldn't do my homework, so I do it in the bus on the way to school.

Strong and weak arguments

You will find a list of arguments facing different situations. Please, read carefully each one of the arguments and decide according to your opinion whether the argument is strong or weak.

I've never tried cigarettes or drugs, I take my health seriously.

Everyone should buy brand-made products. All products with a brand are good quality.

I wish I could buy a high-end model car. If I had one, everyone would respect me.

I don't fully trust my boyfriend because all men are the same.

I don't recommend a distance relationship. They represent a great risk.

I avoid meds because I may be allergic to their components.

APPENDIX B

EXIT TEST

CRITICAL THINKING ABILITIES DIAGNOSIS TEST II

Fact or opinion

You will find a list of statements. Please, read each one of them carefully and decide according to your opinion whether it is a fact or opinion. Choose the best option.

The alleys in Bogotá are crowded and noisy.

From my view, "gringos" have very weird habits.

The elective classes are the easiest in the University.

That's the cheapest mobile phone.

She is the best student. She always does what the teacher assigns.

His parents abandoned him in a basket on the 19th avenue.

Solutions evaluation

You will find a set of situations where you can see a possible solution of a problem. Please, read carefully each situation. According to your opinion, decide if the solution is APPROPRIATE OR INADEQUATE

There's a spider in my house. I pick it up and throw it out the window.

Lately, the watchman takes a long time to open the door for me and is not kind. I ask him if he is mad at me or if I did something to upset him.

Being on holidays in a five-star hotel I forget to take my bathing suit, so I decide to wear my underwear instead.

My cellphone is blocked, and none of the buttons work. I take the battery out and then I put it in again.

I don't like the TV channel that is tuned in the restaurant, so I take my laptop and I watch movies instead.

I hate that my brother eats my food, so I pour some spices and I wait for him to eat so he learns not to eat my food.

Strong and weak arguments

You will find a list of arguments facing different situations. Please, read carefully each one of the arguments and decide according to your opinion whether the argument is strong or weak.

I avoid alcohol because in my family there have been previous cases of alcoholism.

All the teachers should dress better, so the idea that teachers are poor would change.

It is demonstrated that people that dress well are highly respected by others.

I won't ever have a girlfriend from that part of the country. All the women from there are flirtatious and unfaithful.

I don't suggest sleeping in Transmilenio because it is very risky.

I avoid eating fast foods because I have irritable bowel syndrome and gastritis.

CHAPTER 7

USING INTERACTIVE PROGRAMMING ENVIRONMENTS FOR THE ACQUISITION OF COMPUTATIONAL THINKING SKILLS IN HIGH SCHOOL STUDENTS

MERCEDES CAROLINA FERRER RONDON

Digital literacy is a widely used term in Colombia today, but there are actually few documented experiences of the power of programming to develop a wide range of thinking skills in students. At the St. George's School in Bogotá, Mercedes Ferrer participated in a project to develop computational thinking skills in students. Her work using interactive programming environments is an innovative approach to help students develop digital literacy, creativity, and higher order thinking skills to solve problems.

ABSTRACT

Computational thinking is the ability to solve problems using a computer, including skills such as abstraction, analysis, critical thinking, creativity, and teamwork. This research inquired as to the possibility of developing computational thinking skills in high school students through the use of an interactive programming environment that allowed for problems to be solved by simulating the solution. This qualitative study was implemented at the Saint George's School in Bogotá. Data collection techniques included observations, tests, and questionnaires. Results demonstrate that with the implementation of the tool *Karel the Dog* as the interactive programming environment, computational thinking skills were developed in high school students, and the motivation for problem solving increased.

Key words: Computational thinking, Problem solving, Abstraction, Computer science, Critical thinking, Computer programming, Simulation

RESUMEN

El pensamiento computacional es la capacidad de resolver problemas usando una computadora, incluyendo habilidades tales como la abstracción, el análisis, el pensamiento crítico, la creatividad y el trabajo en equipo. Esta investigación indaga acerca de la posibilidad de desarrollar habilidades de pensamiento computacional en estudiantes de secundaria, mediante el uso de un entorno de programación interactiva que permite resolver los problemas simulando la solución. Este estudio cualitativo fue implementado en el colegio San Jorge de Inglaterra en Bogotá. Las técnicas de recolección de datos incluyeron observaciones, pruebas y cuestionarios. Los resultados demuestran que con la implementación de la herramienta *Karel the Dog* como el entorno interactivo de programación, se desarrollaron habilidades de pensamiento computacional en los estudiantes de secundaria, y aumentó la motivación para la resolución de problemas.

Palabras clave: Pensamiento computacional, Resolución de problemas, Abstracción, Informática, Pensamiento crítico, Programación informática, Simulación

Computational thinking helps individuals to systematically develop critical thinking and problem solving based on the concepts of computer science and using the power of calculation of computers. One of the main components of computational thinking is critical thinking, which is defined as the ability to think about any topic, problem or situation. Additionally, computational thinking is formed by the different concepts of computing, to which abstraction is central. It is based on problem solving, along with critical thinking applied to technology, and applies the main concepts of computer science, including abstraction, algorithm, programming, and simulation.

Research indicates that students, especially high school students, can benefit from the use of interactive programming environments or video game design in the process of acquiring computational thinking skills. Since technology is now part of everyone's lives, this has been the tendency, and it has been proven that students can be more motivated with the use of these tools when they are learning computer science concepts. Moreover, studies have shown that students can learn how to solve problems applying technological tools that can help them to simulate the solution. Further, relating these problems with their real lives makes the process more meaningful.

At Saint George's School in Bogotá, the Information and Technology Department implemented a new curriculum in 2015 in all grades (from kindergarten to eleventh grade). Its main objective was to help students to acquire more skills in the area of computational thinking, which would also help them be prepared for the requirements of university.

As such, the purpose of this research was to find out how high school students could develop computational thinking skills through the application of strategies to specific problem solving tasks. Additionally, students used an interactive programming environment called *Karel the Dog* in order to solve problems. Results indicate that computational thinking skills can be developed more effectively through the use of an interactive programming environment than applying typical word problems since students are more engaged with technology and they can learn by playing.

LITERATURE REVIEW

GAME DESIGN

Research has found that creating virtual games can help students develop computational thinking skills, specifically abstraction, logic, and algorithmic thinking to solve problems. Additionally, it has been demonstrated that both computational thinking and creativity can be measured through game design, using different environments like Scratch, Alice, Logo, and others.

Repenning, Webb, and Ioannidou (2010) explored new strategies in order to extend and integrate the program given in extracurricular classes with K-12 students related to

game design. Student motivation in these schools towards the computer science curriculum was low, but there was a huge demand for the game design taught in the extracurricular classes. As part of the project, the researchers created a checklist, which they tested with thousands of students. This checklist included some programs for game design, as well as teacher training modules that could be implemented with middle school students. Findings demonstrate that through game design students can actually learn how to program using environments like Scratch, Agent Sheets, and Collaborative Diffusion. Conclusions suggest that these programs can be included in the regular curricula and can enhance K-12 computer science education.

Similarly, Settle, et al. (2012) describe the modification of a curriculum applying an assessment in order to write a story which previously was written on paper or a word processor. Students were asked to write an interactive story representing it as a game using the program Logo. It is important to clarify that students using Logo were programming using blocks instead of using the syntax of the programming language. Findings showed that students were able to learn programming skills in a friendlier environment applying game design.

Bennett, Han Koh, & Repenning (2013) summarize a case study of a teacher who developed a formula in order to calculate and evaluate students' creativity through game design. The process of game design provides three main variations that can help teachers to measure creativity in students: character, level, and behavior. Researchers reported that creativity can be assessed by analyzing those variations by a simple visual inspection of the game design production of each student, and this was considered as a valid measurement of creativity using students' game design.

Other studies observed game design processes by students in order to identify computational thinking patterns (Basawapatna, Han Koh, Repenning, Webb & Sekeres, 2011). The evaluation involved extracting context from a real life phenomena video which was simulated in a game programming software. Later, students were asked to find patterns from their game programming. For instance, participants found the missing parts of a game in the program. The study demonstrated that all participants were able to abstract computational thinking patterns taking into account different environments and contexts.

Another study measured students' computational thinking and related concepts including abstraction, modeling, scale, algorithmic thinking, and simulation in order to solve problems (Werner, Denner, & Campe, 2011). Students were asked to create an interactive game about a story written in the program Alice, which is a programming environment that allows the creation of games through coding. The investigation showed that in fact, using the program Alice as an assessment in order to evaluate different concepts related to computational thinking provided information as to whether the student can apply those concepts or not. Further, Campe and Kawamoto (2012) describe the same concept of creating a video game in Alice in order to measure the different concepts of computational thinking. Holbert and Wilensky (2011) also explain how video game design can be the key in order to engage students with computational thinking

PROGRAMMING ENVIRONMENTS

Concepts related to computational thinking can also be accomplished using some programming environments like Net logo, Scratch, App Inventor, and Alice. These environments have been shown to help students solve problems, and offer solutions with simulations. They have also been shown to be effective tools in order to integrate computational thinking in schools without the use of complex programming languages.

Morelli, et al. (2010) focused their research on the program App Inventor, which is a new visual programming tool for creating mobile applications. It proved to be a powerful tool in order to introduce computational thinking among introductory level courses at college and K-12 students (Morelli, et al., 2010). The project was carried out during summer camp by a team of computer science teachers, undergraduate computer students, and college computer science teachers. This event was mainly created in order to promote computational thinking by using the tool to create complex mobile apps that were done by their own creativity. Findings suggest that the tool can allow students to develop skills in object oriented programming.

Other studies demonstrated the implementation of interactive programming tools like Netlogo (Blikstein, 2010), and Scratch (Grover & Pea, 2013) as media to acquire skills related to computational thinking, including conditional thinking, iterative and parallel thinking, and abstraction.

PROBLEM SOLVING

Research has also focused on the use of computers, virtual environments, and computational thinking to help students solve real life problems. One study about an intensive robotics course was done with middle school students in order to increase systems understanding (Sullivan, 2007). The participants of this robotic summer camp were tested with a pre- and post-test related to a robotics challenge. Findings indicated that after participation in the course, and being put in a context in which they had to solve robotic challenges, students increased their systems understanding. It also allowed students to apply thinking skills and science processes related to computational thinking, problem solving, and critical thinking.

Another study demonstrated the use of computers as a tool to solve problems. The research was done with a higher mathematics class in which the students were divided into two groups: one with the use of computers and one without (Voskoglou & Buckley, 2012). The findings showed that after the evaluation, the group who used the computers as the tool to solve problems were able to enhance their abilities to solve real life mathematical problems. In the same order, another investigation showed the valuable use of a computer in a classroom in order to solve problems using Alice as an assessment (Werner, Denner, &

Campe, 2012). They reported that the use of Alice can help develop and evaluate students' understanding and the use of abstraction, conditional logic algorithmic thinking, as well as other computational thinking concepts to solve problems.

TEACHERS' ROLE IN IMPLEMENTING COMPUTATIONAL THINKING

Mannila, et al. (2014) demonstrated the relationship between teachers and computational thinking in order to prove whether teachers are ready to implement a CT curriculum in their schools. This research was performed taking into account the participation of K-9 teachers who completed a survey in order to evaluate computational thinking in classroom practice and to understand whether or not they are ready to apply computational thinking in their classrooms. Through the analysis of the data collected, the findings showed that many teachers in different countries were already applying computational thinking concepts in their classes.

One study demonstrated that students who attended a module on computational thinking improved their knowledge and understanding of computational thinking, and their motivation towards the topic also increased. This project was done with K-12 teachers who attended a one-week computational thinking module with the intention to measure participants' attitudes towards computing (Yadav, Zhou, Mayfield, Hambrusch, & Korb, 2011). Students who attended the computational thinking module were more committed and aware of the concepts of computational thinking.

METHODOLOGY

CONTEXT

This research took place at Saint George's School, a co-ed private English immersion school located in Suba-Bogota, Colombia. It offers school grades from preschool through 11th grade.

Computational thinking project at St. George's School. For four years prior to the research, St. George's School had focused its curriculum on computational thinking following the standards of the Cambridge curriculum for all grades. The decision for the change in the curriculum took place after a benchmarking study in 2014 with schools and universities in Colombia, USA, Costa Rica, England, and other countries. After the investigation and analysis of the program, the team found a weakness in the area of computational thinking, which is a necessary skill in this century. Additionally, as a Cambridge school, some aspects were required that were not considered previously in the old curriculum. Taking that into account, the school decided to change the program in 2015.

For the creation of this program the school took into account the following standards: National Ministry of Education (MEN), National Ministry of Information and Communication Technology (MINTIC), Cambridge University Press, International Society for Technology in Education (ISTE), Costa Rican Standards, and Computer Science Teachers Association (CSTA). After the analysis of each standard, and the actual situation about technology in the world, the school proposed to offer an integrated program based on computational thinking since that is the global tendency. This program was named *Currículo Innovatic*. It is a new curriculum for computer and technology classes which includes IT fundamentals, computational thinking, ICT in the different sectors of society, and ownership and use of ICT. Its main purpose was to develop students' higher order thinking skills required nowadays at universities and in other fields through computational thinking. The project was proposed for a period of three years, with a two-year transition period to build some required skills. The objective of this new curriculum was to prepare students for the Cambridge IGCSE computer science certification program. The program includes 4 main topics:

- **IT fundamentals:** related to the concepts of computer science
- **Computational thinking:** to help students develop problem solving skills and critical thinking using a computer
- **IT in the different sectors of society:** the impact that technology is having nowadays in our society
- **Ownership and use of ICT:** the use of technological tools.

The department divided the entire school in groups according to the level, skills, and needs of the students. In addition to the transition period to develop students' basic skills, teachers who belong to the Information and Technology Department received training since the beginning of 2015 with the purpose of being prepared for teaching the new information, especially in the area of computational thinking.

PARTICIPANTS

Participants in this study were 167 students in ninth and tenth grade who were approximately 15 to 17 years old. The participants were bilingual, and they had some knowledge about some programming structures, and programming languages. Participants also included the teacher-researcher, who was the students' teacher, who led the workshops on computational thinking.

DATA COLLECTION INSTRUMENTS

In order to measure and collect information to answer the research questions, three qualitative techniques were applied: test, observation, and interview.

Pre-questionnaire. A closed-question survey was applied to all the students involved in the project in order to establish the level of acceptance of the topic computational thinking. Respondents selected degrees of agreement with statements related to all the topics presented during the implementation of the project.

Test. According to Cohen et al. (2007), criterion-referenced tests "provide the researcher with information about what the students can do" (p. 416), and among these Cohen et al. (2007) highlight domain-referenced tests since they "provide the possibility to assess the students domain level and permit to set sample procedures which become the representation of the wider field" (p. 416). For the present study, two tests were applied. In the first test, students analyzed and solved a problem applying some computational thinking strategies that were discussed in class. This test was evaluated by the teacher and by the students using a model which they had to follow and a rubric for self-evaluation. Additionally, another test was applied using the online programming environment *Karel the Dog,* which provided the evaluation and the statistics of each student through the entire evaluation process.

Observation. Cohen et al. (2007) affirm that observation "offers an investigator the opportunity to gather 'live' data from naturally occurring social situations. The researcher can look directly at what is taking place in situ, has the potential to yield more valid and authentic data, and enables a researcher to look afresh at everyday behavior" (p. 396). For this research, class observation was carried out in order to register with pictures and videos their performance during the execution of the different activities that took place during the classes regarding the topic of computational thinking. The students were not filmed or photographed, rather the teacher-researcher took notes while observing their activities and analyzed their work after class.

Post-questionnaire. In accordance with Wilson and McLean (as cited in Cohen et al., 2007), the questionnaire is a widely used and useful instrument for collecting survey information, providing structured, often numerical data, being able to be administered without the presence of the researcher, and often being comparatively straightforward to analyze (p. 336). A semi-structured questionnaire in English with closed and open questions was applied with high school students at the end of the intervention. The questions that were included had described their opinion on tasks, how they perceived their interaction and motivation towards computational thinking, how they felt when solving tasks, and what tasks they liked the most. The main purpose of this questionnaire was to know how the intervention affected students' abilities and skills towards computational thinking in the classroom.

DATA ANALYSIS AND INTERPRETATION

In order to analyze the data gathered after applying the different instruments, the interpretation of data was made with content analysis. Codification was the first step to identify some categories as evidence of critical thinking. The majority of categories were repetitive in the proposed instruments. The common categories identified were *analysis, problem solving, theoretical concepts related to computational thinking, abstraction* and *simulation*.

Classroom observation. Each classroom observation was done with the students involved in the process in order to register with pictures and videos their performance during the execution of the different activities that took place during the classes regarding the topic of computational thinking. This was not a measurement, but rather taken into account only for the analysis of the tests and questionnaires.

Test. With high school students from ninth and tenth grade, two tests were applied in order to measure the computational thinking skills. One of them was done with word problems, and the other was done using the interactive programming environment *Karel the Dog*. For both, categories were established in order to track students' performance with the following categories**:** Basic, Low, Good and Excellent (See Appendix C).

Questionnaires. The questionnaires were applied in the classroom, online and it was tabulated based on students' answers. The results were analyzed based on the results, rubrics, evaluations. Based on the results conclusions were established.

RESULTS AND DISCUSSION

Results of previous studies have shown that students can acquire and develop more computational thinking skills with the use of an interactive programming environment rather than with the use of word problems. Students often do not feel motivated if they have to analyze a problem that is related to math or similar to the ones they solve in math because they think it is going to be difficult. In this research, it was demonstrated that students can feel motivated to analyze problems and find the solution if the problem is presented through an interactive programming environment, in this case *Karel the Dog*.

INSTRUCTION AND EVALUATION OF THE CONCEPT OF COMPUTATIONAL THINKING

The topic of computational thinking was introduced to ninth and tenth grade students, and a baseline evaluation was carried out of their pre-existing knowledge of the topic. Students were asked about their previous knowledge about the topic, and about the term computational thinking. Students were asked to define the term in their own words.

Based on this baseline evaluation, it was found that students were not familiar with the term or the meaning of computational thinking.

After that, a formal introduction began with a video created by the teacher in order to show the concept of computational thinking, and the related skills and abilities. After this first class watching the video and discussing its content, students were able to summarize the information given, and also explain in their own words the meaning of computational thinking. This evaluation consisted of four questions related to computational thinking in order to measure their understanding about this process.

Results indicate that the great majority of students were able to explain the concept of computational thinking in their own words, as well as the concept of a heuristic strategy. Additionally, students were able to demonstrate that they could analyze the information to become familiar with the concept of computational thinking, and could describe the terms and apply them in different contexts.

INSTRUCTION AND EVALUATION OF HEURISTIC STRATEGIES

After the introduction to computational thinking, students were introduced to the idea of heuristic strategies. Heuristic strategies are used in order to solve any type of problem. They consist of following four stages: understanding the problem, drawing a plan, executing the plan, and checking and analyzing the results. These heuristic strategies help students with the process of abstraction and decomposition, which are important skills related to computational thinking. The term was new for students even though the content itself was related to what they already knew and used in math to solve problems.

After the discussion and presentation of the heuristic strategies, students were asked to solve a problem applying the strategies, related to computational thinking and also related to their lives. The problem was about the *Plaza de Bolivar*, which is the main square in downtown Bogotá, a place that is familiar to them. They had to calculate how many people could fit in the *Plaza de Bolivar* standing up. This problem was solved with the whole class and discussed so that they would be able to apply the heuristic strategies independently. After the discussion, a model of the solution was shown to the students (Appendix A).

After discussing the solution to this model problem, students were asked to solve two problems applying the same strategies. The second and third problems were chosen considering their knowledge in math. The problems were easy enough so that the students could arrive at the answer without applying the heuristic strategies; nevertheless, they were required to apply them. It was difficult for the students to follow the process since they wanted to have the results immediately. After a while, students were able to analyze the problems, and follow the heuristic strategies, which are essential in order to implement computational thinking.

Students were then asked to complete one of the activities as a practice, with no formal evaluation, and then another activity was evaluated by the teacher using a rubric, and also by the students using the same rubric for self-evaluation rubric (Appendix B). In the first problem, students had to calculate if Esteban had enough money to buy a skateboard. In the second problem, they had to calculate the total score a player had gotten in a poker game. For these problems, students were asked to apply the heuristic strategies:

- Understand the problem: Organize the information given, find the unknown, find restrictions, and refine the results to be achieved.
- Draw a plan: Plan how to find the solution of a problem without any calculation.
- Execute the plan: Find the solution of the problem following the plan.
- Check and analyze the solution, taking into account the plan, the restrictions, the expected results and the operations.

The teacher's evaluation was carried out using a rubric that focused on the heuristic strategy stages for problem solving. The criteria used was based on a basic rating scale rubric in which each stage was described with the different goals that students were expected to achieve. This rubric was used in order to evaluate students following a unique pattern in a problem that was designed for applying the heuristic strategy.

Based on the rubric designed for the evaluation process, the teacher checked the production of each student in ninth and tenth grade. Using the rubric, almost all students accomplished the goal. The results could be expected taking into account the classes the students have had and the practice exercises problems they solved in order to acquire the level expected using the four-stage heuristic strategies. The conclusion is that most students were able to analyze a problem, understand the data given, eliminate useless data, design a plan, execute the plan, and finally check and analyze the solution.

The student self-evaluation rubric was the same as that used by the teacher. Its purpose was to have a validation of the teacher's evaluation. The objective of this rubric was for students to evaluate themselves using a set of criteria, and also to see if they were able to reflect on what they had done so far, not only in the evaluation but also in the different classes they had received on the strategies. Results using this rubric are similar to the teacher's results. Students were able to show the ability of self-evaluation and were able to analyze their behavior towards the topic. Comparing the charts of the computational thinking evaluation and the computational thinking rubric, it can be concluded that the range of students between excellent and good is similar. Some students were commenting that they were able to do everything but they were confused during the exam.

APPLICATION OF COMPUTATIONAL THINKING

Next, the software *Karel the Dog* was introduced to students as a tool for problem solving. *Karel the Dog* is an interactive programming environment in which students are asked to solve different challenges that increase in difficulty. It consists of a dog that acts as a robot that can receive instructions provided by the user in order to solve a challenge. These instructions are written using the programming language Java without the need of users actually learning the syntax. The application allows users to develop computational thinking skills applying basic concepts such as abstraction, analysis, problem solving and simulation.

Students worked with the program for four classes of 45 minutes each. During the first class, students were introduced to the program and were able to create their accounts. After that, students watched a video in order to familiarize themselves with the environment. Then, for the second class, the activity was presented in a way that all students could follow the instructions.

The application was chosen in order to provide students with a tool to approach problems in which they would analyze, collect data, abstract the information, design an algorithm or a pattern as part of the solution, and perform a simulation that could show the process and reality of the design. Additionally, *Karel the Dog* offers real time analysis to see and understand if the sequence has a mistake so that students can debug and improve the process.

Introduction and evaluation of the program Karel the Dog. *Karel the Dog* was introduced to students from ninth and tenth grade. Students were shown how to solve different situations represented in a picture, and the space was provided by the application in order to write the algorithm that would solve the problem. The algorithm was written using Java. This was the first approach students had with the programming language.

Computational thinking using the program was evaluated based on the number of levels students could complete, including videos, quizzes and challenges for each level. In this research, students were asked to complete up to Level 6, which included the basic functions in this interactive programming environment. The activity was introduced by the teacher who explained the objective, expectation and levels to be archived by the students in a specific period of time. Students had two classes of 45 minutes each in order to complete the activity. Additionally, there was a third class in order to discuss and summarize the process they were following using the program.

The problems that students were asked to solve using the application consisted of analyzing an initial situation in which a picture was shown with the expected solution. Then, students were asked to analyze the picture creating an algorithm using a specific language that could give instructions to the dog in order to arrive at the initial picture. Also, students were asked to use a specific syntax to write the algorithm. After that, students were asked to test the algorithms and observed the result to see if they were writing the code correctly. If

the program showed a mistake, students were asked to solve those errors and improve the process.

Some of the students were able to finish the activity in the time that was established. Even though the program and the language were new for them, students were able to apply their previous knowledge related to problem solving strategies including the heuristic and the algorithmic strategy allowing them to analyze the situation before trying to solve them. As a result they were able to deduce the solution of the problem. On the other hand, those students who were not able to complete the activity those who were trying to solve the challenges without the analysis and the corresponding execution. Indeed, the same students had difficulties trying to apply the heuristic strategy and tried to find a solution and the answer without the previous process. In addition, it was possible to observe the difference between the problem solving process using math problems and the one using the interactive programming environment. Students were engaged, challenged, and tried hard to pass all the levels.

Computational thinking survey. After working with *Karel the Dog,* ninth and tenth graders completed a survey to indicate their level of acceptance regarding the computational thinking program. The survey showed that all students were more connected with the program *Karel the Dog* in order to work with the computational thinking program. They expressed that they agreed with the fact that *Karel the Dog* can help develop computational thinking skills such as problem solving, analysis, abstraction, algorithm, and simulation. Also, they enjoy solving problems in an interactive programming environment in which they can receive feedback immediately, and that with *Karel the Dog,* they can apply the concept of computational thinking. On the other hand, students said that they did not like to solve word problems in the computer science class since they relate this with the math class in which they tend to lose interest.

After the intervention, it was observed that students were more likely to work with an interactive programming environment rather than trying to solve word problems in which they had to apply different strategies of problem solving including the heuristic strategy. During class observation, the teacher could notice that students were more engaged with the program *Karel the Dog* than solving math problems. In the first part of the program, students were asked to solve word problems similar to the ones they solve in math, but they expressed some rejection to them, arguing that computer science is not math. However, with *Karel the Dog*, even though students were required to analyze and apply the heuristic as well as algorithm strategy in order to solve the problems, they were not thinking about math, or problem solving. In fact, they felt that each level was a challenge to accomplish in order to win. They were playing and at the same time learning the structure of the problem solving strategy applying computational thinking skills including analysis, abstraction, and simulation. Simulation is one of the most interesting things during the problem solving process because students can actually see and understand what they are doing. Moreover, in the survey, students said that they loved the immediate feedback and guidance about where the mistake was without thinking about a grade. Instead, they were only thinking about how to achieve the objective of each level in order to move on to the next.

CONCLUSIONS

This study sought to identify the evolution and acquisition of computational thinking skills in high school students with the different instructional strategies that the computer science teacher employed, as well as students' beliefs about the role of computational thinking in their lives. Based on the findings, it was possible to draw a number of conclusions. It was found that students from ninth and tenth grade at Saint George's School were able to show understanding of the concepts of computational thinking, as well as the development of some computational thinking skills that were promoted with the implementation of specific tasks, first related to word problems in which the students needed to analyze and find the solution through the application of the heuristic strategy. Additionally, students were asked to do the same analysis implementing the interactive programming environment *Karel the Dog*. This environment was successfully used by the students in order to solve problems applying the computational thinking skills needed in this project.

Indeed, students were more engaged with the problem solving process applying the interactive programming environment *Karel the Dog*. They indicated that with the program they were able to learn by playing. Taking this into account, and in accordance to what Repenning, et al., (2010) explored, it was found that students were more motivated to find the solution of a problem in an environment that was not related to math and in which they could simulate and see the solution.

Moreover, this research promoted the application of technological tools for problem solving process, changing the way students can be assessed, Similarly, Settle, et al. (2012) describe the modification of a curriculum applying an assessment in order to write a story which previously was written on paper or a word processor. Students were asked to write an interactive story representing it as a game using the program Logo. It is important to clarify that students using Logo were programming using blocks instead of using the syntax of the programming language. Findings show that students were able to learn programming skills in a friendlier environment applying game design.

Similarly to this research, other studies have demonstrated the implementation of interactive programming tools like Netlogo (Blikstein, 2010), and Scratch (Grover, & Pea, 2013) as media to acquire skills related to computational thinking, including conditional thinking, iterative and parallel thinking, and abstraction. These concepts are similar to those developed and observed using the application *Karel the Dog* to develop specific computational thinking skills.

In terms of limitations of this study, since the data analysis was based only on the interaction of the students with the application *Karel the Dog* and the computational thinking skills that this application develops, it was not possible to observe the learning process related to a real programming language and the execution of the structure of the syntax applied in a real case. It was also not possible to evaluate the level of computational thinking acquired in a programming language by these students at the moment the research was held.

This research showed a different perspective of computational thinking development in high school students and opens the opportunity of researching different aspects, but especially in terms of diagnostic tools to determine the level of computational thinking skills in students from high school. Other aspects that can be suggested for future research projects relate to students' perceptions and behaviors towards the problem solving process using a real programming language, and the learning process that they can follow starting with an interactive programming environment and ending with a high level programming language. This would complement the study of computational thinking development in high school students, which is a field that can become a tendency nowadays.

ACTION PLAN

The proposed plan of action based on this study for the Saint George's School and specifically for the computer science high school program include the following:

- Training sessions for teachers on the development of computational and critical thinking skills.
- Study and implementation of new classroom methodologies that promote the development of problem solving through the use of interactive programming environment and game-based learning.
- Renovation of class materials, resources and technological tools to aid in the development of computational thinking.
- Inclusion of computational thinking indicators (analysis, abstraction, simulation, problem solving) into the Understanding by Design lesson planner recently adopted by the school.

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APPENDIX A

PLAZA DE BOLIVAR PROBLEM

Plaza de Bolivar Problem
How do I calculate how many people might fit in the "Plaza de Bolivar" if they are standing up?

- **First: Understand the problem.**
  - Read the problem repeatedly
  - Set data problem

The IDRD requires to know how many people can fit standing up in the Plaza de Bolivar to host an event. They know the dimensions of the square and the dimensions of a person.

  - Available Data:

The dimensions of the plaza (length x width).
Average dimensions (length x width) of a person.
Drawing.

  - Refine the result to be achieved

An integer representing the amount of people who can fit standing up in the Plaza de Bolivar.

  - Identify restrictions

The units for measuring the dimensions are in meters.

- **Second: Draw a plan**

Identify sub-problems:
1. Enter the dimensions of the square and the dimensions of an average person
2. Calculate the area of the Plaza
3. Calculate the average area occupied by a person
4. Divide the area of the square occupied by a person

- **Third: Implement the plan (resolve)**

Length of the square: 140 m, and wide 100 m
A person: height: 0.5 m, and wide: 0.5 m
the area of the plaza = 14,000 m2
The area of a person = 0.25 m2
#personas = 14,000 / 0.25 = 56,000

- **Fourth: Check and Analyze the solution: Check if the solution is appropriate.**

Result: The number of persons that can be accommodated in the Plaza de Bolivar is: 56,000.
The second and third problems were chosen taking into account their knowledge in math. The problems were easy enough so that the students could get the answer without applying the heuristic strategy, but it was required to apply it. It was hard for the students to follow the process since they wanted to have the results immediately. After a while, students could be able to analyze the problems, and follow the heuristic strategy.

APPENDIX B

HEURISTIC STRATEGY RUBRIC

ITEM ASSESSED	86-100 POINTS	73-85 POINTS	60-72 POINTS	40-59 POINT	10-39 POINTS
First: Understand the problem	I read a problem and I can analyze the information given establishing the relevant information following the heuristic strategy. I can set the data problem, clarify the question, and find the unknown, refine the results to be achieved, organize the information, consider restrictions, and draw a picture or a diagram representing the problem.	I read a problem and I can analyze the information given establishing the relevant information following the heuristic strategy. I can set the data problem, clarify the question, and find the unknown, refine the results to be achieved.	I read a problem and I can analyze the information given establishing the relevant information following the heuristic strategy. I can clarify the question, and find the unknown.	I read a problem and I can analyze the information given establishing the relevant information following the heuristic strategy. I can organize the information but is hard for me to find and refine the results to be achieved.	I do not understand the heuristic strategy for problem solving. I can read a problem and offer the solution right away.
Second: draw a plan	I can read a problem and eliminate useless data. I recognize and classify the structure of the problem. I can consider one or more strategies to plan, choose and decide the operations that I will execute in order to find the solution of a problem.	I can read a problem and eliminate useless data. I recognize and classify the structure of the problem. I can choose and decide the operations that I will execute in order to find the solution of a problem.	I can read a problem and eliminate useless data. I recognize and classify the structure of the problem. I can think about the operations that I need to apply but I cannot describe them and set plan.	I recognize and classify the structure of the problem. I can think about the operations that I need to apply but I cannot describe them and set plan.	I cannot design a plan in order to solve a problem.
Third: implement the plan	I generate a solution to a problem by implementing and executing a plan following several processes or steps in order to solve an equation formulated by me including all the operations planned.	I generate a solution to a problem by implementing and executing a plan following several processes or steps in order to solve an equation.	I generate a solution to a problem by implementing and executing a plan following several processes.	I can be able to get a solution for a problem without executing a plan or following some processes or steps.	I am not able to implement a plan in order to solve a problem.
Fourth: Check and analyze the solution.	I analyze the result from a wide range of perspectives applying background knowledge. I evaluate the resulting options and reflect on the solutions in order to make adjustments if it is required. Based on the information provided and the previous analysis I am able to recognize if the solution is accurate and fulfill the question.	I analyze the result from a wide range of perspectives. I evaluate the resulting options and reflect on the solutions in order to make adjustments if it is required. Based on the information provided and the previous analysis I am able to recognize if the solution is accurate.	I analyze the result from a wide range of perspectives. I evaluate the resulting options and reflect on the solutions in order to make adjustments if it is required.	I evaluate the resulting options and reflect on the solutions in order to make adjustments if it is required.	I can see the solution of a problem but I am not able to analyze and check if the answer is correct.

APPENDIX C

KAREL THE DOG

In order to get familiar with a programming language, we will practice a syntax in an interactive programming environment called *Karel the Dog*, which is going to allow you to find the solution of a problem and simulate it.

Note: This activity must be done individually.

Please complete the following stages.

1. Lesson 1: Introduction.
2. Lesson 2: More basic Karel.
3. Lesson 3: Karel can´t turn right.
4. Lesson 4: Function in Karel.
5. Lesson 5: The start function.
6. Lesson 6: Top down design.

For all of them:

1. Watch the video.
2. Take the quiz.
3. Analyze the example.
4. Complete the activities.

The evaluation:

This activity is going to be evaluated according to your performance which is going to be analyzed by the teacher taking into account the information provided by the page *Karel the Dog*.

CHAPTER 8

METACOGNITIVE TRAINING AND ITS INFLUENCE ON ENGLISH LANGUAGE TEACHERS' AWARENESS AND CLASSROOM PRACTICES

TANIA ISABEL IBÁÑEZ CARRASCAL

At the Centro Colombo Americano, Bogotá, language learning strategies, autonomy, learner training, and metacognition have long been staples of its English language programs, based on an institutional philosophy of language learning as a universal ability and possibility. Many English language institutes offer classes to a wide range of students in Colombia, but not everyone is successful at reaching their learning goals. The Colombo pays special attention to helping its students learn how to learn, and learning strategies are a large part of that philosophy of empowerment. Teachers at the Colombo are asked to explicitly share metacognitive strategies with their classes, but it was unclear to Tania Ibañez, teacher in the Kids and Teens Program, where teachers were getting their metacognitive knowledge. She decided to survey teachers in the program and probe to the roots of their knowledge and expertise on the topic.

ABSTRACT

This study explored how a group of English teachers in the Kids and Teens Program (KTP) at the *Centro Colombo Americano* in Bogotá have been trained in the use of metacognitive skills and strategies. Metacognition is an important part of the KTP, where teachers train young learners explicitly on language learning strategies. The study inquired into teachers' metacognitive understanding and knowledge, as well as the sources of that knowledge, and further, how this may transfer to their teaching practices. Questionnaires and interviews served to explore teachers' perceptions towards and understanding of metacognition, as well as any instruction they might have received on the topic. Documentary analysis of the undergraduate language teaching programs these teachers attended also examined the existence of any formal training on metacognition. Results indicate the 44 KTP teachers who participated in the study exhibit high levels of knowledge and awareness about metacognition, and they recognize it as a fundamental component in language teaching and learning. However, only one of the undergraduate teaching programs reviewed showed evidence of a metacognitive component in the curriculum. Rather, the sources of teachers' knowledge included the training from the *Centro Colombo Americano* and teachers' own independent inquiry. Participants felt that professional development training by the institution should be strengthened and constantly assessed.

Keywords. Metacognitive knowledge, Metacognitive strategies, Teaching practices, Teacher training and professional development, Language learning strategies

RESUMEN

El presente estudio exploró cómo un grupo de profesores de inglés del programa de niños y adolescentes del *Centro Colombo Americano* en Bogotá ha sido entrenado en el uso de habilidades y estrategias metacognitivas. La metacognición es un elemento importante del KTP, por medio del cual los profesores preparan a los estudiantes de manera explícita en el uso de estrategias de aprendizaje. La investigación indagó sobre el conocimiento y la comprensión que los profesores tenían sobre el tema de la metacognición, así como sobre las fuentes de ese conocimiento. Finalmente se indagó cómo este conocimiento podría ser transferible a las prácticas de enseñanza de los docentes. Se usaron cuestionarios y entrevistas como instrumentos para explorar la percepción y la comprensión de los profesores sobre el tema de la metacognición, así como también la instrucción previa que ellos pudieron haber recibido sobre el tema. Este análisis documental también examinó la existencia de cualquier entrenamiento formal en metacognición de los programas de pregrado de enseñanza de idiomas que los profesores habían cursado. Los resultados indican que 44 profesores del programa de niños y adolescentes que participaron en el estudio demostraron altos niveles de conocimiento y conciencia metacognitiva; y reconocieron la metacognición como un

componente fundamental en la enseñanza y aprendizaje de un idioma. Cabe anotar sin embargo, que a pesar de esta conciencia y conocimiento sobre la metacognición por parte de los docentes, sólo uno de los programas de pregrado revisados mostró evidencia de un componente metacognitivo en el currículo; las fuentes del conocimiento metacognitivo incluyeron el entrenamiento proporcionado por el Centro Colombo Americano y la indagación independiente de cada docente. Los participantes consideraron que el entrenamiento del desarrollo profesional dado por la institución debería ser fortalecido y constantemente evaluado.

Palabras clave: Conocimiento metacognitivo, Estrategias metacognitivas, Prácticas pedagógicas, Entrenamiento docente y desarrollo profesional, Estrategias de aprendizaje de idiomas.

Metacognition is not a new topic, but for years the term and its foundations were ignored. Metacognition was first introduced in 1970 by psychologist John Flavell, who describes it as control over one's own cognitive processes (Flavell, 1977). Thanks to Flavell's work and contributions, metacognition has gained more importance, also due to its impact in education and psychology, where it is possible to see a growth of interest and the development of new perspectives, including research findings that point to the positive effects of metacognition on students' academic performance and teachers' pedagogical practices.

Research on teachers' metacognitive knowledge and its transference to their teaching practice has demonstrated that teachers in general possess low levels of metacognitive knowledge and awareness. Consequently, they find it difficult to provide explicit instruction on metacognitive strategies or develop learners' metacognitive skills. This lack of awareness has been attributed to the absence of metacognitive instruction in pre-service and in-service programs. Training on metacognition has demonstrated positive effects on classroom practices. It is recommended that training in metacognition be conducted by experts with extensive experience preparing teachers due to the complexity of the topic and the time and consistency it requires. Still, studies indicate that teachers who are adequately instructed in the use of metacognitive strategies have a better and deeper understanding of the topic and may eventually foster their students' own metacognitive skills.

Metacognition, in the form of learning strategies and reflective teaching, can be found in curricula and programs today, and some schools and institutions, such as the *Centro Colombo Americano Bogotá*, feature some aspect of metacognition explicitly in their approach and instruction. The Centro Colombo Americano is a fixture in Bogotá, promoting language and cultural development for over 75 years, in programming including English courses for adults and children. All English language programs at the Colombo aim

to help students become independent and hence life-long learners by promoting student autonomy, specifically through the teaching of language learning strategies. The Kids and Teens Program (KTP) program advocates an explicit model for teaching learning strategies, requiring teachers to name strategies, explain their importance, and teach students the procedures for using them.

As metacognitive processes play such an important part of the Colombo's teaching and learning philosophy and methodology, teachers are expected to understand metacognition and know how to pass on this knowledge, awareness and skill to their students. However, it is unclear where this metacognitive expertise originates, and if indeed teachers in the program possess this competence. The question arose as to whether Colombo teachers have ever received training on metacognition, understand or feel confident about the topic, or are indeed themselves metacognitive learners. Specifically, the project sought to identify the source of teachers' metacognitive knowledge and whether they received any related training as part of their undergraduate teaching licensure programs, as well as any effects of this training on their classroom practices.

LITERATURE REVIEW

Growing research has helped metacognition gain a following, especially in education. In terms of the impact of metacognition on the professional practices of pre-service and in-service teachers, most of the research deals with teachers' metacognitive knowledge and how it transfers to their teaching. The studies point to a strong correlation between teachers' training on and awareness of metacognition and their teaching practices. Nevertheless, it is clear from the studies reviewed that teachers' level of metacognitive knowledge and awareness in general is low. In general, teachers' poor knowledge of metacognition is attributed to the lack of adequate metacognitive instruction and training. For this reason, they may struggle to transfer learning strategies and metacognitive skills to students. Ozturk (2016) and Halamih (2018) analyzed pre- and in-service teachers' understanding of metacognitive knowledge and strategies and the extent to which this understanding supported their teaching practices, discovering that teachers' knowledge of metacognition and learning strategies and how to teach with these approaches was quite low.

Other studies have attempted to differentiate teachers by establishing distinctions in their levels of metacognitive awareness, knowledge and practices. In their review, Doğanay and Demir (2011) contrasted the use of learning strategies between high and low achieving prospective teachers, discovering that high achieving prospective teachers possessed significantly higher levels of metacognition in comparison to low achieving prospective teachers. It was also concluded that the incorporation of metacognitive strategies in pre-service training is crucial. In this way, teachers become independent lifelong learners and good models their students can follow in the future.

Other studies seek to develop teachers' metacognitive knowledge in an effort to impact classroom practices. In general, positive findings can be observed in these efforts, demonstrating the important role of training. Zohar (1999) sought to foster in-service science teachers' metacognitive knowledge, particularly higher order thinking skills, through the implementation of the Thinking Science Curriculum. The TSC was found to raise teachers' metacognitive awareness in regards to their teaching of higher order thinking skills. Teachers also highlighted that metacognitive knowledge of thinking skills is essential for the design of high quality learning activities because the design process requires thinking about thinking skills as explicit goals of the learning activity. In 2006, Zohar aimed at confirming the findings from the earlier study, confirming that teachers lack abilities and strategies for teaching higher order skills and that metacognition was a new type of knowledge for most teachers. Still, it was evident that the course contributed to teachers' professional development in the area of meta-strategic knowledge compared to the beginning stages of the course. Specifically, at the end of the course, most teachers were aware of the thinking skills they had been addressing in their classrooms and were able to identify most or all of these thinking skills.

In a related study, Baraz (2012) explored the impact of applying metacognitive strategies to enhance the Nature of Science (NOS) understanding of pre-service science teachers. The results of this study showed that the use of the explicit-reflective approach had positive changes in the understanding of NOS of both groups of preservice teachers. In other words, the approach was found to be effective when seeking to improve students' understanding of the NOS. Similarly, Phillips, McElwain and Clemmer (2016) describe the results of a professional development program for math and science teachers that aimed to train participants to implement metacognitive skills and the MAST (Mathematics and Science System) to improve students' achievement in mathematics. The researchers concluded that the success of the MAST system is attributed to the integration of metacognitive skills. Further, the processes of reviewing and reflecting helped teachers improve classroom practices.

A wide range of studies have attempted to show a significant relationship between the metacognitive instruction teachers receive as part of their pre-service training and their success in real teaching scenarios. Kramarski and Michalsky (2009) sought to measure the impact of three metacognitive approaches during the different stages of learning technological pedagogical content knowledge in a web-based learning environment. The findings of this study suggest that all the three metacognitive phases applied in web-based learning were effective for fostering pre-service teachers' Self-Regulated Learning and enhancing technological pedagogical content knowledge.

METHODOLOGY

RESEARCH DESIGN

The analytical research project seeks to establish internal relationships within an event with the purpose of reaching a more profound understanding of the event (Hurtado, 2000). This design was chosen as the nature of this study required the researcher to carry out different moments of analysis in order to identify relationships and comparisons among the different variables highlighted from the theory and relate them to the data gathered during the study. Considering the aims of this study, a qualitative analytical methodology was proposed because the research sought to explore teachers' perceptions in regards to metacognition and the training received as part of their undergraduate language teaching preparation. The research was also phenomenological in nature as it aimed to define teachers' understanding of the main and related constructs, and probed into teachers' deeper awareness of these constructs and possible related constructs.

CONTEXT

This study was carried out at the *Centro Colombo Americano Bogotá*, a binational language center promoting the learning of English and culture simultaneously. The institution offers programs for adults and children. Teachers from the Kids and Teens Program were part of this study. The aim of the KTP is to prepare students to communicate naturally in a variety of everyday language scenarios. The methodology of the KTP focuses on communication and the four skills. These skills are approached in different ways in order to help students apply them in meaningful contexts.

An important part of the Colombo philosophy is the need to develop highly independent language learners. The institution promotes the development of students' autonomy through the explicit teaching of language learning strategies, and in the KTP, teachers are asked to introduce and recycle learning strategies in each lesson. Teachers receive specific guidance on this and are expected to teach students the names of the learning strategies, the steps they need to apply them, and the benefits of using a particular strategy.

PARTICIPANTS

Participants in this study were 44 teachers in the KTP program, most of whom have already completed an undergraduate teaching licensure program in English language teaching, or a similar degree. The researcher in this project is also a teacher and therefore was involved in the study as an insider researcher. In regards to this issue, Cohen, Manion

& Morrison (2007) describes how being an insider may afford the investigator more access and provide her with more opportunities to understand the phenomena. However, the participant researcher has to make sure that neutrality is preserved and the responses provided by teachers are kept confidentially in order not to lose the confidence of the participants.

DATA COLLECTION INSTRUMENTS

The research questions of this study were answered through the implementation of a questionnaire, which was answered by 44 teachers out of the 154 who currently work in the KTP program. Additionally, individual interviews were carried out after the analysis of the questionnaires with teachers who voluntarily accepted to participate. Review and analysis of the teaching licensure programs the participants attended contributed to the body of data assembled.

Questionnaire. A semi-structured exploratory questionnaire was designed with open and closed questions to analyze the metacognitive instruction teachers received as part of their undergraduate programs in English Language Teaching (Cohen, et al., 2007). The closed questions were intended to generate frequencies of responses that would help to identify patterns and make comparisons between groups and participants in the sample. The open questions were proposed with the objective of allowing participants to describe their encounters with the topic, their perceptions about metacognition in relation to language learning and teaching, and their experiences as former learners.

The purpose of this questionnaire was to inquire as to teachers' perceptions about metacognition and its relation to language learning and teaching. It also sought to explore whether teachers had received any instruction on metacognition. Informed consent was not deemed necessary for this data input as individuals who do not consent to participate simply did not answer the questionnaire.

At the beginning of this study, it was expected to have at least 75 teachers out of 154 answer the questionnaire; however, only 44 teachers responded. According to Cohen, et al., (2007), the sample size can be determined based on the style of the research chosen. For instance, in an ethnographic or qualitative research it is more likely to determine smaller samples. Furthermore, sample size can also be constrained by time, costs, administrative support and population support and the number of researchers and resources. In this case, time and population support were two critical factors when determining the size of the sample. Consequently, even though the sample size of this study is not as large as hoped, the sample size of this research exceeds 30, which according to Cohen, et al., (2007), is the minimum number of cases if an analytical approach is adopted.

Documentary review. The questionnaire asked respondents to name the universities where they received their teaching license. Based on this, the researcher analyzed documents

and information available from the most frequent universities reported in order to analyze the content of each. This analysis sought to explore the extent to which the language teaching programs might offer content related to metacognition or have integrated a metacognitive component into the curriculum. This analysis also sought to determine how complex or accurate this training has been in terms of the metacognitive component.

Interviews. Taking into consideration the information analyzed from the questionnaire and document analysis, open-ended questions were developed and carried out in face-to-face one-on-one interviews with some of the participants who volunteered for the interview at the end of the questionnaire. Focused questions were useful to probe at new variables revealed in the questionnaire, as well as clarify and contrast responses. The main objective of these interviews was to provide participants with the opportunity to share their perceptions and thoughts in a more precise manner. They were invited to share their opinions about the type of metacognitive instruction they have received, their metacognitive teaching practices, and finally their perceptions about the complexity and appropriateness of their language teaching programs in terms of metacognition.

DATA ANALYSIS AND INTERPRETATION

Questionnaire. The questionnaire featured both open and closed questions. Closed questions were analyzed based on the graphs and tabulated information provided by Google forms. The researcher analyzed the graphs and created statements about each, pointing out the significant aspects of the results. To analyze the open questions, the researcher read through all the entries and attempted to identify recurring themes. This content analysis considered these themes when creating categories of meaning to which the analyzed sections were then assigned. Finally, the analysis defined connections among categories and drew out conclusions from the answers provided by participants (Cohen, et al., 2007). Table 1 illustrates the categories formulated as a result of the content analysis executed for the questionnaire.

Table 1. Categories of recurring themes from questionnaires

Category	Code	Description
Knowledge and Thinking Development Process	KTDP	Metacognition as different thought processes that contribute to learning and the development of high order skills.
Thought Analysis	TA	Metacognition as a rational and thoughtful analysis.
Cognitive Processes Awareness and Control	CPAC	The ability to recognize her/his own learning style and how it contributes to the development of cognitive processes.
Self-learning and Reflection Strategies	SRS	The actions taken by an individual in order to facilitate and maximize his/her own learning processes. Self-assessment can be considered an example of self-learning and reflection strategies.
Autonomous and Meaningful Learning	AML	Results obtained when metacognitive skills and strategies are developed. Metacognition is the path to autonomy and meaningful learning.
Language Awareness	LA	The language knowledge one acquires through the integration of metacognition in language lessons.
Self-cognition and Improvement Process	SIP	Metacognition understood as a process that has an early stage known as self-cognition and that will eventually contribute to the improvement of practices.

Documentary Analysis. Prior (as cited by Cohen et al., 2007) explains that that "documentary analysis is a useful instrument which allows the researcher to reach information, people and subjects that are inaccessible (p. 201), yet Cohen et al. (2007) remark that the studied documents should be examined in relation to their original contexts so their significance can be comprehend. Therefore, the researcher reviewed the curricula, research groups, articles, and working papers of different language teaching programs respondents named in the questionnaire. The aim of this revision was to analyze and determine the type of metacognitive training provided to future language teachers. This information was also coded according to content analysis.

Interviews. The interview questions were drafted after the documentary analysis and the identification of further queries based on the responses of the questionnaire. In order to isolate this information, the researcher created a set of "know" and "don't know" lists to identify information already collected and questions that remained. After conducting the interview with the three willing volunteers, the researcher transcribed the recorded interviews and read through all the answers with the aim of identifying once again recurring themes. Table 2 illustrates the categories formulated as a result of the content analysis executed for the questionnaire.

Table 2. Categories of recurring themes from interviews

Category	Code	Description
Mental Process Reflection	RSPM	Refers to metacognition, which is understood as a reflective process through which the different cognitive enterprises are analyzed.
Involuntary Awareness	IA	Refers to metacognition as an involuntary act which is an innate ability of all human beings.
Conscious Actions	CA	Refers to metacognition as a process which demands individuals to be metacognitive aware in order to understand how one learns and to maximize the learning opportunities.
Ability to Control, Manage and Improve Cognitive Processes	ACMICP	Refers to metacognition as an aware and manageable process that allows learners to become better learners.
Mental Processes and Knowing Ability	MPKA	Refers to the concept of cognition as the ability one has to carry out mental processes. It can also be understood as the ability human beings have to know.
Cognitive Processes Awareness	CPA	Refers to metacognition as the ability to reflect and to consciously act over the thinking processes.

RESULTS AND DISCUSSION

The results of this study serve as a reaffirmation of the hypothesis suggested. In terms of teachers' knowledge and perceptions about metacognition, it was established that most teachers are familiarized with the term. Furthermore, teachers were also found to recognize the importance of metacognition not only in language teaching but also in different areas of education. Results also point out that the metacognitive knowledge teachers possess in most of the cases is not linked to any training received during their undergraduate teaching preparation programs, with the exception of one program which contains a metacognitive component as part of a course on autonomy for first-year students.

Regarding the transference of teachers' metacognitive knowledge to their language teaching practice, participants recognized metacognition as an essential component of their teaching, with learning strategies as the main metacognitive components featured in their English classes. Teachers attribute part of their knowledge on this topic to the training provided by the *Centro Colombo Americano*; however, most teachers reported that their real understanding and expertise on metacognition come from their personal motivation and independent learning.

METACOGNITIVE KNOWLEDGE AND AWARENESS

In terms of teachers' self-reported knowledge and metacognitive awareness, the analysis of the data reveals that almost all teachers (42 out of 44) are familiarized with the topic. In fact, most of the teachers provided suitable definitions of the term. Additionally, the responses obtained from the questionnaires and interviews showed that teachers' level of metacognitive awareness is high, which suggests that they are able to make use of metacognitive strategies and metacognitive skills as part of their teaching. Teachers were asked to elaborate on their understanding of the subject, and these descriptions were analyzed by means of content analysis, yielding the following categories of themes from teachers' elaborated explanations. (Table 3). This content analysis not only serves as a reaffirmation of teachers' self-reported understanding of the term, but also points to teachers' affirmations of metacognition as an ongoing process that positively affects learning.

Table 3. Recurring themes in teachers' elaborated explanations of metacognition

Category	Code	Description
Knowledge and Thinking Process Development	KTPD	Metacognition as the different thought processes which contribute to learning and the development of thinking skills.
Thought Analysis	TA	Metacognition as a process through which individuals carry out an analysis of their thoughts.
Awareness and Control of Cognitive Processes	ACCP	The ability to recognize one's own learning style and the way in which this style influences cognitive processes.
Self-Learning and Reflection Strategies	SLRS	Conscious actions taken by learners with the aim of facilitating and boosting their own learning. Self-assessment is considered to be one of the most outstanding self-learning and reflection strategies.

As illustrated in Table 3, teachers' definitions embrace key aspects of metacognition and reflect their high level of understanding. Their descriptions evidence comprehension and preparation. Specifically, teachers describe metacognition as a conscious and analytical process through which learners develop skills and identify their learning styles with the aim of managing thinking and learning. Metacognition is also referred to as the different strategies one incorporates with the purpose of boosting their learning. Some definitions follow:

The term metacognition refers to the thinking processes one carries out when learning.

Metacognition refers to the ability a person has in order to manage and regulate his/her own learning processes. It's been capable of observing, evaluating and taking actions over the aspect of the learning process which requires to be improved.

Metacognition is about being conscious of the mental processes.

Metacognition is the study of the cognitive processes. It includes strategies which we make use of in order to plan, monitor and evaluate such mental processes.

METACOGNITION IN LANGUAGE LEARNING AND TEACHING

This study probed further into teachers' consideration of metacognition as an important part of teaching and learning a foreign language. Figure 1 illustrates teachers' that over half of the teachers (51%) consider metacognition to be indispensable when teaching and learning a foreign language. Another group (35%) who recognize metacognition as an enabling tool in language learning and teaching, with only six teachers (14%) reporting no opinion.

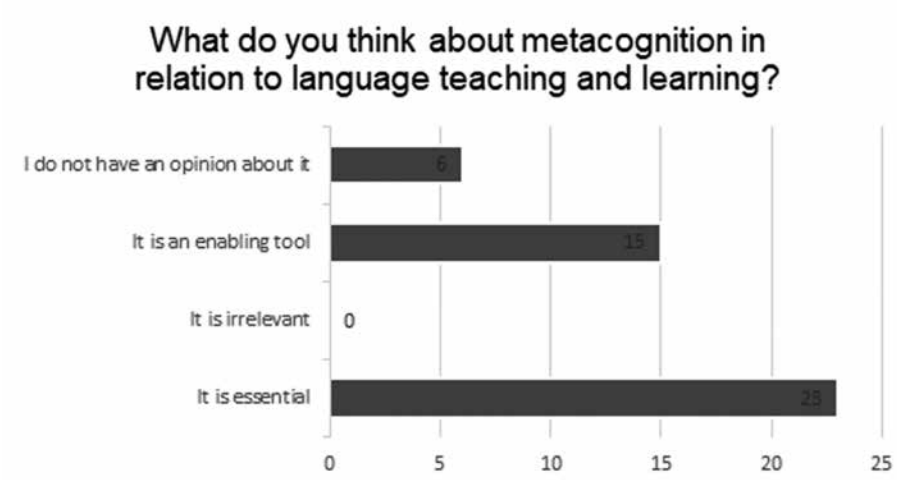

Figure 1. The importance of metacognition in language learning and teaching

The responses provided by teachers in the subsequent interviews indicate that the KTP teachers who were part of this research are aware of the importance and impact of metacognition in language learning and teaching. This suggests that metacognition has been proven as an effective tool in their English classes. The following are examples of the responses given by KTP teachers when they were asked to provide their reasons about the importance of metacognition in language teaching and learning:

It is an enabling tool for both teachers and students since it helps language learners manage their knowledge, and based on that are able to improve. Accordingly, teachers will benefit from this since students will not depend on the teacher all the time. That is to say, the more metacognitive a teacher is, the more metacognitive students he/she will have.

I consider that through the use of metacognitive strategies second language learners can cultivate a more effective learning process. In this regard, those who are taught metacognitively can easily plan, monitor and reflect upon their weaknesses and strengths.

In general terms, teachers reported that metacognition was a fundamental component in the process of teaching and learning a new language. Participants described metacognition as a tool that enhances learning in an assortment of academic contexts. Teachers also reported that their application of learning strategies played an important role in the effective development of their English classes. Additionally, it was also concluded that teachers recognize metacognitive strategies and skills as one of the most outstanding factors which lead learners towards autonomy and meaningful learning.

TEACHERS' METACOGNITIVE PREPARATION

In regards to any training teachers had received on metacognition, teachers attribute their understanding of metacognition to the training provided by the *Centro Colombo Americano*. As such, it was revealed that none of the language teaching programs analyzed provide teachers with well-structured or ongoing training on the use of metacognitive strategies and skills in teaching.

Undergraduate programs in foreign language teaching. Teachers' responses to the questionnaire and interviews clearly show that the metacognitive instruction provided by language teaching programs is limited at best, and most often completely absent. This is noteworthy considering the fact that metacognition has become one of the most trending issues in today's education. An analysis of four teaching programs, those with the most alumni from the group of participants, considered materials and information available on the institutional websites regarding program curricula, PEPs[1], articles, working papers and research projects. The universities analyzed included the *Institución Universitaria Colombo Americana- ÚNICA, Universidad Nacional de Colombia, Corporación Universitaria Minuto de Dios* and *Universidad Pontificia Javeriana.*

This review revealed that language teaching programs are not equipped to prepare teachers to incorporate metacognition as part of their teaching practices to provide students with strategies and skills that contribute to meaningful and maximized learning

[1] Proyecto Educativo del Programa –Curricular Statement of the Degree Program

opportunities. ÚNICA was the only university found to provide its students with specific instruction on metacognition by means of the course "Theory and Practice of Autonomous Learning." The remaining universities analyzed have pedagogy subjects in which the topic is covered superficially, which indicates that teachers' metacognitive knowledge and awareness does not come from their undergraduate teaching preparation.

Although metacognition has been recognized as one of the essentials of education, most of these universities have not included this component in their curriculum for future teachers, or at all. After examining the Institutional Educational Projects (PEIs), and Programs (PEP), it was found that most of the universities do not mention metacognition in their mission or vision statements nor in any of the sections of their PEPs. Again, ÚNICA's PEP is the only one that contemplates important aspects of metacognition such as learning how to learn, learning and teaching strategies, and autonomous thinking. These results raise an entire discussion around the quality and breadth of the training provided to language teachers. Teachers who have not received thorough training on metacognition are more likely to fail in the process of guiding students towards autonomy and self-regulation.

Finally, in terms of research projects it was found that only the *Universidad Nacional de Colombia* has a research group working with the topic of metacognition, "Pedagogy of Autonomy and Development of Thinking,"[2] which evidences a general lack of attention towards research about an issue that has been effectively proven to improve teaching and learning practices. One interviewee explained:

> *What happens when a teacher has not been trained on metacognition? A teacher who does not receive instruction on this topic most likely does not know how to help students to develop their skills, and that is what I would call an educational tragedy.*

The Centro Colombo Americano. After analyzing teachers' responses and concluding that their language teaching programs do not provide any training on metacognition, it became indispensable to determine the source of teachers' metacognitive knowledge. The questionnaire and interviews revealed that the workplace of KTP teachers, the *Centro Colombo Americano,* is the source of training in metacognitive components such as learning strategies. During the interviews, teachers reported that the *Centro Colombo Americano (CCA)* promotes metacognition through their incorporation of learning strategies as a key program component. However, it was also concluded that the training provided on the topic is limited, and more time is required in addition to follow-up in relation to the different ways in which these practices can be improved:

> *Part of my metacognitive knowledge might come from the CCA but still I consider it was kind of superficial because during the training we did not really have enough time to*

[2] Pedagogía de la autonomía y desarrollo del pensamiento

consciously approach the topic. In fact, the first times I had to teach learning strategies I did not feel comfortable because I felt unprepared to do so.

I think the CCA has truly clear what assessment and learning strategies refer to and why their implementation is so important. The real issue is that the training provided does not have a follow-up. We teachers fail to effectively apply these principles and the real significance of these metacognitive strategies get lost. I consider that the training needs to be reinforced and teachers need to be aware of the fact that assessment is not something that takes place in five minutes but instead it is an ongoing process that could take a whole semester for students.

I am convinced that the Colombo has deeply understood from its principles what metacognition is. In fact, the learning strategies and assessment are proof of that. However, I feel we need a well-focused training through which we teachers are able to learn how to teach by means of metacognition. Besides that, it is also crucial that teachers understand that metacognition is not something that happens overnight; instead, it is a process that requires time, patience and expertise.

The responses provided by teachers in regards to the metacognitive training provided by the Colombo indicate that this training has contributed to teachers' high levels of understanding of the process, applicability and effectiveness in language teaching; however, it is still necessary to reinforce the process as such. That is to say, teachers require more follow-up and feedback in order to effectively and authentically incorporate metacognition into their English classes.

TRANSFERENCE OF METACOGNITIVE KNOWLEDGE INTO CLASSROOM PRACTICE

Another important aspect of this study was to discover how teachers' metacognitive knowledge transferred to their English lesson. The responses of teachers in the questionnaires and follow-up interviews in relation to this suggest positive results since their teaching practices to a great extent reflect the metacognitive knowledge they have acquired. It was found that 29 out of 44 teachers affirmed that they incorporate metacognition in their teaching practice while the remaining teachers reported not doing so. After examining teachers' responses in regards to this issue, it was clearly established that metacognition was a significant component of their classroom methods. Teachers reported different metacognitive classroom strategies and skills which they make use of in different moments of their classes.

Metacognitive strategies. Content analysis of interviews was carried out in order to identify and establish significant relationships among the different forms of metacognitive classroom strategies and skills teachers make use of in their English classes. After carrying out the content analysis process, it was concluded that teachers who reported making effective

use of metacognition in their English classes mentioned assessment, learning strategies, reflection, planning and monitoring as the most outstanding forms of metacognition in their classes.

Table 4 points out that Planning, Monitoring, Learning Strategies, Assessment and Reflection are the most outstanding strategies teachers incorporate in their classes as a means of developing their young learners' metacognitive skills. In accordance with teachers' descriptions *planning* is the first stage of the process in which learners identify the goal of the task and think about the different steps to be taken to accomplish such goal. The *monitoring* has been described as the phase that comes after *planning* and during which learners carry out their plans and keep track of their process towards the goal that has been established. In addition, teachers also mentioned *learning strategies* and they referred to them as techniques and tools one makes use of in order to boost learning. Moreover, *assessment* was also mentioned and it was described as an ongoing process that can be developed by the teacher, by peers and learners themselves. The main objective of this process is to evaluate what has been achieved and carry out an action plan in relation to the goal that has been established. There different types of assessment: self-assessment, peer-assessment, group-assessment, etc. Finally, teachers made reference to *reflection as* to an essential part of the rest of the process in which students self-question themselves about what the things they have done.

Additionally, it could also be concluded that teachers' integration of these metacognitive strategies is largely due to the fact that the methodology of the Centro Colombo Americano requires KTP teachers to incorporate learning strategies and assessment in their English lessons and in fact the incorporation of these two main components are part of the supervision performance plan teachers are evaluated through every semester.

Table 4. Categories of recurring themes from interviews in relation to the metacognitive strategies applied in their classrooms

Category	Code	Description
Planning	P	It refers to the initial phase of metacognition in which learners think about the learning goal the teacher has set and consider how they will approach the task and which strategies they will use.
Monitoring	M	It refers to another phase of metacognition in which learners implement their plan and monitor the progress they are making towards their learning goal established by the teacher at the beginning of that lesson.
Learning Strategies	LS	It refers to the different techniques learners develop as the learning process is taking place. These strategies are considered tools that facilitate the language learning process.
Assessment	A	It refers to an ongoing process that can be developed by the teacher, by peers and learners themselves. The main objective of this process is to evaluate what has been achieved and carry out an action plan in relation to the goal that has been established. There different types of assessment: self-assessment, peer-assessment, group-assessment, etc.
Reflection	R	It refers to a fundamental part of the plan-monitor-evaluate process. In other words, learners are encouraged to self-question throughout the process will support this reflection.

CONCLUSIONS

This analytical qualitative research aimed at exploring the extent to which language teachers working in the Kids and Teens Program at the *Centro Colombo Americano, Bogotá* have been trained on the application of metacognitive strategies and skills. Besides, this study also sought to inquire about the type of instruction these teachers have been provided with and how this instruction on metacognition transferred to their language teaching practices. The results gathered by means of a questionnaire, interviews and a documentary review have demonstrated both positive and negative outcomes.

In regards to teachers' metacognitive knowledge and awareness, it could be established that they believe they possess a high degree of knowledge about the topic. Additionally, teachers have also been found to recognize metacognition as an important component which can positively affect teaching and learning. In relation to teachers' classroom practices, it could be determined that due to their strong understanding of the topic, positive effects in

classroom practices can been evidenced. Furthermore, it was also concluded that language teaching programs do not provide teachers with a well-structured training on metacognition since it is sometimes superficial or completely absent. Therefore, teachers' metacognitive knowledge is not linked to their undergraduate language teaching preparation; instead, part of this knowledge and expertise has been attributed to the training provided by the *Centro Colombo Americano*. Nonetheless, it was also concluded that this training also needs to be strengthened due to the complexity of the metacognitive component.

Metacognition is an issue that has gained more recognition over the last years due to the positive effects it has been proved to produce in different areas of education (Flavell, 1979). The findings of this study resemble to a great extent to the results of the literature reviewed but there also aspects in which the results of this research differ to a great scale from the rest of studies. Teachers' metacognitive knowledge is one of the main components of this research. In regards to this aspect, Zohar (2006) indicates that teachers lack metacognitive knowledge and strategies for teaching. Likewise. Ozturk (2016) concluded in his study that preservice elementary teachers were found not to be equipped with the skills to teach metacognitively. The results of these studies result to be contradictory to the results of the present study through which it has been demonstrated that teachers reported high levels of metacognitive knowledge and awareness.

Additionally, in relation to metacognition and teachers' practices, Doganay and Demir (2011) also pointed out in their study that metacognition has a positive impact on teaching practices. In another study, Heller, Daehler, Wong, Shinohara, & Miratrixet (2012) concluded that providing teachers with instruction and professional development courses focused on metacognition have been found to have positive effects on students and teachers' outcomes, which highly supports the results of this research in which teachers reported that metacognition as an enabling tool for boosting students' learning and development of their skills.

Finally, the results of the present study in regards to the incorporation of metacognition as an essential component of teachers' training are also backed up by the findings proposed by Allinote (2013), in which it was concluded that teacher education programs should be better equipped with instruction in how to teach applying a self-regulatory approach. The documentary review carried out with the purpose of analyzing language teaching programs formal instruction on metacognition contributed to conclude that these programs need to be modified and adjusted in order to meet the goal of preparing metacognitive teachers who are able to transfer their knowledge into their classroom practices.

Among the limitations that were found during this research can be mentioned the difficulty to find participants to answer the questionnaire. The process of finding participants who voluntarily wanted to respond the questionnaire was time consuming and still it was not possible to get the expected number of teachers to answer. Additionally, it would have been quite interesting to have conducted classroom observations in order to have a direct evidence of teachers' practices in relation to the metacognitive knowledge transference

they have reported. Finally, not having had the time to design and propose a training on metacognition for KTP teachers was another limitation of this research project.

For future research, it would be interesting to seek out more teachers as the research would be more conclusive. Additionally, it would be necessary to find out more details about their classroom practices via direct observations since during this study was not possible to reach direct evidence of their methods and procedures in regards to metacognition. Besides that, it would also be pertinent the design and application of a metacognitive training for teachers, receiving teachers' feedback and allowing them to participate in the creation or the improvement of a training program aiming to covering their own needs based on their experience.

ACTION PLAN

For teachers

- Inquire more about metacognitive teaching practices and make sure that knowledge on this subject is being used as a means of contributing to the maximization of students' learning opportunities.
- Become the metacognitive models for students and encourage them to become lifelong and conscious learners.

For universities

- Ensure teacher training and preparation for appropriate application of metacognitive strategies and skills.
- Incorporate metacognition as part of the institutional principles and support future teachers in the process of becoming metacognitive educators.
- Carry out more research projects that relate to metacognition and autonomous learning.

For the Centro Colombo Americano

- Strengthen the training provided to teachers and devote more time to the effective teaching of metacognitive strategies.
- Design a follow-up plan for assessing teachers' understanding of these concepts and guarantee the accurate and meaningful implementation of these processes.

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CHAPTER 9

THE IMPACT OF NON-EXPLICIT TEACHING STRATEGIES FOR METACOGNITION ON THE METACOGNITIVE AWARENESS OF FIFTH-GRADE STUDENTS

DIANA RUIZ CENDALES

The issue of whether or not to be explicit with students about metacognition and learning strategies is one that teachers grapple with. Some argue that technical terminology might get in the way of training students to think metacognitively. Others advocate the adoption of simplified or student-friendly language to refer to more complex strategies. The issue lies only partially in the terminology. Teaching metacognition explicitly implies a shared language between and among teachers and learners. Diana Ruiz found that efforts by St. George's School and its teachers to develop metacognition did result in some awareness of this in both instructors and students. However, a clear lack of shared language to talk about metacognition also resulted in only partial awareness and adoption of metacognitive strategies by students, as well as confusion on the part of teachers as to what does and does not constitute metacognitive training. She advocates a metacognitive toolkit for teachers, explicit teaching for students, a common language for everyone to enhance understanding of metacognition, as well as ongoing measurements and impact assessments of both teacher practices and student awareness.

ABSTRACT

The purpose of this study was to explore the metacognitive awareness of 11- to 12- year-old learners at Saint George's School who had been exposed to different metacognitive strategies in academic subjects as part of their regular curriculum. It also intended to observe the notions and approaches towards metacognition of these pupils' teachers and the effect of their procedures on students' abilities to recognize and regulate their learning. To accomplish this, data was collected employing various instruments, including a questionnaire that was applied to 94 students to assess their metacognitive awareness, an interview conducted with eight teachers to identify their ideas and procedures regarding metacognition, documentation of assorted metacognitive strategies that were implemented in the classroom by the teacher-researcher, and reflective journal entries throughout the process. The data were examined using content analysis. The results of this research indicate that fifth-graders' identification of their *knowledge of cognition* faculties was higher than their *regulation of cognition* aptitudes. Fifth-grade teachers acknowledged clear conceptions of metacognition and its usefulness, but some of the procedures they reported were not clearly framed by metacognition. It was also possible to identify a lack of common language to speak about metacognition. The future construction of a *metacognitive toolkit* would be an opportunity to structure the metacognition module of the curriculum endorsed at the school to help students improve their overall metacognitive skills and awareness.

Keywords: Metacognition, Metacognitive awareness, Metacognitive approaches, Teaching metacognition

RESUMEN

El propósito de este estudio fue explorar el reconocimiento que los estudiantes de 11 a 12 años del Colegio San Jorge de Inglaterra tenían sobre sus estrategias metacognitivas después de haber estado expuestos a ellas como parte del currículo regular. Esta investigación además, buscó observar las nociones y las aproximaciones a los conceptos y estrategias de metacognición utilizados por los profesores de estos estudiantes; así como los efectos que las prácticas de estos profesores tienen en la capacidad de los estudiantes para reconocer y regular sus procesos de aprendizaje. Para tal fin, se recogió información utilizando diversos instrumentos entre los cuales se encuentran un cuestionario que se aplicó a 94 estudiantes para medir su familiaridad con este tema; una entrevista realizada a ocho profesores para identificar sus ideas y prácticas acerca de la metacognición; un diario de campo y una serie de estrategias metacognitivas que fueron aplicadas en clase con varios grupos de estudiantes a lo largo del proceso. La información recolectada se analizó siguiendo el análisis de contenido. Los resultados de este proyecto mostraron que los estudiantes de quinto grado tienen mayor familiaridad con acciones relacionadas con el reconocimiento de su aprendizaje que con su capacidad para monitorearlo y regularlo. Los profesores ofrecieron definiciones claras acerca de la metacognición y sus beneficios, sin embargo algunas de las prácticas que

mencionaron no se enmarcan explícitamente como prácticas metacognitivas. Se identificó también la ausencia de un lenguaje común referido a la metacognición. La construcción de un manual metacognitivo será, sin duda, una oportunidad en el futuro para estructurar el módulo de metacognición del currículo escolar para ayudar a los estudiantes a mejorar sus habilidades y conciencia metacognitivas.

Palabras clave: Metacognición, Conciencia metacognitiva, Estrategias metacognitivas.

Metacognition lays down the roots for lasting and significant learning. Reflecting on the way one learns promotes conscious learning and fosters deeper understanding. In addition, metacognition directs education towards the students and encourages autonomous learners. Awareness of one's learning process promotes the development of more complex intellectual abilities, higher thinking skills, and critical evaluation.

According to Halpern (1998), metacognition is "the ability to use knowledge to direct and improve thinking skills" (as cited in Magno, 2010, p. 138). Studies have demonstrated that the development of metacognitive skills supports the improvement of creativity and critical thinking abilities, two 21st Century skills. Furthermore, the development of metacognition in students improves academic performance as well as engagement in the classroom. Research has also shown that metacognition is an ability that can be developed when the corresponding learning models are applied. Students may develop their metacognitive skills when exposed to these techniques, gaining long-lasting knowledge. Although the use of metacognitive strategies may be more challenging for teachers, these practices are worthwhile when considering the resulting benefits for students' learning process, academic performance, motivation, creativity, critical thinking skills, problem-solving abilities, and level of discussion, among others.

Exposing young students to metacognitive learning models encourages the possibilities for developing metacognitive skills from early stages. As studies have demonstrated, metacognition matures along with age. Students' early exposure to metacognition is a step towards the development of solid reflective learning abilities and positive results.

At Saint George's School, principals have been interested in fostering students' metacognitive skills in all grades and have promoted the use of metacognitive models among teachers. Since 2018, teachers at the school have been asked to record the methods they use for strengthening metacognition in their lesson plans, which are reviewed together with Heads of Departments. Teachers have also participated in both compulsory and optional courses on metacognition, framed within the parameters of the Cambridge International curriculum.

In spite of these targeted efforts, not all teachers at the school have been provided with detailed information about how to implement metacognition. Many teachers have been applying metacognitive strategies with their pupils, but not directly or explicitly. This has resulted in the emergence of personal conceptions about the topic and a lack of a common language to talk about metacognition and its methodologies, both for instructors and students.

Despite teachers' implementation of these strategies in the classroom, there is also a lack of systematic appraisal of the ways these actions might impact students' abilities to recognize and regulate their learning processes. Further, other than academic grades, instructors have not had access to a structured framework for determining whether pupils have progressed in their thinking or regulation of their learning. In addition, there has been no evaluation of whether learners might have developed other aptitudes as a result of their efforts to foster metacognition.

In sum, the school has offered its teachers an open and conducive environment for experimenting with teaching and learning techniques, especially those related to metacognition. Nonetheless, this has not translated into a clear, cohesive educational program to address metacognitive strategies in the classroom, nor their impact on students. For these reasons, this project aimed to explore the metacognitive awareness of fifth-grade students at Saint George's School who have been indirectly exposed to metacognition. The study also intended to inquire as to fifth-grade teachers' familiarity and perceptions about metacognition who have applied different strategies to stimulate it in their students. Finally, this investigation sought to examine the way metacognition has been implemented at the school in order to provide long-term suggestions for structuring teachers' work for applying metacognition with students.

LITERATURE REVIEW

DEVELOPING METACOGNITION IN STUDENTS

Studies show that metacognition can be developed in the classroom when metacognitive learning models are used. Students who are exposed to these models demonstrate a deeper and more meaningful understanding that leads to long-lasting knowledge. Although the application of metacognitive learning models might be more challenging for teachers than the traditional models, learning environments benefit when metacognition is promoted: the classroom is nurtured with richer discussions and more engaged students.

De Jager, Jansen, and Reezigt (2007) compared the improvement of students' metacognition in diverse learning environments at a primary school in The Netherlands. This research found that students' metacognitive skills progress when they are exposed to metacognitive learning environments, such as direct instruction and cognitive apprenticeship.

Blank (2000) proposed the Metacognitive Learning Cycle (MLC), which is a revised learning cycle model that focuses on formal opportunities for teachers and learners to discuss their ideas and the status of their conceptions about a subject (science). The use of this pedagogical orientation proved to strengthen the interaction between the learners' ideas, experiences, and understanding regarding the theme studied. Students who were exposed to a metacognitive approach did not improve their understanding in comparison to the control group, but they did build deeper knowledge that remained over time. Moreover, the MLC classroom environment improved, with more engaged students who actively participated in more reflective discussions. Nevertheless, the teacher of the MLC perceived this as a more challenging model as students became more critical of the teaching method and the concepts worked in class. They asked the instructor to sustain his speech using the same principles that they were expected to use when expressing their ideas. In addition, the class pace became slower due to students debating scientific concepts even though they understood them.

Ribeiro and Neto (2008) explored the feasibility of enhancing students' thinking abilities through the application of new technologies in the classroom and metacognitive guidance. Moreover, they expected to develop students' cognitive and metacognitive skills while promoting positive feelings and attitudes toward the study of natural sciences. The research demonstrated that the development of metacognitive skills positively influences student behavior. The intervention was thought to promote more positive attitudes towards the natural sciences and benefit the learning of new concepts.

Vainikainen, Wüstenberg, Kupiainen, Hotulainen, and Hautamäki (2015) examined how learning to learn (LTL) skills, which are defined as "general cognitive competences and learning-related motivational beliefs" (p. 376) evolve throughout primary school. They also explored how LTL skills may foretell students' complex problem-solving competences. For six years the researchers followed the progress of 608 students in an urban school in Finland who were attending fourth to sixth grade. This study concluded that the development of thinking and problem-solving skills at school is strongly associated but not defined by students' initial cognitive competences at the beginning of formal education, and the advancement of their motivational and intellectual LTL competences during schooling.

Annevirta and Vauras (2010) studied the long-term progress of young students' metacognitive skills based on their verbal and nonverbal accomplishments in a problem-solving assignment. They also observed the connection between metacognitive skills (MS) and metacognitive knowledge (MK) in relation to students' age. The research was held in 14 kindergartens and four primary schools in Finland with 42 children 6 to 8 years of age. The study showed that there was a significant relationship between children's MK and MS. "Those children who expressed high-level knowledge about the factors and strategies affecting cognitive activity (MCK test) could also better regulate their performance (MS task) as early as preschool" (Annevirta & Vauras, p. 219) These students also improved their performance and cognitive capacity, employing purposeful self-directed dialog. They became responsible for their learning, and hence, more independent learners. Conversely, students with lower MK proved to be less capable of managing their cognitive capacity,

and their self-directed behavior appeared to be more adult-dependent. Moreover, students with high MK recognized the importance of checking their answers compared to the assignment's instructions, and they proved to be more detailed and comprehensive when evaluating their performance. Annevirta and Vauras posit that the primary task of a teacher is offering students verbal support and making "children's thinking and problem-solving processes (i.e., their inner speech) visible to the children and to themselves" (p. 220) to develop students' self-regulatory ability. Only then might students be able to control their cognitive and motivational performance.

Çalişkan and Sünbül (2011) explored the impact of providing learning strategies for the development of metacognitive knowledge, the use of metacognitive skills, and the performance of sixth-grade students. The study was carried out at two urban primary schools in Turkey. The researchers compared the achievements of two different groups: one experimental group (21 students) to which strategy instruction was given, and a control group (21 students). The study found that teaching-learning strategies improved students' consciousness about the use of learning strategies. Moreover, students improved their metacognitive knowledge and their use of metacognitive skills. These resulted in better academic performance for these students compared to the control group. The students who were taught learning strategies showed the capability to select and apply a strategy, checked their outcomes, and tried a new strategy to reach better results when needed.

THE IMPACT OF METACOGNITION

The development of metacognition stimulates students' critical thinking skills, problem-solving abilities, and creativity. It also positively affects their school performance, behavior, the quality of their discussions, and their engagement with learning. Studies demonstrate that metacognition in young students is domain-specific while older students (from 13-years-old approximately) have more general metacognitive skills, suggesting that metacognition develops with age. Moreover, research suggests that metacognitive skillfulness is partially independent from intellectual capacities in terms of predicting students' learning performance. These two abilities develop in a parallel fashion during the growth of a student.

Van der Stel and Veenman (2010) studied the progress of both the frequency with which metacognitive skills are applied (quantity) and the depth (quality) of metacognitive abilities in secondary students. They also explored whether the development of metacognitive ability is associated with intellectual ability (intelligence). The researchers worked for two consecutive years with 32 secondary school students (from 12 to 14 years old) in the Netherlands. This research found that the quantity and the quality of metacognitive abilities evolve over the years: 14-year-old students demonstrated superior metacognitive activities than 13-year-old students. Moreover, the results showed that metacognitive capacities (Meta) impact students' learning performance (LP), partially detached from

their intellectual ability (IA). An equivalent growth was found of metacognitive skillfulness and intellectual capability as factors for predicting the learning performance. Lastly, the researchers argue that metacognitive capacities begin separately in different assignments and fields. Around 12 years of age, these capacities join into a more general inventory, which can be applied and transferred across assignments and fields. Students at this age use both general and domain-specific metacognitive abilities while they are in a "transitory phase of metacognitive-skill development" (Van der Stel and Veenman, p. 224).

Likewise, other researchers studied if metacognitive growth is dependent on the development of intellectual skills. They also investigated if students of different ages use metacognitive abilities in a general or domain-specific way. Veenman and Spaans (2005) worked with first- and third-year students of a secondary school in The Netherlands (12 and 15 years average respectively). Veenman, Wilhelm, and Beishuizen (2004) included fourth, sixth, and eighth-grade students from different urban areas in The Netherlands as well as university students. These studies demonstrate that metacognitive competence evolves at the same time as intellectual ability, but not dependently. They also showed that during early learning phases or when the novelty or complexity of a task is high, metacognitive capacities begin the learning process rather than intelligence. Like Van der Stel and Veenman (2010), these studies concluded that metacognitive skillfulness and intellectual abilities are comparable for predicting learning performance. Veenman and Spaans (2005) also argue that younger students handle domain-specific metacognitive skills while older students can integrate these skills and transfer them to different assignments and fields. Finally, Veenman et al (2004) posit that the beginning of metacognitive-skill development takes place around 9.5 years of age.

Bakracevic Vukman and Licardo (2009) examined how diverse aspects of self-regulation (cognitive, metacognitive, motivational, and emotional) influence the academic achievements of adolescents and young adults. They included in their study participants from different age groups: 14-15, 17-18, and 22-23 years of age. The researchers found that the self-regulation in all aspects diminish in students from 14 years of age (end of primary school) until they are around 18 years of age (end of secondary school). Afterwards, self-regulation gradually increases until the age of 22 (undergraduate students). Following the results of this study, Bakracevic Vukman and Licardo (2009) affirm that "metacognitive self-regulation persists as an important predictor of school achievement at all levels of education" (p. 266). They also state that the motivational self-regulation has a substantial effect on academic performance in the first and second age groups (not in the undergraduate students). Nonetheless, cognitive and emotional self-regulation does not considerably impact the performance of any of the age groups.

Roebers, Schmid, and Roderer (2009) explored metacognitive monitoring and control procedures used by third and fifth-grade students while solving a previously learned knowledge test, and the effect of these metacognitive abilities on academic outcomes. The participants of the study came from seven different schools in Switzerland. This study found declared that by age 9 children can handle monitoring skills relatively well, which allows

them to differentiate correct and incorrect answers. At this point, these skills might still be refined, particularly when monitoring ambiguous situations. Additionally, 11- and 12-year-olds proved to better manipulate control procedures to improve their test results than 9- to 10-year-olds. This research proved the effect of metacognitive abilities in students' academic performance and recorded their tactical activity in test-taking. It also confirmed the development of monitoring and control skills through children's maturation.

Magno (2010) investigated the effect of metacognition on the acquisition of critical thinking skills. This study included students from various colleges and universities in the Philippines. Through the application of a model that employed metacognition for predicting critical thinking, the researcher found that the students' capacity of controlling their knowledge and thinking processes notably impacted their ability to think critically. He affirmed that when learners control their cognitive processes, they may be more critical to the information they receive from the environment. Metacognition and critical thinking amplify the learning process. Moreover, Magno (2010) points out that "higher-order thinking (like critical thinking) requires executive control and executive processes (that comes in the form of metacognition)" (p. 149). Therefore, the study concluded that critical thinking can be reached throughout the acquisition of metacognitive strategies.

Cornoldi, Carretti, Drusi, and Tencati (2015) studied the possibility of enhancing problem-solving abilities in students through the implementation of a training program which concentrated on metacognition and working memory. It included activities directed to improve the "controlled executive components of working memory and metacognitive knowledge about problem-solving" (Carnoldi, et at., 2015, p. 426). The researchers worked with primary school children from third, fourth and fifth grades at a school in Italy (students from 8 to 10 years of age). The training program used in this study allowed students to improve their performance in metacognitive and working memory assignments. Moreover, their problem-solving abilities improved and were maintained over time.

Hargrove (2012) explored the long-term effect of metacognitive strategies and learning theories on students' creativity. The researcher aimed to provide teachers with practical tools, including technology, for utilizing metacognition in their practice. This study worked with design students in their first year of college and observed their improvements in creative thinking when they finished their four-year undergraduate program. Students were exposed to different types of instruction based on a metacognitive approach. The learners who were involved in these interventions demonstrated higher levels of creative thinking. According to Pesut (1990), the creative basic abilities included action-oriented metacognitive strategies (in Hargrove, 2012, p. 492). Hargrove affirms that students improve their creative thinking when they develop their metacognitive thinking, arguing that when people are conscious of the way they think (knowledge of cognition), they are more aware of predispositions and preconceived notions, which allow them to develop superior creative thinking skills that may apply in very different fields. Hargrove stresses that students who practice metacognition, which includes knowledge and regulation of cognition, can develop conditional, declarative and procedural knowledge, which allow them to use, modify and link current creative processes for creating new processes (p. 515). Hargrove concludes in this way:

> Being creative is more than simply coming up with a big idea. It involves a set of behaviors; the way we see, feel, think and do every day. But when we see, feel, think and do things as we've always seen, felt, thought and done them before, our ideas will undoubtedly be the same. Having awareness and understanding of our thought processes in a way that informs, engages and inspires is vital for our continued personal and professional development in today's competitive world. (p. 515)

METHODOLOGY

RESEARCH DESIGN

The methodology for this investigation was based on *ex post facto* research as it looked retrospectively at the way metacognition has been approached at Saint George's School and analyzed this. Specifically, the study inquired into the metacognitive awareness of 11- to 12-year-old pupils who have been exposed to implicit strategies for reflecting on what they know and on how they monitor and control the way they learn. The project explored the ideas of these pupils' teachers, who applied metacognitive procedures instinctively, according to the information they received at the school. Cohen, Manion, and Morrison (2007) describe how *ex post facto* research "investigates possible cause-and-effect relationships by observing an existing condition or state of affairs and searching back in time for plausible causal factors" (p. 264). Considering this appreciation, the present study fits with the *ex post facto* research model since it sought to establish possible relationships between the way fifth-grade teachers at the school apply metacognition as well as students' ability to reflect on their knowledge, declare what they know or do not know, and regulate their learning. Consistent with the characteristics of *ex post facto* (Cohen et al., 2007), the researcher in this study reported what was happening at the school, with the intention of providing the basis for a future organization of approaches towards metacognition.

Furthermore, this study correlates with the *systematization of experiences* approach that Gordón (2010) defines as a qualitative research method directed towards the development of new knowledge based on the critical reflection of previous actions (p. 28). The systematization of experiences intends to propose innovative transformations of analyzed practices. According to Peresson (1997), the systematization converts one's activities into the object to be studied, analyzed, and transformed (as cited in Gordón, 2010, p. 29). This method incorporates the perceptions of different actors and considers the context of the experiences as well. Jara (1997) affirms that this approach offers a critical interpretation of an event, useful for understanding the present situation of the context in which it took place (as cited in Gordón, 2010, p. 30). This approach systematizes a procedure, examines it, and states conclusions and new perspectives of the observed situation (Gordón, 2010). Following this approach, this study explored the way metacognition has been implemented at the school with the purpose of informing potential actions for the future. The researcher

was immersed in the study, examining her own and other teachers' practices. This research focused specifically on fifth-grade learners and instructors, but it expected to provide knowledge that might be relevant to the institution in general.

CONTEXT

The study was held in Saint George's School (SGS), a private school of British origin, founded in 1958 by Mrs. Mary Allen de Acosta in Bogotá, Colombia. Saint George's School aims to educate students towards excellence in every aspect of life within a context of respect for everyone's opinions and beliefs. This school endeavors to cultivate the healthy human and spiritual growth of its pupils, based on the development of values, solidarity, tolerance for diversity, and respect for all beings on our planet. Founded on honest work, self-discipline, and solidarity, this school is framed within an ethical context for collaboration to solve the country's problems. Saint George's School has become a well-recognized institution in the country for offering high-quality academic education in preschool, primary and secondary school (Saint George's School, 2011).

Recently, the school has directed its attention to adopting innovative and assertive teaching and learning practices. In 2012, it became a Cambridge International School and began incorporating the Cambridge curriculum (Dye, n.d.). To this aim, instructors have been provided with resources and instruction, along with teaching training programs to support positive and effective educational experiences. Cambridge International integrates methodologies such as *active learning*, *collaborative learning*, and *metacognition* (Dye, n.d.).

In spite of this support, not all teachers have had access to direct instruction about the implementation of metacognitive strategies nor do they share a common language to refer to metacognition. Consequently, individual interpretations have arisen around this notion and its procedures. The school does not possess a common metacognitive teacher toolkit, which might be used to stimulate metacognition in the classroom. In the Geography and Economics Department, the Department Head shared a portfolio with teaching staff containing detailed information on how to promote metacognition through various strategies. This document became a useful tool for the teachers of this section to support students' reflections on their cognitive processes. Nevertheless, it is unclear if this experience extends to all academic departments at the school.

For developing this research at the school, the teacher-researcher sought and obtained approval from the headmaster, including permission to implement metacognitive strategies with students, carry out teachers' interviews, and develop and apply the questionnaires.

PARTICIPANTS

The participants of this research were fifth-grade students from Saint George's School, aged 11 to 12 years old. A total of 94 pupils answered the adjusted *Metacognitive Awareness Inventory*, while a smaller and varying number participated in metacognitive class exercises applied during the study. Several fifth-grade teachers were also involved in this investigation: eight instructors from different subject areas accepted to participate in the interview and gave their informed consent for this purpose. In addition, the researcher assumed an active role in this study. She was a complete participant in the investigation (Cohen et al., 2007), as she is one of the fifth-grade subject teachers at Saint George's School. The researcher has been working on the planning and execution of metacognitive procedures in her classes. She has observed the reaction of pupils and the postures of her colleagues towards the development of metacognition at school.

DATA COLLECTION INSTRUMENTS

Questionnaire. A questionnaire was applied to fifth-grade students to identify their familiarity with their cognitive tasks. It was applied in students' first and second languages in order to ensure accurate understanding. The questionnaire was an adjusted version of the *Metacognitive Awareness Inventory (MAI)*, created by Schraw and Dennison in 1994 "specifically for adult learners to bring awareness of metacognitive knowledge and metacognitive regulation" (Knaack & Robertson, n.d., p. 2). The original MAI contains 52 statements related to these two elements of cognition and is accompanied by its scoring guide. A simplified version of the MAI with 25 statements was used with 94 fifth-graders at the school (Appendix A). Following the recommendation by school directors, informed consent from learners' parents was not obtained as student participation was non-compulsory, and those who did not desire to take part could simply not respond to the questionnaire.

Interviews. Eight fifth-grade teachers from different subject areas were interviewed using the *unstructured interview* model, which is an "open situation" ruled by the goals of the study (Cohen et al., 2007, p. 355). The interviews allowed the researcher to perceive teachers' conceptions, beliefs, and procedures regarding metacognition. Participants granted their informed consent in writing before the interviews.

Metacognitive strategies classroom implementations. The teacher-researcher carried out the following metacognitive strategies with fifth-graders during the school year. These teaching strategies were documented and analyzed in order to observe evidence of learners' metacognitive processes. The strategies included two *Exam Wrappers* (Millis, 2016), *The Minute Paper for Papers* (Millis, 2016), the strategy *I used to think, now I know*, and the activity *What did we do?* These strategies will be described in the Results and Discussion section as they were implemented by the teachers interviewed as well.

Reflective journal. The researcher documented her perceptions of the ways that students reacted to the metacognitive strategies employed in the study in a reflective journal, following the *semi-structured observation* principle (Cohen et al., 2007, p. 397).

DATA ANALYSIS AND INTERPRETATION

Questionnaire. The 25 statements of the modified version of the MAI were tabulated and scored following the *Metacognitive Awareness Inventory (MAI) Scoring Guide*. According to this model, each statement belongs to one metacognitive facet and one component: a) the facet *knowledge about cognition* included the components *declarative knowledge*, *procedural knowledge*, and *conditional knowledge*; and b) the facet *regulation of cognition*, was constituted by the components *planning*, *information management strategies*, *comprehension monitoring*, *debugging strategies*, and *evaluation*.

Although all statements of the MAI were intended to be answered as *true* or *false*, some students answered *sometimes*. When processing the data obtained from these questionnaires, the students' responses were tabulated thus: *yes* = 1, *no* = 0, and *sometimes* = 0.5. More than offering more detailed results, this tabulation allowed the researcher to identify the number of learners who answered *sometimes*, and to which types of statements.

The tabulation was enriched with colors to indicate the metacognitive component and facet of each statement. Later, the statements were grouped according to the metacognitive component. Subsequently, graphs were plotted to visualize the results of the facets, components, and statements. Finally, after realizing this exercise, the researcher included her observations in the reflective journal.

Interviews. The interviews of the eight fifth-grade teachers were recorded and transcribed to allow for *content analysis* of this qualitative data. In terms of Cohen et al. (2007), the interview transcripts constituted the units of analysis. After reading them carefully, the researcher established the categories and codes to examine their content. Miles and Huberman (1994) argue that "codes should enable the researcher to catch the complexity and comprehensiveness of the data" (as cited in Cohen et al., 2007, p. 481). Subsequently, the researcher went through the transcripts and applied the codes and categories to them to "conduct the coding and categorizing of the data" (Cohen et al., 2007, p. 480). Categories established based on the teacher interviews included *the nature of metacognition, its usefulness, strategies for developing metacognition with students, peer and self-assessment, impact, mistakes as opportunities for growth,* and *challenges and opportunities.* The subsequent triangulation of the codes and categories from the different data inputs allowed the researcher to find frequencies, patterns, and relationships between the "units of the analysis" (Cohen et al., 2007, p. 478), which lead to the comprehension of the outcomes.

Metacognitive strategies classroom implementations. While developing the metacognitive strategies in the classroom, the researcher included her observations in the

reflective journal. She also wrote her annotations after reviewing the outcomes of these activities carried out by fifth-graders. The reflective journal entries were then analyzed according to content analysis as well. Categories that emerged from this analysis included *second language skills, strategies, reflection, assessment, impact, motivation, time,* and *success criteria.* This analysis allowed the researcher to organize and examine the information, and to triangulate these emerging themes with those from the teacher interviews as well as the results from the questionnaire.

RESULTS AND DISCUSSION

The present study sought to explore the metacognitive awareness of fifth-grade learners at Saint George's School. The project also aimed to identify the conceptions and practices of fifth-grade teachers regarding metacognition, and the impact of these approaches on pupils' abilities to recognize and control their knowledge. During their time at the school, the students in this study have experienced metacognitive strategies in different subject areas although teachers do not name strategies explicitly or explain their purpose. As a result, it was found that although students have been exposed to metacognition, the concept was not familiar to them, and students claimed that they did not know the meaning of the term. Students were also unclear about metacognition as an ability to acquire or improve knowledge, or any strategies they might use to cultivate it. Nevertheless, some pupils demonstrated evidence of the capacity to reflect on and regulate their knowledge, to recognize what they know, as well as their intellectual strengths or weaknesses. They also showed some ability to plan, monitor, and evaluate their learning processes. However, again, these competencies were not evident to them, and they lacked the terminology to refer to these aptitudes. Students also demonstrated lower consciousness of their capacity to monitor and command their education. In brief, the students demonstrated higher results in their *knowledge of cognition* than their *regulation of cognition*.

STUDENTS' AWARENESS OF METACOGNITION

One of the objectives of this research was to identify the metacognitive awareness of 11- to 12-year-old learners who had been exposed to metacognition non-explicitly, which means that teachers applied metacognitive strategies in the classroom but did not openly reveal to the students the purpose or terminology of the strategies used. On the adjusted Metacognitive Awareness Inventory (MAI), students exhibited higher scores in their awareness of their *knowledge about cognition* than their *regulation of cognition*. The *knowledge about cognition* facet is constituted by *declarative knowledge*, *procedural knowledge*, and *conditional knowledge*. *Declarative knowledge* refers to "the factual knowledge the learner needs before being able to process or use critical thinking related to the topic" (Schraw and Dennison, 1994, as cited in Knaack & Robertson, n.d.); it is the recognition of one's

intellectual strengths and learning abilities. *Procedural knowledge* is the employment of one's learning for accomplishing a task. *Conditional knowledge* denotes the decisions to use one's knowledge under specific circumstances.

The *regulation of cognition* facet is composed of *planning*, *information management strategies*, *comprehension monitoring*, *debugging strategies*, and *evaluation*. *Planning* signifies establishing aims and selecting means before the study of a subject. *Information management strategies* are the procedures employed to process data with higher efficiency. *Comprehension monitoring* is the action of appraising both learning and the application of studying techniques. *Debugging strategies* are tactics to improve understanding and correct execution failures. *Evaluation* indicates the examination of achievements and helpfulness of tactics following a training experience.

According to the results of the MAI, the facet *knowledge about cognition* presents a higher awareness among fifth-graders, with 78% of the students reporting that they apply the actions associated with this aspect. Conversely, 58% of the students replied as true to the use of strategies linked to the *regulation of cognition* facet, as illustrated in Figure 1. The outcomes of each facet resulted from averaging the scores of the components that conformed them.

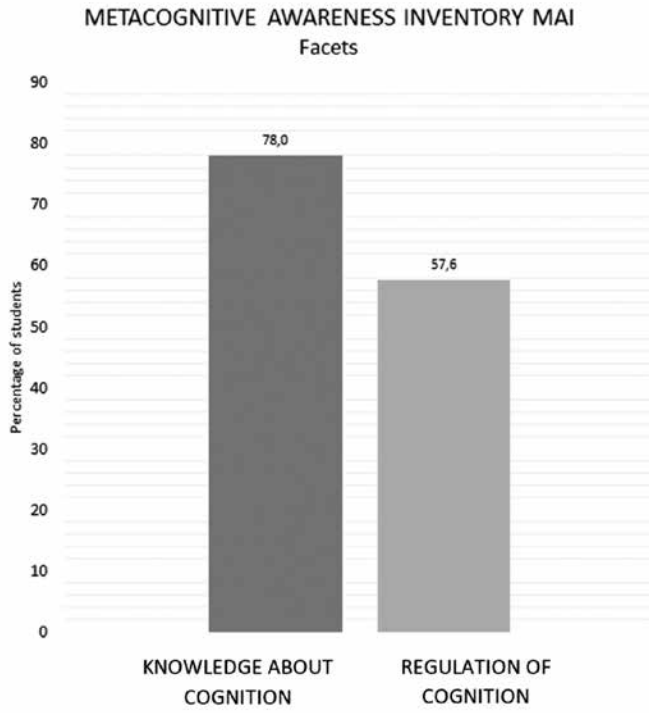

Figure 1. Metacognitive Awareness Inventory outcomes for each facet

These results indicate that fifth-grade students might need more opportunities to strengthen their metacognitive abilities, especially those related to their capacity to monitor and control their learning processes.

Knowledge of cognition vs. Regulation of cognition. Looking more closely at the MAI results of the components of each of the two main facets, the three components of the *knowledge about cognition* facet presented the highest percentage of students considering them as true in their behaviors. On the other hand, the components belonging to the *regulation of cognition* facet presented lower awareness. Regarding the *knowledge about cognition* facet, the average outcomes of the *procedural knowledge* component were the highest, with 83% of the students answering true to the statements related to it. Seventy-seven percent affirmed that they apply the routines related to the *conditional knowledge* component and 74% reported the use of *declarative knowledge*.

Concerning the *regulation of cognition* facet, 69% of the pupils acknowledged applying *debugging strategies*. The use of *planning* and *information management strategies* was recognized by 60% and 59% of the learners, respectively. Fifty-two percent of the students reported practicing *comprehension monitoring*, and 48% applying *evaluation* tactics.

The statements affirmed as true by more than 80% of the pupils belong to the *knowledge and cognition* facet. These statements include the following:

- *I learn more when I am interested in the topic.*
- *I try to use strategies that have worked in the past.*
- *I understand my intellectual strengths and weaknesses.*
- *I am aware of what strategies I use when I study.*
- *I learn best when I know something about the topic.*

In contrast, the statements that obtained results lower than 50% of the pupils reporting them as true belong to the regulation of cognition facet. This outcome denotes that these routines are not commonly applied by fifth-graders at Saint George's School. These statements include the following:

- *I summarize what I've learned after I finish.*
- *I think about what I am going to learn before I begin a task.*
- *I draw pictures or diagrams to help me understand while learning.*

These outcomes indicate that students were familiar with some aspects of the *knowledge of cognition* component. Most recognized their interest in a topic as a cause of better learning outcomes. Many reported being aware of the strategies they use while studying and identified those that worked successfully for them in the past. Numerous pupils asserted that they can recognize their strengths and weaknesses. Various pupils

acknowledged the importance of accessing prior knowledge. It can be inferred that the *knowledge of cognition* aspects of metacognition may have been modeled and implemented with more emphasis by their instructors.

In contrast, the procedures that belong to the *regulation of cognition* facet were less familiar to pupils and they reported only occasional use. These findings of the inventory illustrate which metacognitive routines might be strengthened with these students. Instructors may wish to implement these techniques more explicitly with learners. Asking students to make summaries of what has been learned, reflecting on what is to be learned, and visualizing what has been studied (using tools such as drawings or diagrams) are examples of metacognitive procedures that teachers could apply with their students.

Self-qualification of statements. An interesting occurrence when applying the MAI was that, although the original questionnaire considered *true* and *false* as the only possible replies, 14% of the pupils qualified their answers as *true sometimes*. This suggests that students recognize the approaches mentioned, but they only use them occasionally, possibly because they choose when to apply them or because they are not familiar with them. This suggests that it is fundamental to work explicitly on metacognitive techniques with pupils, which would allow learners to apply them with certainty and benefit as a result.

Students' qualifying of their answers can be considered as an invitation to include *true sometimes* as a possible option in a future application of the MAI. In this manner, more pupils might choose this option as their answer, and consequently, this might provide more detailed information about learners' metacognitive behaviors. It is important to take into account that the MAI is a self-evaluation tool in which students distinguish which of the mentioned practices they truly use.

TEACHERS' PERCEPTIONS AND STRATEGIES ABOUT TEACHING METACOGNITION

Eight fifth-grade teachers from different academic subjects (English, Spanish, French, mathematics, science, social studies, religion, and life values) were interviewed to explore their concepts about metacognition and the procedures they employ to implement strategies to teach metacognition in the classroom. All interviewees expressed clear notions regarding metacognition and its characteristics. In general, they recognize the value of encouraging this ability in pupils. Teachers described the importance of metacognition to encourage students to stand in the center of their learning process, become the actors, and in this way, engage responsibly for their education, reaching autonomy and more meaningful learning. Instructors mentioned that when developing metacognitive abilities, pupils can recognize their strengths and weaknesses, and can find the means to improve.

Instructors also reported using a wide variety of metacognitive strategies in the classroom. Although most of the techniques can be framed within notions and characteristics of metacognition, a few might not be considered clear metacognitive practices. One of the

most significant challenges teachers mentioned was the lack of time to develop metacognition in the classroom. The following results show the recurring ideas from teachers.

Notions of metacognition. Teachers were asked to define metacognition in order to identify their beliefs and understanding of the concept. The answers denote clear notions about metacognition and its features. When defining metacognition, most teachers pointed to its usefulness for learners. Instructors also mentioned how metacognition may assist teachers in identifying teaching strategies that work best, and as a result, improve their work.

In general terms, all of the instructors interviewed provided accurate descriptions of metacognition, its purpose and characteristics. They defined it as a permanent and dynamic cycle, an ability that goes beyond theoretical knowledge and that leads students to better understand human issues, which they see as the ultimate aim of education. One of the interviewees explained the three stages of metacognition: planning, monitoring, and evaluation. This individual identified these as steps that allow students to understand their strengths and weaknesses, the origins of their mistakes, and as a result, aid their own progress.

Metacognition was also described as a method that is useful for teachers and students to gain knowledge. To achieve this, one interviewee argued that metacognitive procedures must be linked to other teaching and learning strategies. Based on the idea that metacognition is not innate to pupils, some instructors mentioned the need to make this explicit in order for learners to understand its value. This could be done through openly explaining and modeling metacognitive techniques to students.

All teachers recognized metacognition as a positive process of reflecting on one's learning. By doing this, pupils realize what they know and do not know. They also become aware of what they learn, how they learn, and how they can improve their education. As stated by one instructor:

> *Metacognition refers to a process, and to the use of strategies, by which a student becomes aware not only of what he [sic] is learning, but also of how he can develop skills to improve the learning process. Through metacognition, a student might also reflect on his failures so he can take advantage of them to optimize his education.*[1]

Teachers also mentioned how metacognition supports pupils as they search for the utility and applicability of knowledge, and consequently, to reach meaningful learning. In brief, instructors described how metacognition leads to autonomous learners who can enhance their strengths and cope with their weaknesses.

One less precise conception was offered by one interviewee: metacognition as a way for students to grasp knowledge and be able to elaborate and reproduce it in their own

[1] All excerpts from the data translated by the author.

words. In fact, metacognition goes beyond reproducing information and aims towards reflection on the learning experience. This misconception might denote that there may still be some misunderstanding among teachers regarding metacognition and its characteristics.

The usefulness of metacognition. Instructors were asked if they considered metacognition useful and why. All the interviewees recognized its value and explained what they thought students might achieve through the development of metacognitive strategies. One teacher explained that metacognition is useful because "from an early age, children are able to recognize their weaknesses and their strengths. This allows them to improve their education regardless of their age."

Teachers highlighted several benefits of metacognition and explained that when students work consciously on things that are difficult for them, they consequently gain cognition in a more meaningful way. Further, they argued that metacognition lets students achieve established goals and learning objectives, and improves pupils' comprehension of how they think, what and how they learn, and the purpose and utility of the subject matter. Accordingly, they become autonomous learners who appreciate the usefulness and applicability of their knowledge.

Teachers further argued that metacognition makes students the actors in the classroom and allows them to realize that knowledge is constructed collectively rather than just coming from the teacher. In this way, teachers highlighted the power for students to achieve learning and gain understanding by themselves. They pointed out that by using metacognitive strategies, students might verify if their study methods are appropriate and if they can transfer techniques to different subjects. In this way, learners can monitor and evaluate the effectiveness of their practices in order to identify appropriate adjustments for improving them. They affirm that metacognition involves students in their education, beyond what a teacher says, the scores they obtain, or others' opinions. They described how metacognition also assists students in building more solid arguments when participating in discussions and encourages students to be more independent and to find solutions to problems. Through metacognition, students can build objective criteria for appraising their own and their peers' work.

Another instructor pointed out that metacognition moves beyond the accumulation of content. It allows students to relate what they learn with their lives, turning content into more meaningful and long-lasting knowledge. When a student realizes that education is useful for something, he or she is eager to search, learn, and apply this knowledge effectively. Some teachers associate the employment of knowledge with the generation of meaningful learning.

The interviews revealed a few less accurate conceptions regarding the usefulness of metacognition. One teacher mentioned that metacognition presupposes collaborative work, which produces active learning. This is not necessarily true because metacognitive processes can be developed both individually and in collaboration with others. Another instructor asserted that metacognition is useful because pupils can share what they have learned with others, so they can also learn from that. This conception is also inaccurate

because sharing knowledge with others is not always a metacognitive process; it would depend on the methods that are used for sharing the concepts.

Strategies to implement metacognition in the classroom. Instructors were asked about the procedures they use to stimulate metacognition in pupils. All instructors interviewed affirmed that they had applied metacognitive strategies in the classroom in a range of ways. In total, the teachers reported 26 different strategies or activities. Many of these techniques can be framed within a metacognitive approach, but others are not easily related to metacognition. Some strategies were extensively defined, and others were just mentioned. It was possible to perceive that teachers do not possess a common language to refer to metacognition or describe their practices.

In order to examine teachers' stated practices using metacognitive strategies in the classroom, the teacher-researcher organized these according to the *Metacognitive Awareness Inventory (MAI)* facets and components. This cross-referencing revealed that 31% of the strategies teachers described correspond to the facet *Knowledge about cognition*, and 23% to *Regulation of cognition*. However, 46% of the strategies interviewees described do not fit clearly within metacognition. Specifically, instructors referred to many teaching-learning strategies that might potentially develop metacognitive competences, but only if the processes of planning, monitoring, or evaluating are considered. For example, teachers mentioned techniques for developing motivation but not necessarily metacognition.

Knowledge about cognition strategies. On the MAI, *Knowledge about cognition* comprises the components of *Declarative knowledge, Procedural knowledge, and Conditional knowledge*. Eight of the strategies (31%) teachers described corresponded to the *Knowledge about cognition* facet, and all of these fit in the *Declarative knowledge* component, which means that teachers encourage students to recognize *what* they know, or as defined by Schraw and Dennison (1994), their "skills, intellectual resources and abilities as learners" (as cited in Knaack & Robertson, n.d., p. 5). It might be deduced that these are the strategies that instructors are more familiar with.

The strategies described that pursue students' recognition of what they know after a lesson included the following: a) *Before I knew, Now I know…*, in which students use their own words to write what they understood about a particular topic studied; b) *What did I learn today?*, which can be used to close a lesson and encourages students to reflect on the way they learned a topic and its purpose; c) *Traffic-light*, which was explained as a tool that students use to reflect on their progress: *green* denoting full understanding of the topic, *yellow* indicates remaining questions and the student writes these down; and *red* signifies lack of understanding, so the student may have an extra study session; d) *3-2-1*, in which students write three sentences related to what was studied, two questions about the topic, and one metaphor, comparison, conclusion, or reflection; e) *Reciprocal teaching*, which is when one student teaches another peer, was mentioned as a technique that allows students to recognize and share their knowledge; and f) *Think-pair-share*, which as its name implies involves students thinking individually, sharing ideas in pairs, and then sharing with the whole class.

Other procedures reported by the teachers were based on accessing pupils' prior knowledge and making the context of the learning experience clear for them. Teachers echoed the importance of providing students with understandable objectives framed within a *what, why and how* approach. Likewise, they described how giving students a list of the topics, learning objectives, and success criteria allows students to know where they are heading, and to recognize at the end of a lesson what they have learned and what is not clear for them yet.

Regulation of cognition strategies. Comparing teachers' strategies to the MAI categories, 23% (6) of the procedures align with *Regulation of cognition* facet, 11% (3) in the *Comprehension monitoring* component, and 4% (1) in each of the *Planning, Debugging strategies,* and *Evaluation* components. No techniques were mentioned for *Information management strategies*, which refers to "skills and strategy sequences used to process information more efficiently" (Schraw & Dennison, 1994, as cited in Knaack & Robertson, n.d., p. 6).

The *Comprehension monitoring* component is explained by Schraw and Dennison (1994) as "the assessment of one's learning or strategy use" (as cited in Knaack & Robertson, n.d., p. 6). Regarding this component, the teachers mentioned self- and peer-assessment activities, which they exemplified with tasks in which pupils ask their peers about content previously studied. Another instructor illustrated this component by describing an assignment in which learners work in pairs, compare and reflect on their work. In this activity, the teacher asks students about their results, and pupils explain why their answers are correct or incorrect. In this way, pupils are encouraged to think about the reasons that support their answers and procedures.

According to Schraw and Dennison (1994), the *Planning* component refers to establishing goals and assigning resources before the learning experience (as cited in Knaack & Robertson, n.d., p. 6). One teacher commented on class activities in which students are asked to discover the objective of the lesson. This was described as an exercise that helps students understand the purpose of what they are learning, what is it useful for, and when and where to use it.

Regarding the *Debugging strategies* component, which is described by Schraw and Dennison (1994) as procedures to rectify understanding and execution faults (as cited in Knaack & Robertson, n.d., p. 6), one teacher pointed out an activity in which he gave clear guidelines for leading students to reflect on and repair mistakes. The instructor explained that this procedure allowed pupils to look at their results retrospectively.

For the *Evaluation* component, which Schraw and Dennison (1994) define as the "analysis of performance and strategy effectiveness after a learning episode" (as cited in Knaack & Robertson, n.d., p. 6), one teacher described *exam wrappers*, which were also implemented by the teacher-researcher (See Data Collection section). This is a technique that asks students to reflect on their preparation for an evaluation, their experience, the results they expected, and actions that can be taken for future preparation and presentation of evaluations.

Other self- and peer-assessment procedures mentioned by the interviewed teachers include the following:

- Asking questions for guiding formative assessment
- The use of rubrics or checklists for guiding self-assessment
- The use of the success criteria list as a tool by which students can self-evaluate their learning process. With this list, they can establish the steps they require for accomplishing a task. They can identify their progress, difficulties, and failures, so they can establish an action plan. The success criteria list may also guide peer evaluation processes.

Teachers described assessment techniques that focused not only on student performance in relation to outcomes, but also on process. For example, pupils may examine how proactive they were, or if they contributed ideas to teamwork. Students can assess their individual and group advances, while the teacher can evaluate the final and visible result. Group assessment was also mentioned, including the capacity to listen, to work in collaboration with others, and to negotiate. Self- and peer-evaluation make students aware of their own and their peers' actions. They help students to distinguish the peers' behaviors that are positive or not for collaborative work. Besides, these procedures support students in recognizing the facts that make them positive or negative elements for teamwork.

Not intrinsically metacognitive strategies. Although teachers were able to define and describe metacognition, and some of the strategies they carry out do coincide with metacognitive processes, as cross referenced with the MAI, 46% (12) of the procedures mentioned by the interviewees do not align neatly with metacognition because their foremost intention, or essence, is not to develop pupils' metacognitive faculties. Within the techniques described, it is possible to observe three sub-categories: 1) teaching/learning strategies that might potentially facilitate metacognition if students' planning, monitoring, and/or evaluation are incorporated into the task, 2) project-based learning approaches that, even though are valuable for education, are not inherently directed to developing students' metacognitive competences, and 3) tactics directed to develop aptitudes other than metacognition.

The impact of metacognitive strategies on students' practices and awareness. Teachers were asked explicitly what they believed to be the impact of the strategies they implement on student behavior. All teachers affirmed a positive impact although they admitted that they had not assessed this explicitly, pointing to the need for an instrument to measure this. A few teachers linked possible impact to student motivation, claiming that the impact of metacognition "relies on each pupil's interest in learning. There must be intrinsic motivation, otherwise, metacognition will not happen, and the learner will not grasp that knowledge." The interest in reflecting on the learning process, such as analyzing the results of an evaluation, also determines the impact.

Teachers described improvement in knowledge and learning as the main effect of developing metacognition. They mentioned increased autonomy as well, for students to find answers to problems themselves and be less dependent on adult intervention. According to one interviewee, educators must guide students so they "can discover by themselves what is useful for them and, beyond identifying the problem, they can search for solutions without waiting until the teacher or the parent offers a solution." Another benefit that was mentioned was that students may become more conscious and reflective, able to observe and express their doubts and questions. Metacognition teaches them to formulate questions, which initially might not be easy for them.

Other benefits teachers mentioned included receiving feedback although one teacher stated that advancement is more likely to happen in "those students who follow a conscious process and those who understand the purpose of the knowledge they acquire. If pupils do not understand the reasons for their learning, they are less interested in advance in their education."

Other teachers pointed to reflection of learning actions and assessment of outcomes as contributing to students becoming more competent human beings. According to one interviewed instructor, metacognition supports learners in the development of skills that are valuable in the future life because, besides allowing the comprehension of failures, it "allows us to understand issues that we need to face as learners because it promotes the development of skills that are useful in different fields."

One instructor mentioned that metacognition makes students aware of the usefulness of the gained knowledge, which is a motivating experience for them. This way, education becomes meaningful in diverse contexts and subjects. This also allows pupils to transfer their learning to different circumstances. According to her "discovering the purpose of knowledge is motivating for students and makes cognition meaningful for them in different contexts."

Challenges and opportunities for developing metacognition in the classroom. Instructors contributed by mentioning the challenges, difficulties, and opportunities they had noticed for working metacognition in the classroom. The opportunities mentioned refer to the possibility of building teamwork in order to achieve better results in the promotion of metacognitive abilities in pupils. Some teachers pointed out that instructors' actions might be more effective if they were to follow common guidelines and apply analogous metacognitive strategies. They also mentioned that if teachers speak the same language regarding metacognition, and if instructors approach metacognition asking learners similar questions, a greater impact might be produced in terms of students attaining higher awareness. They mentioned that if teachers of different subjects and from different levels follow similar procedures, students' ability to reflect on their work and others' work will increase.

Teachers also stated the importance of revealing explicitly to students the significance of the metacognitive processes, that is, the value of reconsidering one's educational

processes. According to one interviewee, reflecting on one's progression is not an inherent characteristic of students; therefore, the "metacognitive processes should be taught […] and the role of the teacher is to make students aware of the importance of metacognition and the relevance of going back over each one's process."

Regarding the difficulties, interviewees affirmed that managing a large number of students per class is more demanding when implementing metacognitive procedures in the classroom. Still, one of the biggest challenges teachers described was the time required to work metacognitively, given the school's busy schedules. They argued that reflection takes time and metacognitive processes require in-depth tracking from the teacher.

CONCLUSIONS

The purpose of this study was to examine the metacognitive awareness of fifth-grade students at Saint George's School who had been exposed in a non-explicit manner to metacognition by teachers from a variety of academic subjects and grades. Through the execution and subsequent analysis of the *Metacognitive Awareness Inventory* (*MAI*), it was observed that a group of 11- to 12-year-olds at Saint George's School better recognized the use of strategies related to the *knowledge of cognition* facet of metacognition. Pupils showed consciousness of their intellectual capabilities as learners. On the other hand, they revealed lower responsiveness of their capacities to monitor and command their learning processes as they reported less use of the approaches related to the *regulation of cognition* facet of metacognition. Fifth-grade learners at Saint George's School revealed less familiarity with the appraisal of their accomplishments or the effectiveness of the learning techniques they used.

These findings concur with those presented by Veenman et al (2004), and Roebers et al (2009), who refer to the moment when children start to develop their metacognitive aptitudes. Veenman et al (2004) affirm that around 9.5 years of age children begin building their metacognitive abilities. Roebers et al (2009) state that by age 9 children can differentiate correct and incorrect answers, leading them to manage monitoring skills fairly well. Then, they declare, these skills may be improved. This idea concedes with what was observed with the pupils who participated in this study: in the MAI they reported the application of some metacognitive routines while others were still unfamiliar to them.

Additionally, this study intended to observe the metacognitive notions and methodologies of these students' educators. Teachers revealed clear notions concerning metacognition and valued its benefits. They referred to the reflection process as highly important to foster autonomous learners. Further, instructors pointed out that the development of metacognitive skills had improved pupils' engagement, motivation, level of discussion, problem-solving skills, and academic performance. These findings support those of others who stress the benefits of metacognition in learners. Blank (2000) describes how students who were exposed to a metacognitive approach were more engaged in

their education, could participate with deeper reflections, and were able to build greater understanding that lasted longer. Vainikainen et al (2015) report that the development of learning to learn skills with students affects their complex-problem-solving competences.

Further, Cornoldi et al (2015) found that students who developed their metacognitive knowledge improved their problem-solving abilities in the long term. Annevirta and Vauras (2010) asserted that pupils with higher metacognitive knowledge and metacognitive skills improved their performance and cognitive aptitudes and turned into more autonomous apprentices as they assumed their learning more responsibly. Magno (2010) found that critical thinking can be nurtured through the attainment of metacognitive faculties and, accordingly, metacognition and critical thinking amplify the pupils' learning process. Differing from Hargrove (2012), who found that students that were exposed to metacognitive strategies exhibited higher levels of creative thinking in the long term, the instructors as Saint George's School who participated in this study did not report advances in students' creativity as a result of activating their metacognitive capacities.

This study also detected that instructors used a wide range of strategies in the classroom, some of which were closely related to metacognition and others that, although they were genuinely presented as beneficial for improving pupils' aptitudes, were not framed within a metacognitive approach. Some of these not intrinsically metacognitive strategies might potentially turn into metacognition depending on the way in which teachers guide them.

Linked to this, and perhaps most importantly, this research found that teachers of different levels and subjects at Saint George's School do not possess a common language to talk about metacognition. Although instructors have received training on metacognition and have integrated this knowledge into their own beliefs about teaching, they have done this without close guidance. This may be the cause of a lack of shared language as well as the imprecisions that were observed in this study in terms of teachers' understanding and application of metacognition and metacognitive strategies with learners.

It was also observed that both teachers and students were more familiar with procedures that focus on the *knowledge about cognition* facet of metacognition than the *regulation of cognition.* These findings suggest the need for instructors at the school to reinforce the implementation of routines directed towards strengthening students' capacity to assess the effectiveness of the learning methods they apply and adjust them when necessary, this means, to emphasize on the development of pupils' *regulation of cognition* ability.

Furthermore, this research aimed to examine the impact of educators' metacognitive approaches on learners' capacity to reflect on their cognitive process to recognize and regulate it. This study perceived that at Saint George's School, metacognitive strategies have been implemented openly in the classroom but not explicitly to students, which means that teachers from diverse subjects apply metacognitive techniques but do not expose students to the terminology related to metacognition or the aims of the strategies used. This tendency

for non-explicit strategy training resulted in students not possessing precise or accurate vocabulary to speak about metacognition.

The importance of giving students appropriate terminology is supported by Annevirta and Vauras (2010), who argue that children with a higher familiarity with the features and techniques that affect their cognition can control their metacognitive skills more effectively. These authors affirm that the essential mission of an educator is to provide pupils with *verbal support* to visualize their thinking and problem-solving processes. In this way, learners might regulate their *cognitive and motivational performance*. Çalişkan and Sünbül explain how students who are aware of the use of learning strategies enrich their metacognitive knowledge and their use of metacognitive skills. These authors argue that students achieve this ability when they are instructed on how to choose a strategy and put it into practice, analyze the results, and test another approach when better outcomes are desired. De Jager et al (2007) describe how pupils' metacognitive skills expand when they are exposed to metacognitive learning environments where direct instruction and cognitive training take place. These insights support the idea that a clear presentation from teachers including the language and techniques for developing metacognition might be a factor that drives students' awareness and application of their metacognitive abilities.

The development of this research and its findings contained some limitations, as well as insights that might be considered in subsequent studies about the metacognitive awareness of primary students and teachers' practices regarding metacognition. First, it was not possible to conclude from this research if the results of the MAI were influenced by students' age or maturity. This would be important to consider in order to gain a better understanding of the factors affecting 11- to 12-year' olds metacognitive awareness. Further, it was observed that educators at Saint George's School did not possess a clear, effective instrument to appraise the impact and effectiveness of the metacognitive strategies they utilize. The development of such an instrument would be an opportunity in the future for teachers to assess the impact of their teaching practices, and consequently, to guide their efforts to foster metacognition in pupils.

Most importantly, it was clear that teachers and students at the school did not possess vocabulary or a shared language to talk about metacognition. As such, teachers have the opportunity to offer students clear training on this matter. If educators explain the name and purpose of the metacognitive techniques explicitly and model them, students might achieve a better understanding of their metacognitive abilities and will likely use them more successfully. In this way, they might expand their capacity to recognize, regulate and improve their education. Moreover, explicit instruction on metacognition might also provide both students and teachers with a mutual vocabulary to better comprehend metacognition and achieve greater outcomes.

ACTION PLAN

The present study offered findings and conclusions about the current application of metacognition at Saint George's School. This research found that teachers of different subjects have been applying metacognition in the classroom but without explaining explicitly to the pupils the terminology or aims of the metacognitive procedures. The following are actions that might be taken in the future to enhance the impact of the educators' efforts to foster metacognitive abilities in their students.

- Constructing a *metacognitive toolkit* at Saint George's School that will steer teachers' implementation of metacognition. This guide would be a structured framework of tools and procedures for applying metacognition in the classroom. It would allow instructors from different grades and academic subjects to speak the same language and would also contribute to team building and result in a greater impact on pupils. It might also provide the way forward to assess the impact of the use of metacognitive strategies with students.
- With the development of the toolkit, the Educational Coach at the school could then promote its use among instructors. In this way, all teachers at the school would have access to clear guidelines for encouraging metacognitive skills in students.
- This toolkit should include the ways to develop metacognition explicitly with students, which would include helping them understand the terminology, strategies, and benefits. This may improve metacognitive awareness, and as a result, students' capacity to recognize, reflect on, and guide their learning processes.
- With a clearer application of metacognition in the school, the basis would be created to carry out consistent measurement of learners' metacognitive awareness. The MAI could serve as a possible instrument; however, it would be important to continue including the *true-sometimes* option when applying it with students.

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APPENDIX A

METACOGNITIVE AWARENESS INVENTORY (MAI)[2]

Think of yourself as a **learner**. Read each statement carefully. Consider if the statement is true or false as it generally applies to you when you are in the role of a learner (student, attending classes, etc.) Check (✔) True or False as appropriate.

*Piensa en ti como un **aprendiz/estudiante**. Lee cada pregunta y marca Verdadero o Falso según aplique o no en tu rol de aprendiz (estudiante, asistiendo a clase, etc.)*

	True	False
1. I ask myself periodically if I am meeting the learning objectives. *Me pregunto con frecuencia si estoy alcanzando los objetivos de aprendizaje definidos.*		
2. I try to use strategies that have worked in the past. *Uso estrategias que me han servido anteriormente.*		
3. I understand my intellectual strengths and weaknesses. *Conozco mis fortalezas y debilidades para aprender.*		
4. I think about what I am going to learn before I begin a task. *Pienso en lo que voy a aprender antes de comenzar una asignación (trabajo, tarea, evaluación, etc.).*		
5. I know how well I did once I finish a test. *Sé qué tan bien me fue cuando termino una evaluación.*		
6. I know what kind of information is most important to learn. *Reconozco qué tipo de información es la más importante para aprender.*		
7. I am good at organizing information. *Soy bueno organizando información.*		
8. I learn best when I know something about the topic. *Aprendo mejor cuando ya conozco algo del tema.*		
9. I ask myself if there was an easier way to do things after I finish a task. *Me pregunto si hay una manera más fácil de hacer las cosas cuando termino una asignación (trabajo, tarea, evaluación, etc.).*		

[2] Adapted from the *Metacognitive Awareness Inventory (MAI)* and the *Metacognitive Awareness Inventory (MAI) Scoring Guide* created by Schraw and Dennison in 1994 (Schraw, G. & Dennison, R.S. (1994). Assessing metacognitive awareness. Contemporary Educational Psychology, 19, 460-475, as cited in Knaack & Robertson, n.d.).

	True	False
10. I think of several ways to solve a problem and choose the best one. *Antes de resolver un problema pienso en diferentes maneras de hacerlo y escojo la mejor.*		
11. I summarize what I've learned after I finish. *Resumo lo que aprendí cuando termino.*		
12. I ask others for help when I don't understand something. *Pido ayuda cuando no comprendo algo.*		
13. I can motivate myself to learn when I need to. *Puedo motivarme a estudiar cuando lo necesito.*		
14. I am aware of what strategies I use when I study. *Soy consciente de las estrategias que uso cuando estudio.*		
15. I create my own examples to make information more meaningful. *Invento ejemplos de lo que estoy aprendiendo para comprenderlo mejor.*		
16. I know how well I understand something. *Identifico cuánto entiendo de lo que estoy aprendiendo.*		
17. I find myself pausing regularly to check my comprehension. *Hago pausas mientras estudio para comprobar mi nivel de comprensión.*		
18. I draw pictures or diagrams to help me understand while learning. *Hago dibujos o diagramas para entender mejor lo que estoy aprendiendo.*		
19. I try to translate new information into my own words. *Trato de explicar la información nueva con mis propias palabras.*		
20. I change strategies when I fail to understand. *Cambio de estrategia cuando no comprendo algo.*		
21. I read the instructions carefully before I begin a task. *Leo las instrucciones cuidadosamente ante de comenzar una asignación (trabajo, tarea, evaluación, etc.).*		
22. I organize my time to best accomplish my goals. *Organizo mi tiempo para alcanzar mis objetivos de la mejor manera.*		
23. I learn more when I am interested in the topic. *Aprendo más cuando estoy interesado en el tema.*		
24. I focus on overall meaning rather than specifics. *Me enfoco en los conceptos generales más que en los detalles.*		
25. I stop and go back over new information that is not clear. *Me detengo y reviso de nuevo la información que no es clara para mí.*		

Based on: Schraw, G. & Dennison, R.S. (1994). Assessing metacognitive awareness. Contemporary Educational Psychology, 19, 460-475.

CHAPTER 10

USING MINDFUL CLASSROOM STRATEGIES TO IMPROVE BEHAVIOR AND COGNITIVE DEVELOPMENT IN KINDERGARTEN STUDENTS

INÉS ELVIRA ATUESTA DE GREIFF

While most research on teaching approaches and innovations links these interventions to academic outcomes, preliminary inquiry by many teacher-researchers in the Specialist Program at ÚNICA point to student behavior, emotions and social relationships as critical variables of study, not only as they impact academic performance, but also their role in determining classroom climate and overall social and emotional wellbeing. Inés Atuesta noticed that her kindergarten students displayed not only a lack of attention towards academic tasks, but also disruptive and aggressive behavior towards each other. As a proponent of mindfulness, she set out to determine the effect of mindful practices on children's behavior but also on their development in terms of specific cognitive abilities. Her study joins the many others that clearly demonstrate the benefits of mindful practices on individual and group wellbeing, opening new paths when thinking about the goals of learning.

ABSTRACT

The purpose of this study was to identify the ways that mindful strategies in the classroom can be adapted into the traditional educational model in Colombia. The project specifically sought to observe if these practices had an impact on kindergarteners' behavior and emotional skills as well as cognitive development. The teacher-researcher guided learners on mindful practices during a period of five weeks. Data of students' reactions were collected in a reflective journal, and the results of student writing samples were analyzed as well. Students showed a positive change in behavior, based evidence recorded in the journals, and an increase in cognitive development, based on performance on the writing samples.

Key Words: Mindfulness in education, Mindful practices, Cognitive development, Behavior, Self-regulation

RESUMEN

La atención plena se ha considerado crítica en el proceso de aprendizaje. Muchos proponen estrategias conscientes para reducir los problemas de comportamiento en el aula y mejorar el desarrollo cognitivo y los resultados del aprendizaje. El propósito del presente estudio fue identificar las formas en que las estrategias conscientes en el aula podrían adaptarse al modelo educativo tradicional en Colombia. Luego, el proyecto buscó observar si estas prácticas tenían un impacto en el comportamiento y las habilidades emocionales de los estudiantes de Kínder. Una vez que estos resultados demostraron ser positivos, el objetivo principal del proyecto fue descubrir si las prácticas conscientes también podrían mejorar el desarrollo cognitivo de los estudiantes. El maestro guió a los estudiantes en diferentes prácticas conscientes durante un período de cinco semanas. Los datos de las reacciones de los estudiantes se recopilaron en un diario reflexivo y los resultados de una muestra escrita fueron cruciales para el análisis. Los estudiantes mostraron un cambio positivo en los patrones de comportamiento y un aumento en el desarrollo cognitivo.

Palabras clave: Atención plena, Prácticas conscientes, Desarrollo cognitivo, Comportamiento, Auto-regulación

Mindfulness is an ancient term that has now become part of the academic world. Information is moving at a faster pace each day, and with the help of technology, students have the answers to everything at the touch of their hands. Mindfulness represents a grounding tool in the presence of this whirlwind of activity, information and created needs. For teachers, mindfulness is quite useful to help students be present, understand themselves and their feelings, and to self-regulate. These can help very young learners step away from their frustration, move on, and continue to carry on with their day and their learning processes. Mindfulness strategies can be used inside the classroom at any age, but the earlier they start being used the better.

Despite the benefits of mindfulness, personal and social development, and the promotion of wellbeing and happiness are not usually included within education. Karbalaei (2012), however, argues that education cannot limit itself to working only on academics, linked to the traditional content areas, but rather should help students potentialize their personal and social development, and definitely help them increase levels of happiness. Both aspects, academics and social-emotional development, are equally important and answer to educational trends such as Positive Education (Seligman, as cited in Cebolla, García-Campayo & Demarzo, 2014).

Although mindful practices were initially used exclusively in clinical contexts, today they have proven helpful in nonclinical settings, among which the educational context stands out. Mindfulness has shown positive results with teachers in terms of stress reduction, sick leave due to illness, depression, anxiety and burnout. With students mindfulness has been linked to an increase in academic performance and an improvement in self-esteem and interpersonal relationships, even a decrease in anxiety and violence.

After more than 40 years of research, there is scientific evidence of numerous effects that meditation produces in different areas related to education. For instance, Shapiro, Brown and Astin (as cited in Mañas et al., 2014) state that mindfulness has an important effect on students' 1) cognitive and academic performance; 2) mental health and psychological well-being; and 3) integral or holistic development. However, there is a lack of research of this type in Colombian education since mindfulness is a new concept among the educational community in the region. Further, in the experience of this researcher, working as a teacher and seeing increasing levels of stress and anxiety amongst kindergarten students, it became a concern and hence relevant to research on the impact of mindful practices in the classroom on students' behavior, and thus their cognitive abilities and academic outcomes throughout the school year.

At the beginning of the year school year, I started meditating with my students every morning for five minutes since I was having trouble focusing their attention during morning routines. This practice allowed me to observe changes not only on their attention, but also on behavior. This led me to inquire more as to how these changes could eventually lead to improvements with their cognitive skills and achieve greater academic results. For these reasons, it became interesting to design a systematic mindfulness intervention in order to inquire into the effects of these practices with kindergarten-aged children.

LITERATURE REVIEW

Recently, mindfulness has been incorporated into education more and more to create teaching strategies that enhance students' virtues and individual characteristics in classrooms in schools around the globe. Researchers are intrigued by this issue, and are investigating the impact of mindfulness on education and learning. This literature review highlights studies published in the past six years in the United States, Malaysia, South America and Europe.

This review focuses mainly on research in 1) the impact of mindfulness on learning, 2) how mindfulness helps students with emotions and self-regulation, and 3) how mindfulness has an effect on executive function skills. These studies show the importance of contemplating the possibility of using mindfulness within the normal curricula in schools, and thus generating a positive impact on students, school members and school community. In general, most of the studies show positive results from the implementation of mindfulness practices in different age groups and in different subject areas. Mindfulness has also been proven to have effects on compassion, adaptability and resilience. Furthermore, both teachers and students state that mindfulness has been a powerful tool that has helped make classrooms a more serene, secure place for them, safe from harm, to teach and learn.

MINDFULNESS AND LEARNING

Many studies focus on the impact that mindfulness has had on learning, especially in early childhood. These years are a special time in which the brain is beginning to develop and new connections are being made. This is why mindfulness and its research at this age is so popular amongst theorists and educators. Findings of studies with very young children demonstrate the importance of mindful practices inside the classroom.

Nieminen and Sajaniemi (2016) looked at the research of mindful awareness activities and programs or interventions used as routine everyday activities in schools. They found that high quality research of interventions particularly in early childhood is needed in order to demonstrate the benefits and effectiveness of mindful awareness practices. Everyday practices of mindful awareness are very important for students, and teachers who are using mindful practices inside their classrooms are becoming mindfulness experts, teaching mindfully. Similarly, Shapiro, et al. (2014) reviewed empirical evidence that supports the introduction of contemplative practices into childhood education. This evidence demonstrates that the use of contemplative practices cultivates healthy patterns of behavior and brain development that are beneficial through the child's lifetime. Mindfulness and contemplative practices can be especially beneficial in the early years because of the brain's plasticity. These practices also boost self-regulation, discussed later in this review.

Besides influencing behavior, mindfulness can also have an effect on a child's learning outcomes and overall educational development. Capel (2012) examined how mindful classroom practices affect the quality of learning and overall experiences of children in an early childhood education setting. He found that mindful practices in the classroom help better meet the needs of students, hence, improving their learning experiences. Mindfulness helps teachers become more involved in moment to moment activities and increase awareness, enhancing personal development as well as opportunities to meet students' individual needs. Further, when teachers are able to see things from different perspectives, classroom management and duties become less a routine, instead become endless opportunities for growth and development, and for improving the overall quality of the learning process and outcomes. This may eventually improve the quality of curriculum as well.

As a result of successful academic outcomes, students tend to develop self-confidence, bringing benefits to their development especially during adolescence. Rempel (2012) evaluated empirical evidence related to the use of mindfulness-based activities to facilitate enhanced student learning and support students' psychological, physiological and social development. He found that these types of activities have a positive outcome in students' academic performance, psychological well-being, self-esteem and social skills.

Early childhood, in particular, is a crucial age to introduce coping skills since the association between stressors and anxiety is stronger for young children than for adolescents (Twenge, 2000). Erwin and Robinson (2015) wanted to examine the scope and nature of mindfulness and early childhood. They found that the question is not whether mindfulness benefits young children, but instead how mindfulness practices can be valued with a larger educational context. It is not within children's best interest to view mindfulness as a perspective experience, which fixes a problem or enhances abilities, but instead as experiences which are fundamental to our natural state of well-being.

Finally, Gómez and Villamizar (2017) after much research, sought to propose elements that could be used for the implementation of education based on consciousness in the Colombian educational system, and found that mindfulness can be applicable in any educational institution because its objective is for students to know themselves, develop their interpersonal and intrapersonal intelligence, as well as greater cognitive abilities.

MINDFULNESS AND EMOTIONS ON SELF-REGULATION

Various studies focus on the effects of mindfulness on students' self-regulation inside and outside the classroom. Self-regulation involves stress and anxiety reduction, focusing attention and social-emotional behavior. In general, findings show positive outcomes, indicating that mindful practices help students recognize and control their emotions.

Razza, Bergen-Ciao and Raymond (2013) evaluated the effectiveness of a mindfulness-based yoga intervention in promoting self-regulation among preschool children between 3 to 5 years old. Their findings show that mindful yoga can be used to enhance self-regulation by allowing young children to inhibit or control their impulses. In a similar direction, Blanco (2013) was interested in helping young learners control stress through a program of activities based on emotional intelligence. Six and seven year olds were provided with tools for controlling stress. After applying activities and analyzing the results, the research found that children at this age can in fact recognize and identify emotions. They can also recognize how their body feels depending on the emotion. Seventy-nine percent (79%) of the students were able to reach awareness after breathing exercises. This proved that mindful practices can be performed by children and are beneficial for physical and psychological development.

Studies on the link between mindfulness and self-regulation outside the U.S. are few. However, several have been carried out in Colombia that also demonstrate the power of mindfulness and its effects on other issues affecting children, including anxiety. Alajmo and Jimenez (2016) conducted a study in Bogotá, Colombia with students between the ages of 7 and 12. They evaluated the effects of a mindfulness-based program and found that a very high number of the students suffered from anxiety (71%). However, there was a noticeable decrease in anxiety after the intervention and even two months later. This proved that, in fact, mindful practices are useful for decreasing anxiety levels in school contexts.

Mindful techniques help students feel psychologically better, and also improve their learning processes. Santibañez, Badilla, Medina and Jorquera (2018) worked with pre-kindergarten students in Chile to study the implementation of a predesigned respiratory sequence to potentialize behavioral self-regulation. They also found that more than 90% of the students felt an impact and different after the implementation of the techniques. Researchers reported that not only did students feel happier and calmer, but they actually learned more easily.

In addition to helping with anxiety and learning as research has demonstrated, attention is another area in which investigation has taken place. Enoch and Dixon (2017) worked with 40 elementary aged children and found that present moment or mindful therapies, such as acceptance and commitment therapy, have a positive outcome on children's attention.

Two remarkable studies show the relevance between mindfulness and social-emotional behavior. Butzer, Bury, Telles and Khalsa (2016) reviewed and synthesized researched evidence and proposed a theoretical model suggesting that school-based yoga programs may be an effective way to promote social-emotional learning (SEL) and positive student outcomes. At the end, they argued that providing yoga within school curricula is an effective way to help students develop self-regulation, mind-body awareness, and physical fitness, which at the end fosters social-emotional learning competencies and positive student outcomes, such as improved behaviors, mental state, health and performance.

Thierry, Vincent, Bryant, Kinder and Wise (2018) examined the impact of a mindfulness curriculum on prekindergarten students' self-regulation, prosocial behavior and academic skills. They found that there was a significant impact on self-regulation and self-awareness when it came to mindful practices in the classroom. After analyzing the impact of mindful practices on self-regulation and emotional skills, authors found a clear link between emotional skills and executive functions. Further, the study found that once students have control over their emotions, they have a better development in executive functions, including working memory, inhibiting distractors and flexibly focusing attention. While these findings were not part of the initial proposal of the studies, this demonstrates an important link between mindfulness, emotional awareness and executive functions. These were in fact selected as key variables in several studies, as will be discussed in the following section.

MINDFULNESS AND EXECUTIVE FUNCTIONS

Executive function (EF) refers to the attention-regulation skills that make it possible to sustain attention, and keep goals and information in mind. As EF research progresses, scientists, teachers and parents are becoming more aware of the importance of these skills for learning in school settings for all students. In recent years researchers have become aware that mindful practices in the classroom may have an impact on these skills.

Several studies look at the use of mindful curricula in schools and how their implementation has a direct effect on students EF skills. Wood, Roach, Kearney and Zabek (2018) evaluated the effectiveness, acceptability and feasibility of the Mini-mind curriculum for preschoolers ages three to five. Findings showed mostly small to medium effects in favor of the intervention group on indirect measures of EF skills. Another study that used mindful curriculum was conducted by researchers Thierry, Bryant, Nobles and Norris (2016), who evaluated the impact of the Mindup curriculum on prekindergarten students' EF and language skills. Results in this study showed a significant improvement in EF skills, especially in working memory, planning and organizing. There was no difference found in vocabulary skills in prekindergarten although there was a difference in vocabulary and reading skills. Researchers suggest that mindfulness curricula are useful in school settings to enhance EF, with significant academic benefits. This program was created to give children tools to build resilience in the face of increased societal risk of aggression, anxiety, depression and suicide. It teaches them the skills and knowledge to regulate their stress and emotion, form positive relationships, and act with kindness and compassion.

Zelazo, Forston, Masten and Carlson (2018) assessed the impact of an intervention targeting reflection and stress reduction on children's EF skills. Results showed that the intervention was a success in stress reduction methods but did not show any difference in students' EF skills. However, other studies continue to establish links between mindful practices on students EF skills. Flores (2016) compared the relation between relaxation,

attention and academic achievement in children ages four and five during academic activities in Quito, Ecuador. Findings showed that applying relaxation activities increased students' attention periods between 17% and 25%. In the same way, school performance increased as a consequence of the increment of attention periods but not in the same percentage.

METHODOLOGY

CONTEXT

The context for this study was a private international school in Bogotá, Colombia. The school offers the Primary Years Program (PYP) in preschool and primary. The preschool boasts a vibrant environment, and research is valued as a natural force in the learning of young children. The physical, intellectual, emotional and social needs of the children are met, recognizing the meaning and importance of the first years as the foundation for future learning. Although the PYP recognizes the importance of traditional disciplinary areas, it is considered that learning through these in isolation is not enough. It is for this reason, the program proposes six transdisciplinary themes that allow the acquisition of skills and understanding of the world that goes beyond the traditional disciplines from a particular context: *who we are, where we are in time and space, how we express ourselves, how the world works, how we organize ourselves,* and *how we share the planet*.

In terms of mindful practices in the classroom, the school has no formal curriculum for this; however, different teachers who are becoming aware of the importance of mindfulness in education have started to implement classroom practices with successful outcomes, such as improvement both in attention and behavior.

PARTICIPANTS

Participants in this study were 23 kindergarten students, from five to six years old. Since this was an action research study, all the procedures and activities were conducted by the group's main teacher, who was also the researcher in the study or as Cohen, et al. (2007) describe, a *complete observer*. The teacher documented and recorded what happened in the classroom for research purposes but never declared to the students that she was a researcher. Previous consent was sought and obtained from the parents for this research.

DATA COLLECTION INSTRUMENTS

In order to gather the necessary information for this study and to answer the research questions, it was necessary to use various data collection techniques:

Observations. A participant observation took place. According to Cohen, et al. (2007), this type of observation allows the researcher to stay with the participants and record what was happening while taking a role in the situation. The researcher recorded impressions, conversations, observations, comments, behavior, events and activities and the views of the participants in a situation. By being able to stay in the situation, the researcher was able to see how a situation evolved over a period of time, and caught the dynamic and personalities of the participants. This type of observations were done before, during and after the mindful practices took place inside the classroom on a daily basis.

Another type of observation that was done was the ethnographic observation in which the researcher observed and interacted with the study's participants in the classroom. This observation mainly focused on behavior, emotional skills and cognitive development. All the observations were recorded in a reflective journal that assisted the researcher to recall the events of these observations and its participants.

Pre- and post-analysis. With previous explicit granted permission for this purpose from parents and the school for the use of the students' grades, the researcher analyzed students' performance on three different writing samples from three different points of the school year: October, February and May. The writing samples were chosen to analyze because they allowed the researcher to study both cognition and behavior changes in the students, which are the main two lines of this project. Writing samples are a good way to show student improvement since writing makes for better readers and improves comprehension and critical thinking. It was important to know where the students' cognitive abilities and behavior were at the beginning of the school year (October), after some instruction and learning (February), and finally after starting to apply mindful practices in the classroom (May), and examine how behavior and cognition changed over the three periods. This was done to determine if in fact mindful practices had an impact on students' cognition and behavior.

INTERVENTION

Having the full attention of the students is of the utmost importance. The intervention was intended to elaborate on that premise. Based on Cebolla, et al. (2014), applying mindful strategies in school is relevant because it helps counter stress in order to experience life in a more attentive and conscious way. It also helps students receive information in a more serene and relaxed way, which allows them to learn more easily. Finally, mindful strategies help students develop personal and social skills and contribute to a positive school climate.

The lessons implemented during the intervention were chosen mainly because they were introductory and age appropriate for kindergarten students, were clear and easy to perform, allowing students' to participate actively. In addition, these precise practices are the perfect way to introduce students to values and awareness of the impact of their actions on one another and their community. They are considered mindful practices because they promote being present, awareness and responsibility for one's own self.

The intervention was conducted for a period of five weeks. Its practices were carried out on a daily basis during different times of the day. The interventions imparted include being present, meditation (practice and theory), activation, thankfulness and kindness. Table 1 describes these six interventions:

Table 1. Mindful interventions in the classroom

Title	Description	Place and Time
Being present	The teacher started the class by asking the students what they thought it meant to be present. After receiving many interesting answers, they then made a visual aid to help them remember the meaning of the term and pasted it in a visual part of the classroom. The phrase used in the classroom by the teacher for when a student is being disruptive or inattentive is: " (name of the student) are you being present?" - This helps the term to gain force in the classroom and become part of the students' vocabulary.	In the classroom
Meditation (practice)	In the mornings and during transitions the students and the teacher meditate for three to five minutes. Using the meditation bell the teacher asks the students to take a deep breath, close their eyes and listen carefully to the sound of the meditation bell. They cannot open their eyes until the sound of the meditation bell has finished. The third time the teacher asks them to put their hand in their heart so they can feel their heartbeat and once again rings the meditation bell. This way they are being aware of themselves, their breathing, their heartbeat, and become aware of where they are and what they are supposed to be doing. After this the teacher asks them how they are feeling and if they are calmed and relaxed to start the day and the different activities she has ready for them.	Every morning as and during transitions (after snack and lunch)

Meditation (theory)	After the first meditation bell strategy, the teacher discussed meditation with the whole class and asked them why they thought meditation was important. After receiving many interesting answers the class made a visual aid and made the connection between meditation and being present. During the first weeks the visual aid was used and discussed so the term was understood by the students.	In the classroom
Activation	After the meditation bell the teacher practices another meditation strategy which is mountain pose. It helps bring movement in the mornings saying good morning to the sun and the earth. For mountain pose the teacher asks them to stand up putting their two hands together and two feet strong in the ground. This is the moment where she asks 3 to 5 students' what they are thankful for (see thankfulness intervention). Then she asks them to stretch their arms to the side and then up to the sun. With their arms up towards the sun, the teacher asks them to say "Good Morning, Sun" and return to mountain pose. The teacher asks them again to stretch their arms to the side and stretch their arms to the ground and repeat, "Good Morning, Earth," and return to mountain pose. Then they students sit down and the teacher continues with instruction.	Every morning in the classroom.
Thankfulness	The teacher discussed with the students what it meant for them to be grateful and what where they grateful for. They made a thankfulness tree in which students pasted little hands with written down things of what they were grateful for. They linked thankfulness with mountain pose and when they say good morning to the sun and the earth, they say thank you for the things they give them.	In the classroom
Kindness	The teacher discussed what it means for the students to be kind and the different ways they could be kind to one another and to others in the school and in the community. They made a visual aid that helped the students remind what it means to be kind and allowed them to expose to others little acts of kindness that they were doing. Parents were involved as the teacher asked them to write to her when they "caught" their kids being kind whereas it was with them, their brothers or sisters or someone else. Once she knew these stories, the teacher told the rest of the class, wrote the story in a little heart and asked the student "owner" of the story to paste the heart in the kindness bulletin board of the classroom.	In the classroom, every day

DATA ANALYSIS AND INTERPRETATION

Observations. A participant and ethnographic observation took place in the classroom, and everything was recorded by the teacher in the reflective journal. This data and information was then closely analyzed and interpreted for results, especially regarding behavior and attention. In order to derive the categories from the reflective journal, the researcher utilized content analysis. Cohen et al (2007) describe content analysis as a strict and systematic set of procedures for the rigorous analysis, examination and verification of the contents of written data. As explained by Ezzy (in Cohen, et al, 2007), content analysis starts with a sample of texts (the units), defines the units of analysis (e.g. words, sentences), and the categories to be used for analysis, reviews the texts in order to code them and place the content into categories, and then counts and logs the occurrence of words, codes and categories. This is exactly what the researcher did to analyze the reflective journal as shown as follows:

Table 2. Recurrent themes from the reflective journal

Category	Code	Definition	Example
Visual Aids	VAIDS	Illustrative items that students and teachers make together to understand new terms	The teacher and the students made visual aids for *being present, meditation, thankfulness* and *kindness.*
Questions	QTNS	A sentence made to ask for information	The teacher started the class by asking students what they thought it meant to be present. This was to access prior knowledge and know what students knew about the topic.
Attention	ATTN	Notice taken of something or someone	Students are disruptive and don't pay attention, especially during instruction in the mornings.
Confusion	CNSN	Uncertainty about what is happening, intended or required	Students didn't know why they were saying Good Morning to the sun and the earth, nor being thankful to them.
Meditation	MED	The action or practice of meditating	Meditating practices every day continue to help with behavioral and attention issues.

By using this method, the researcher could analyze the information in the reflective journal easily and fluently.

Pre and post analysis of student writing. To analyze the writing samples, the researcher based the analysis on the language rubrics for writing at the school. These rubric states that in composition the students should choose to write as play, or informal situations, for example fill-in a format in a pretend post office, write a menu or wish list with a partner. In terms of handwriting, students are evaluated on posture and should sit correctly at a table, holding a pencil comfortably and correctly. They should also begin to form lower-case letters in the correct direction, starting and finishing in the right place, and they should form capital letters appropriately and digits 0-9. More specifically, the writing sample also included a rubric that needed to be followed for analysis. Students are placed on one of six levels. To facilitate the interpretation, the researcher gave a numerical value to these levels. This way tabulation and graphing was easier.

RESULTS AND DISCUSSION

The results analyzed from the observations and students' writing samples granted support to this study. Major findings were established in terms of behavior. Students started the study being stubborn, conceited, disruptive and envious. After the intervention took place, notable changes in the students' behavior were present. They had a much calmer attitude inside the classroom and out, they became kinder to one another, and began identifying acts of kindness around them. They were thankful for what they had and what their parents provided for them. On the other hand, the writing samples done by the students in three different months of the year (October, February and May) and their analysis show a clear example of the effectiveness mindful practices on cognitive development in kindergarten students.

BEHAVIOR

As mentioned before, in terms of behavior the findings were clearly noticeable. In the beginning of the school year, it was very difficult for the teacher to impart instruction or settle students in after transitions throughout the day. As mindful practices began to take place in the classroom and students began to be aware of what "being present" meant and started to use this vocabulary in their daily routines, they were able to stay focused and synchronized with class development not only in the mornings but throughout the day.

On the other hand, thankfulness and kindness practices allowed students to improve interpersonal relation skills, and at the same time develop behavioral skills by making them aware of how doing good impacts others. These activities measured their behavior not only as individuals, but the impact it had on the community and made them aware of their role inside it. They were able to see "the bigger picture" and how they can actually make a difference. During these specific activities it was interesting to see parent involvement

as they also began to notice changes in their children's behavior and actions at home. This demonstrates that mindfulness practices in the classroom transcends the academic field.

Finally, meditation practices were critical for behavioral issues inside the classroom in terms of reducing anxiety and nerves when assessment took place. Before these practices took place, students presented sweaty hands, crying, and in some extreme cases they presented mental blocking and could not perform. When meditation took place before assessment, students were calmer, presented reduced levels of anxiety and could manage emotions and nerves in a more serene way. It also helped students with routines and adjustments. During transitions students knew where they had to be and what they had to do to begin class and be present. It gave them structure and organization throughout the day.

COGNITIVE DEVELOPMENT

The test used to prove if mindful practices helped improve cognitive development was the students' writing samples. These writing samples were done at three different stages in the academic school year: October, February and May. These days were chosen because in October it is important to know how the students arrive, in February the teacher had imparted some instruction and they had learned numerous items about writing, and finally in May, right before the academic school year ends, but after mindful practices have taken place inside the classroom.

The graphs below show the students' performance on the three writing samples: before and after the intervention took place

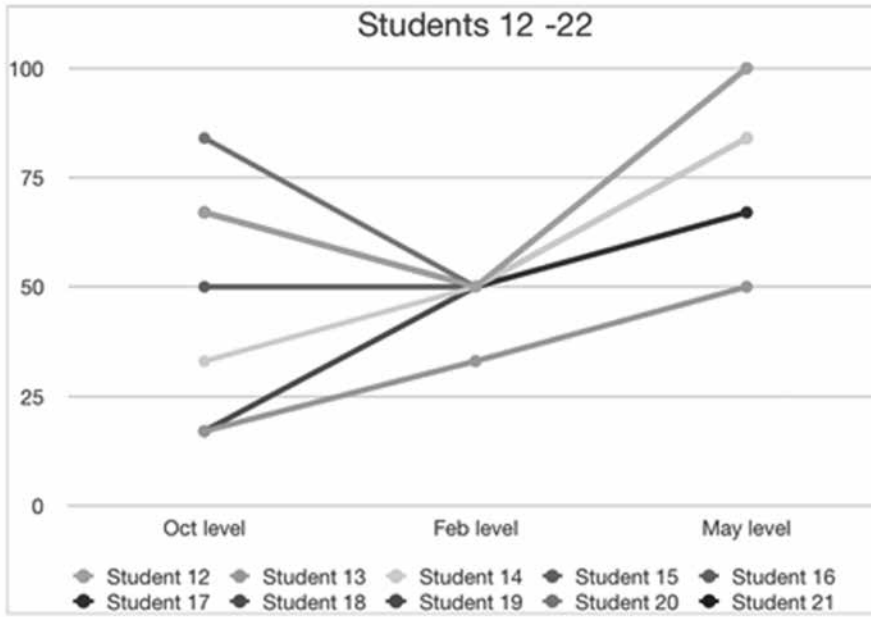

Figure 1. Student writing performance over time (Students 1- 11)

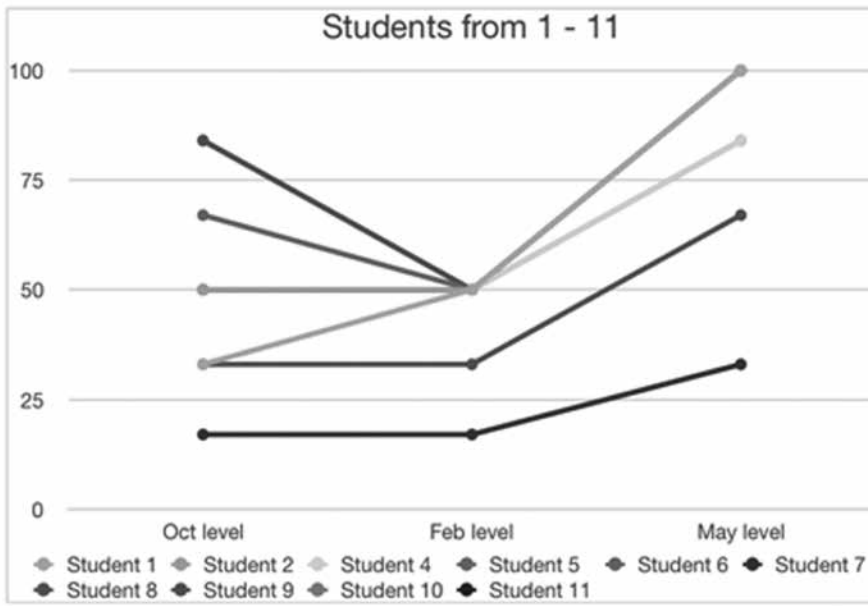

Figure 2. Student writing performance over time (Students 12 - 22)

As it is clear in the graphs there is an improvement between October and May in the students results. This can be attributed both to instruction and mindful practices in the classroom that allowed the students to reduce anxiety levels when doing the writing samples helping them improve their cognitive development and thus show greater academic achievement. The decrease in some students' results between October and February is attributed to higher academic goals versus lower academic results. This situation can present itself due to many things, including academic group level, changes in curriculum, support students, among others.

In conclusion, it is clear that the final results presented in May exceed those from the previous months, this adding the behavior results presented before show an understandable example of how mindful strategies in the classroom are effective both for teaching/learning and personal development for kindergarten students.

CURRICULUM

The study demonstrates how easily mindful practices can fit the traditional educational teaching model. Including these types of practices in the day-by-day curriculum does not take away time for teaching nor planning, yet it has a great impact on the student's behavior and academic results. The first approaches to introducing mindfulness may require more planning and time, but can be done inside the unit planning since it involves subjects that can easily relate to traditional themes taught to this or any particular age group. It all depends on how the teacher can make the proper connections to facilitate the process. As time goes by mindful practices do not take more than five minutes and can be carried out at any given point of the school day, do not require much planning and become so relevant for the students that they start to ask for them.

CONCLUSIONS

The purpose of this study was to identify the ways mindful strategies in the classroom could be adapted into the traditional educational model in Colombia. The project then sought to observe if these practices had an impact on kindergarten students' behavior and emotional skills. Once these results were proven to be positive, the main goal of the project was to discover if mindful practices could enhance students' cognitive development. The main findings after applying mindful strategies were that in fact, they have a great impact on students' behavior inside and out the classroom transcending the academics, into a deeper and more personal field. Results of writing samples also showed how mindfulness has an impact on kindergarten students' cognitive development by allowing them to perform better and learn in a more tranquil and serene way. Finally, the study is proof of how unchallenging mindful practices can fit a traditional curriculum due to the reduced amount of time it takes from actual planning and implementing.

Different research done on the importance of mindfulness shows the impact its practices have on learning. Shapiro, et al. (2014) reviewed empirical evidence that supports the introduction of contemplative practices into childhood education. This evidence demonstrates that in fact, the use of contemplative practices cultivates healthy patterns of behavior and brain development that are beneficial through the child's lifetime. In the same way, the present study showed how students changed their behavior after meditation practices took place, which at the same time allowed them to perform better in testing, in this case the writing samples, and also started to present patterns of behavior that would definitely stay with them throughout their lifetime.

During the first writing samples presented in October, the students presented very high levels of anxiety and frustration. After the mindful practices took place, students were able to control their emotions and perform academically and emotionally better, thus the better results of this sample in May. Rempel (2012) found that mindful activities have a positive outcome in students' academic performance psychological well-being, self-esteem and social skills.

Some limitations of the present study were the lack of grading for the age group that would help in the analysis for cognitive development issues. With more grades from more diverse areas of study from each student, it would be possible to analyze cognitive development more broadly and substantially.

Further research needs to be done in order to identify if the school could develop a mindful curriculum amongst all the preschool levels and apply it in a more consistent way.

ACTION PLAN

Mindfulness has many practices and interventions that can be done inside the classroom and vary depending on the expected result.

- Teachers should implement mindfulness in a consistent way.
- Students should be encouraged to participate as much as possible, as it is for their own benefit.
- Schools should be encouraged to train their teachers in applying mindful practices.
- Schools should inquire for ways to apply mindful practices at every grade level. When these practices are done as a whole, they tend to be more beneficial as everyone is speaking the same language and moving towards one same goal.
- Parent involvement is crucial as mindfulness transcends the classroom into real life everyday situations and can be fed and nurtured at home.

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CHAPTER 11

MINDFULNESS-BASED SOCIAL EMOTIONAL INTERVENTIONS FOR RECOGNITION AND MODIFICATION OF AGGRESSIVE BEHAVIORS IN PRESCHOOLERS

VALERY ALEJANDRA ROJAS ATEHORTÚA

As explored in the previous chapter, mindfulness interventions can be used to positively impact children's behavior as early as preschool. In this study, researcher Alejandra Rojas implemented Davidson's mindfulness curriculum with preschoolers in an ICBF-sponsored community home who routinely displayed aggressive behaviors. The promising results from this study indicate that mindfulness training can sharply decrease the instances of aggressive behaviors as well as improve and develop aspects of social emotional learning. These results make a strong argument for using mindfulness in the early years widely and consistently in schools in Colombia.

ABSTRACT

This study explored how mindfulness-based social and emotional interventions might help preschoolers recognize and modify aggressive behaviors in their everyday interaction. This research took place at the *Semillas de Luz* preschool in Bogota, Colombia, where a total of 21 interventions were delivered to 20 young learners over a period of eight weeks. The group was observed and interviewed to record the number of aggressive behaviors presented as well as researchers' perspectives about aggression before, during and after the interventions. The group was instructed with mindfulness activities, storytelling and hands-on activities proposed by Richard Davidson in the Mindfulness-based Kindness Based Curriculum. Findings indicate that the mindfulness interventions aided in children's recognition and modification of aggressive behaviors, and encouraged the development of social and emotional skills.

Keywords: Mindfulness, Social and emotional learning, Aggressive behavior, Preschool

RESUMEN

El propósito de este estudio fue explorar si las intervenciones sociales y emocionales basadas en la atención plena ayudan a los niños en edad preescolar a reconocer y modificar los comportamientos agresivos en sus interacciones diarias. Esta investigación se llevó a cabo en el jardín infantil Semillas de Luz en Bogotá, Colombia, donde se realizaron un total de 21 intervenciones con un grupo de 20 infantes. El grupo fue observado y entrevistado para registrar el número de comportamientos agresivos presentados y sus perspectivas sobre la agresión antes, durante y después de las intervenciones. Se instruyó al grupo con actividades de atención plena, narración y actividades manuales propuestas por Richard Davidson en el currículo de atención plena basado en la amabilidad. Las intervenciones se llevaron a cabo durante un período de ocho semanas. Los hallazgos indican que las intervenciones de atención plena fueron beneficiosas para el reconocimiento y la modificación de la conducta agresiva de los niños y para la adquisición de habilidades sociales y emocionales en los infantes.

Palabras clave: Atención plena, Aprendizaje social y emocional, Comportamiento agresivo, Preescolar.

A recent shift has occurred in the role of teachers in the classroom from the traditional view of education focused mainly on the acquisition of academic skills, in which teachers' responsibilities were limited to teaching specific subject matter, to a wider view towards student development, including social and emotional skills. Fortunately, there is now a substantial amount of research that supports the importance of guiding social emotional development (SED) and learning (SEL) in educational contexts. Curricular trends have evolved to meet students' SEL needs while educators and researchers continue to develop the ways to teach and develop these skills, including restorative practices, storytelling, empathy, gratitude, group work, and also mindfulness, which is the interest of this action research study. Mindfulness in particular has been used to teach SEL in schools, and research demonstrates that mindfulness practices help learners enhance self-regulation and peaceful resolution of conflicts within the classroom.

In this regard, the present study aimed to apply mindfulness-based social and emotional interventions in a preschool context where behavior problems occurred regularly, and relationships between students were aggressive. Specifically, this project was carried out in the *Semillas de Luz* pre-school located in the south of Bogotá. Teachers at the school had identified aggression as the most common problem in preschoolers. In diagnostic inquiry prior to the intervention in this study, teachers asserted that children from different ages exhibited aggression as a reaction to classmates' attacks, which occurred much of the time. Even though teachers had applied some strategies, the aggressive behavior continued. For this reason, it became important to prioritize the time and type of activities devoted to handling situations of aggression when they happen. Mindfulness-based social and emotional interventions have not been used in this kindergarten, but due to their characteristics and components it was thought that such practices might help children recognize and modify aggressive behavior. The study also sought to identify if mindfulness-based social and emotional interventions were appropriate for preschoolers, and whether they might serve as a reference for teachers and researchers.

LITERATURE REVIEW

This review covers research related to the benefits of social emotional learning, as well as mindfulness interventions, particularly in cases of aggression. In general, the literature indicates clear benefits of SEL and mindfulness in classrooms, particularly as a way to address aggression in young learners.

BENEFITS OF SOCIAL AND EMOTIONAL LEARNING

Even though research on SEL began in the late 1960s, the ideas were present in ancient Greece when Plato wrote about education. Plato claimed that education systems

should have a holistic curriculum in which there should be a balance between intellectual, social, emotional and physical development. Students' holistic development has been and continues to be one of the goals of education, and during the last centuries teachers have become more conscious of its importance. As a result, research on SEL has increased substantially, in different fields and contexts. In general, there is a strong case for the benefits of SEL interventions in schools.

Taylor, Oberle and Durlak (2017)'s meta-analysis is a key source of findings on SEL interventions, focusing on follow-up effects from 82 different social and emotional interventions, involving more than 97,000 students from kindergarten to high school (including control groups), inside and outside the US. The effects of the interventions were assessed six months and up to 18 years after the interventions ended. Results show that students who received SEL interventions, compared to control groups, exhibit a decrease in behavior problems, emotional distress, and drug abuse. Such interventions were also found to promote greater social and emotional competencies, prosocial behavior, and prosocial attitudes. Findings in the meta-analysis suggest that SEL has both short and long-term benefits for students. The short-term benefits are reflected in the positive changes in classroom dynamics, relationships between students, their peers, and teachers. Long-term effects are reflected not only in students' personal development but also in students' broader engagement with society after formal schooling ends.

RESEARCH ON MINDFULNESS

In addition to research on SEL, there is a growing body of research on mindfulness and its benefits, mainly in medical and educational contexts. In medical settings, mindfulness interventions have been applied to reduce stress and control mental problems and clinical disorders such as anxiety, depression or addiction. In education, mindfulness has provided an alternative for improving academic skills and promoting prosocial behaviors among students. In a review of research, Shapiro, Brown, and Astin (2008) the effects of interventions with mindfulness meditation on cognitive and academic performance, on mental health and psychological well-being, and on the development of the whole person. For the purpose of the present study, the review focuses on the last.

Mindfulness meditation has demonstrated to be effective in the cultivation of empathy, positive social relationships, and compassion for self and others (Walsh & Shapiro, 2006). Consequently, educators are now including mindfulness training in their regular teaching practices to guide students in the development of their self-knowledge and awareness. Research in this domain is relatively new compared to other areas, but it promises notable benefits for students' holistic development.

Schonert-Reichl and Stewart (2010) studied the effects of a mindfulness-based education program on adolescents' well-being and social competence, showing significant improvement in students' social behaviors and self-concept. Six teachers in this study

received training in the Mindfulness Education program (ME). A total of 246 students were involved in the project, 107 students in a control group and 139 receiving the ME program. Before and after the interventions, students assessed themselves in aspects such as optimism, and positive and negative emotions. Teachers also assessed students in their social and emotional competencies. Results show that students exposed to the ME program significantly increased in optimism, positive affect, social and emotional competencies, leading to an improvement in positive school behaviors and decrease in and aggressive behaviors. Overall, the results of this study provide consistent evidence that mindfulness interventions foster students' social and emotional learning.

So far, all of the studies mentioned above have been implemented with adolescents or adults, but none with children. Stewart (2006) argues that mindfulness research with children and youth is at a very early stage and further research is needed to understand how mindfulness can be developed with a younger population. In research on the effects of mindfulness practices in the well-being of children, Flook, Goldberg, Pinger, and Davidson (2014) investigated the effects of 12-week mindfulness interventions in 68 preschool children. Participants were randomly assigned to the mindfulness interventions and the control group. The interventions lasted 12 weeks with two 20 –30 minute sessions per week. Children were assessed before and after the training period. Results show that students who participated in the mindfulness interventions improved in their social competencies as reported by the teachers, compared to the control group. Also, a comparison made at the end of the year about children's willingness to share (objects or resources) with others reported that children in the control group acted more selfishly than those in the mindfulness intervention group.

Mindfulness and aggression. In order to know how mindfulness-based interventions may help children to recognize and modify their aggressive behaviors in the context of the present study, this review searched for and identified research about childhood aggression specifically in the Colombian context. One study shares the experience in Villavicencio (Páez, 2006) with the objective of discovering what factors generated aggressive behaviors in children. The findings suggest that children's aggression is related to their manifestations of unconformity toward family problems. Most of the research on childhood aggression studies the causes and possible consequences of this problem. However, there are not enough studies that report the application of strategies to help children to control aggressive behavior.

The ICBF[1] developed a project (Torres, 2009) featuring guidelines for teachers with conceptual and methodological elements to prevent aggressive situations in the classroom for children aged four to six. Nevertheless, the results of the project have not yet been shared. Research indicates that there is a gap in regards to aggression in children and how to prevent it. Regarding the effects of mindfulness interventions in overaggressive behaviors, there is also little literature. According to Llorente (2016), when searching databases using

[1] *Instituto Colombiano de Bienestar Familiar* (Colombian Family Welfare Institute)

the terms *mindfulness* and *aggression* together, there are few results, and most of them are carried out in clinical settings.

Singh, et al. (2007) attempted to explore the relationship between mindfulness and aggression by working with children who presented developmental disabilities and aggressive behaviors. In this project, four such children also with limited social skills participated in the study, with their parents. The parents received training in mindfulness and also practiced it. After the training, it was demonstrated that parents could mindfully attend the challenging behaviors of their children. Parents improved their social interactions with children and lowered parenting stress. Parents also reported that they were able to help their children to reduce aggressive behaviors and increase social skills. In addition, children showed positive improvement in their interactions with siblings. As reported by this study, mindfulness seems to have an influence on children's aggressive behaviors.

METHODOLOGY

CONTEXT AND PARTICIPANTS

This project was conducted at the *Semillas de Luz* preschool, located in the locality of Bosa, in the south of Bogotá. The population of the study included 20 preschoolers aged four to five years old. Written permission was delivered to the students' parents and teachers to inform them about the purpose and procedures of the study and to obtain their consent for preschoolers to participate in all the research stages.

Semillas de Luz is a public preschool that works under the supervision of the ICBF, which aims to provide protection and guidance to children, parents, and educators in charge of infants. The biggest program in the ICBF institute is the Community Homes,[2] which are preschools that work with children between 18 months and five years old. The main characteristic of this service is that it is run by Community Mothers,[3] who run the preschools out of their homes and take care of 13 to 15 children. *Semillas de Luz* is a group home[4] that assists 70 children every day. Children are divided into five groups according to their age.

Participants in this research were selected on the basis of informal talks with the teachers at the first stages of the project, which suggested that this group presented a high frequency of aggressive behaviors compared to other groups. The subsequent interviews and observations helped to confirm this information.

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2 In Spanish: *Hogares Comunitarios de Bienestar* (HCB)

3 In Spanish: *Madres Comunitarias*

4 The group home is an association of 5 community homes that work in the same place. In Spanish are called *Hogares Agrupados*.

DATA COLLECTION INSTRUMENTS

With the aim of answering the research questions, three different qualitative techniques were used to collect data: observations, focus groups, and interviews.

Observations. Observations were carried out before, during and after the interventions and were recorded in a logbook organized by weeks and lessons. The purpose of the observations varied depending on the research stage: before the intervention to record the frequency of aggressive behaviors presented among the group as well as the reasons for these behaviors, during the intervention to continue recording the frequency of aggressive behaviors along with children's reactions and adaptability to the interventions, and after the interventions to record the frequency of aggressive behaviors and children's interactions during daily activities, specifically focused on whether students had modified aggressive behaviors or not.

The observations before the interventions helped generate categories in terms of the types of aggressive behaviors presented in the group. These categories were then used to create an observation protocol used every week during the intervention to report the number of aggressive behaviors. This protocol included twelve indicators of aggressive behaviors and the researcher marked the indicator each time a behavior was observed (Appendix A). The observation protocol was not only marked by the main researcher; one of the teachers in the kindergarten was also in charge of marking the aggressive behaviors presented during the day when the researcher was not in the kindergarten.

Focus group. Focus groups were carried out with preschoolers before and after the interventions in order to gain insights into the children's views about aggressive behaviors. It also shed light on the reasons why students display aggressive behaviors and how teachers manage this.

Interviews. The interviews were carried out with the group's teacher in order to gain an understanding of her view about aggressive behaviors in the children and whether the interventions helped students to recognize and modify those behaviors. Even though the objective of the research was not to identify the benefits mindfulness-based interventions on teachers, the interviews did provide important data about this as well.

PEDAGOGICAL INTERVENTION

The aim of this project was to explore the impact of mindfulness-based social and emotional interventions on preschoolers' recognition and modification of aggressive behaviors. As such, the interventions considered the research, which demonstrates the effectiveness of mindfulness practices when assisting students and teachers in managing difficult emotions, improving self-regulation, social competencies and relationships with

others. Furthermore, the practices of mindfulness were expected to reduce the levels of emotional reactivity and increase levels of calmness in students.

Bearing this in mind, we expected that those aggressive behaviors in children caused by emotional reactivity and anxiety could be reduced with the mindfulness practices. In addition, the curriculum chosen includes mindfulness exercises that are bound to different guiding themes such as emotions management, self-control and problem-solving which the competencies are promoted by the SEL framework. The interventions lasted 13 weeks in order to have enough time to establish a routine with the children and teach them the variety of mindfulness strategies. Besides, as Davidson argues, "Mindfulness practices require consistent repetition and use in daily experiences to become a part of how we interact in our classrooms and world." (2017, p. 8) There were 26 sessions of 50 minutes delivered twice a week. The lessons were planned taking as a reference the Kindness Curriculum (Davidson, 2017), and its materials were adapted to Spanish speakers and four new lessons were included.

Table 1. Intervention units

Unit	Topic
Mindful bodies	Introduction of the term *mindfulness* to students and its components, e.g. attention and breathing.
Emotions on the inside	Noticing sensations, reflecting about feelings in the body, recognizing that both feelings we like as well as feelings we do not like are helpful.
Emotions on the outside	Changes in emotions and how feelings can be reflected in our faces and bodies
Strong emotions on the inside and outside	Ways to manage difficult feelings
Calm and problem solving	Achieving calm through body movements and learning how problems are better solved when we forgive ourselves and others
Gratitude	Recognizing our differences things we are grateful for
Gratitude for people	Demonstrating connections between people and how society is interconnected and everyone depends on someone else, including nature.
Gratitude for the world	Summary of all the topics and reinforcement of strategies to manage strong emotions.

Each lesson was divided into three parts: 1) Connection -- build rapport with students and let them know the topic of the class, 2) Explanation -- use visual representations to

explain the topic in depth, 3) Practice -- invite students to apply what they learned. During the sessions students were encouraged to describe their experiences, sensations, thoughts, and emotions (Appendix B).

DATA ANALYSIS AND INTERPRETATION

The information collected from the observations, interviews and focus group was analyzed in order to categorize the data into the pre-existing categories of *recognition and modification of aggressive behaviors*, and to identify possible new categories. Next, the observations, interviews, and focus groups were analyzed together in order to identify common data that was specifically related to preschoolers' recognition and modification of aggressive behaviors. This analysis provided a more complete insight of the impact of the interventions.

This initial categorization was useful and, interestingly enough, the data collected shed light on other skills that were also being affected by the interventions. Surprisingly, the skills affected by the interventions aligned naturally with some of the components of SEL and resulted in the categories *self-awareness, self-management, social awareness,* and *relationship skills*. Finally, a detailed analysis of each category was made.

RESULTS AND DISCUSSION

After analyzing the data it was possible to identify strong evidence of the positive impact of mindfulness-based social and emotional interventions on in students' recognition and modification of aggressive behaviors as well as the development of social and emotional skills. Furthermore, the data demonstrates the appropriateness of the mindfulness-based interventions for children at this age. To better explain the results of this study three categories are presented; the first one is exploring the suitability of mindfulness interventions for preschoolers; this category addresses to what extent mindfulness interventions are appropriate for preschoolers and how teachers can apply them by developing a scaffolding of the concepts. The second one is building a safe and sound learning environment; this category tackles the students' recognition of their aggressive behaviors and how students awareness about aggression can help them to build healthier relationships and the third one, strengthening powerful connections; this final category intends to highlight the synergy found between the mindfulness practices and the SEL framework.

SUITABILITY OF MINDFULNESS INTERVENTIONS FOR PRESCHOOLERS

One of the objectives of this project was to determine the appropriateness of mindfulness activities for children. The data analysis and interpretation demonstrate that mindfulness interventions are appropriate for preschoolers as long as there is well-developed scaffolding of the concepts. Traditionally, most of the research about mindfulness has been carried out with adults; therefore, the way concepts are explained and developed in mindfulness interventions are framed within their cognitive capacity. If we try to use the same explanations with preschoolers, it might be hard for them to grasp the concepts.

Taking into account the age of our population, we started to explore how to introduce the mindfulness concept to preschoolers and how to scaffold mindfulness practices for them. The curriculum proposed by Davidson (2017) illustrates how mindfulness-based interventions should be delivered with young populations and includes songs, movement, books, and hands-on activities. These activities helped communicate concepts such as mindfulness, kindness and gratitude in ways that preschoolers were able to understand. The data shows that during the interventions students clearly grasped these core concepts, which were often introduced through stories. For example, students read a story in which the main character was kind when he helped his mother who was sick or when he hugged a friend who was sad. Through this exercise preschoolers recognized what an act of kindness is and how they can be kind. These experiences demonstrate that children learn concepts better when they are given clear examples.

In addition to comprehension of concepts related to mindfulness, breathing is an essential aspect of mindfulness and breathing practices in the interventions were intended to guide children to experience their own breathing and be calm and relaxed. At the beginning of the interventions, the observations showed that young learners were very energetic, and it was difficult for them to adopt a calm state. At first, it was assumed that breathing exercises were not suitable for preschoolers. However, by the middle of the interventions this first assumption changed dramatically when it was noticeable that after several days of practice, children were calm and focused on their body sensations. Their perceptions about the breathing exercises were also positive, and children reported that they were fun and relaxing. Indeed, by the end of the interventions it was not necessary for the teacher to lead the breathing exercises since children were able to do them by themselves.

In short, teaching preschoolers mindfulness exercises is possible. The data analysis afforded evidence of how well students grasped the main concepts of the mindfulness practices and most importantly enjoyed the mindfulness exercises. Certainly, data also suggests the clear responsibility of teachers to plan, develop and deliver mindfulness exercises.

BUILDING A SAFE AND SOUND LEARNING ENVIRONMENT

The construction of a positive environment is highly related to the students and teachers' relationships and how they manage to be part of the same system, dealing with similarities and differences peacefully. For this reason, one of the main inquiries of the project was to know to what extent mindfulness-based social and emotional interventions helped children to recognize their aggressive behaviors. Taking into account the data analysis, it can be asserted that by the end of the interventions, students were able to recognize that their aggressive behaviors affect others.

Before the interventions preschoolers were able to recognize that they displayed aggressive behaviors. During the first focus group participants commented, "I fight because they take away my toys"[5] or "I hit my brother with a toy when he hits me too." These reactions are usually the response toward situations that make them feel angry or frustrated. During the interview with the teacher, she argued that some of the children assume that they can fulfill their immediate needs by being aggressive. To illustrate, when children were asked if there were any other alternative to solve a problem with a partner in order to avoid attacking each other, one of them replied, "No, we hit them with a toy." Aggression seemed to be children's natural reaction to the problematic situations they confront every day. Taking this into account, during the mindfulness-based interventions preschoolers were explicitly taught to recognize how their body felt when they were angry or frustrated as well as the situations that made them feel this way.

During the first three weeks of interventions, children were taught breathing exercises that helped them recognize their body sensations. In the logbook it was reported that since the very beginning children were able to express how they were feeling with those exercises. However, when they were asked about their body sensations with feelings such as anger or sadness, they could not answer. During the final weeks of the interventions, children were asked again about their body sensations when they were angry. This time they were able to describe how they felt, for example, "[when I'm angry] I feel like crying and my cheeks turn red," or "I scream when I'm angry."

In regards to the reasons why they felt angry, even before the interventions it was easy for them to describe the situations that made them angry. Children knew they did not like it when a classmate took a toy they were playing with or any other object. Even though children recognized that they attacked each other, they did not know that those aggressive behaviors were affecting their peers. However, by the end of the interventions children showed positive improvement towards the recognition of their own behaviors and how they can affect their classmates. The teacher explained, "Children recognize their emotions; they now respect each other."

[5] Translated from the original Spanish by the author.

Once students started to know themselves better, it was easier for them to recognize that being aggressive was harmful for them and their partners alike. Data also shows that the pace in which children developed awareness about their classmates' feelings was slow, but they attained it. On the other hand, it was expected that once preschoolers were able to recognize their aggressive behaviors, they would also be able to modify those behaviors. Nevertheless, not all preschoolers' aggressive behaviors were modified even though there was a significant reduction.

The observations carried out before the interventions along with the teacher's interview demonstrated that children displayed a significant number of aggressive behaviors in everyday interactions. However, by the end of the interventions, aggressive behaviors decreased significantly. The total number of aggressive behaviors was obtained from the observation protocol. All the points in each item were totaled for each week. The following figure shows the number of aggressive behaviors from Week 1 to Week 14

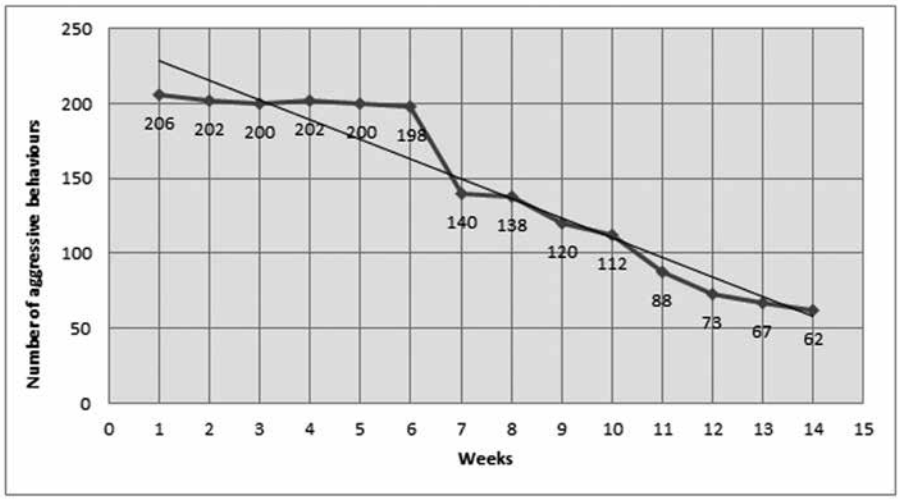

Figure 1. Number of instances of aggressive behaviors per week

As can be seen in Figure 1, during the first week 206 aggressive behaviors were reported, and from Week 2 to Week 6 the number of aggressive behaviors did not vary significantly. However, beginning in Week 7, these behaviors were reduced 33% and by the end of the interventions aggressive behaviors reduced 69%.

The significant reduction of aggressive behaviors beginning in Week 7 can be associated with different factors. First, at that point in the interventions children were used to the dynamics of the exercises and were more engaged with the activities. They thus begin to apply what they learned in the interventions at different moments during the day. To illustrate, in the interview with the teacher she observed, "The children used the exercises

they learned in the mindfulness sessions either with my help or without it. They already knew where to go to solve their problems." Further, in Week 6 children were explicitly taught different alternatives to solve their problems, which were reinforced through a variety of activities including games, stories and visual representations. Afterwards, it was possible to observe children begin to replace aggressive behaviors with the new alternatives they had learned.

From Week 7 to Week 13, aggressive behaviors decreased constantly. The data evidenced that children were able to modify their aggressive behaviors. According to the teacher's perceptions, after the interventions children were able to manage difficult situations in different ways. She reported, "When they play, they tell me when a child is aggressive with others in order for me to give them a solution, but there are sometimes when they are the mediators and already know how to use the tools." Children also reported being aware of the different alternatives to avoid using aggression. They reported, "I quickly tell the teacher, or I can use a pinwheel to calm myself down," or "I play with another toy while she finishes playing and then we change."

Hence, introducing mindfulness-based interventions in very young children in order to help them recognize and modify their aggressive behaviors resulted beneficial for both students and teachers. Children started to consider the possibility of taking more responsibility for their behaviors by noticing how they affect others. Simultaneously, teachers started to realize that there were many ways in which they could build a safe and sound learning environment for preschoolers.

CONNECTIONS BETWEEN MINDFULNESS AND SEL

The process of going from theory to practice and from practice to theory made highly visible the strong relationship between mindfulness and SEL. According to Stewart (2016), SEL and mindfulness share theoretical and empirical principles; their core competencies are interconnected and they strengthen each other simultaneously. For example, mindfulness practices promote emotional regulation through exercises in which children understand how they feel and why. In the same way, SEL promotes the development of self-management skills when students learn to manage their emotions to achieve their goals. In this way, it was possible to determine that mindfulness and SEL share a unique synergy when it comes to enhancing social and emotional skills.

The data analysis shows other categories that were not necessarily related to children's recognition and modification of aggressive behaviors. Data about each item of the observation protocol was analyzed. First, items were grouped according to the different components of SEL associated with the mindfulness pillars Stewart (2016). Next, the number of behaviors presented before, during, and after the interventions were compared. The figure below shows how the items were grouped.

Table 2. Behaviors by SEL components associated with mindfulness (Stewart, 2016)

Area	Item	Description
Self-awareness	1	Anxious, always running, cannot stay calm
	2	Quit activities easily
Self-management	8	Disrespectful to classmates, use profanity
	9	Hit, bite or kick others while playing
	10	Hit others when they are angry
Social awareness	4	Destroy their own things or others' things (materials, toys)
	7	Disobey orders from the teacher
	11	Frequently mistreat smaller classmates
Relationship skills	5	Take objects without permission
	6	Don't share toys
	12	Push others

Based on the groupings in Table 2, under self-awareness, it was possible to group behaviors associated with children being anxious, always running or jumping, cannot stay calm (Item 1), and as well as quitting activities easily (Item 2). Before the interventions, it was observed that children had few quiet moments and were usually jumping and running around. The mindfulness-based interventions led children to explore their body and recognize feelings and emotions. During the breathing exercises, it was possible to observe students begin to be able to calm down. The exercises allowed them to explore how their body felt when they were calm and when they were excited. Asking children about their body sensations at the moment of doing an activity allowed them to understand that their body experiences a range of feelings. Consequently, students recognized that for some activities it was appropriate to have high levels of energy, including running and jumping, also that other activities required being calm and focused. This decline is also supported by the frequency of behaviors presented for Items 1 and 2, as shown in Figure 3.

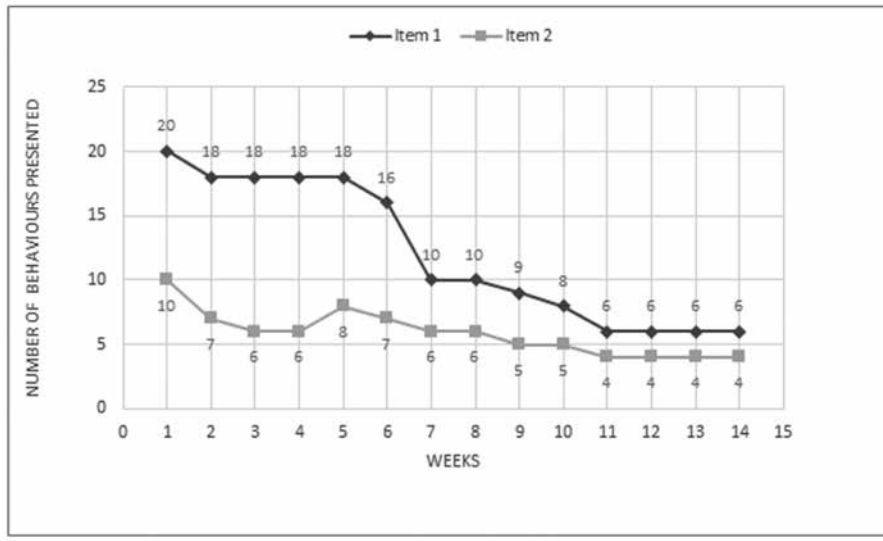

Figure 2. Occurrences of Behaviors, Items 1, 2

As seen in Figure 2, the number of behaviors described in Item 1 (*running, jumping, cannot stay calm*) decreased by 70% by the end of the interventions. Behaviors described in Item 2 (*quit activities easily*) decreased by 60%. Figure 2 also shows that half way through the interventions (Weeks 7 and 8) these behaviors reduced significantly. Behaviors in Item 1 decreased by 50% and those in Item 2 decreased by 40%. This reduction can be linked to the children's adaptability to the interventions; at that point they were already quite autonomous in most of the breathing and attention activities, and it was easy for them to carry them out successfully.

The second area of SEL to which behaviors were ascribed, as proposed in Figure 2, is *self-management*, to which we associated the behaviors involving *being disrespectful to classmates* (Item 8), *using profanity* (Item 9), and *biting or kicking others while playing*. Self-management leads preschoolers to regulate their emotions and foster more reflective responses to difficult situations. Before the interventions, children usually attacked each other when they were angry, and sometimes used profanity with their partners and the teacher. Figure 3 illustrates the number of behaviors for items 8, 9 and 10 over the course of the intervention period.

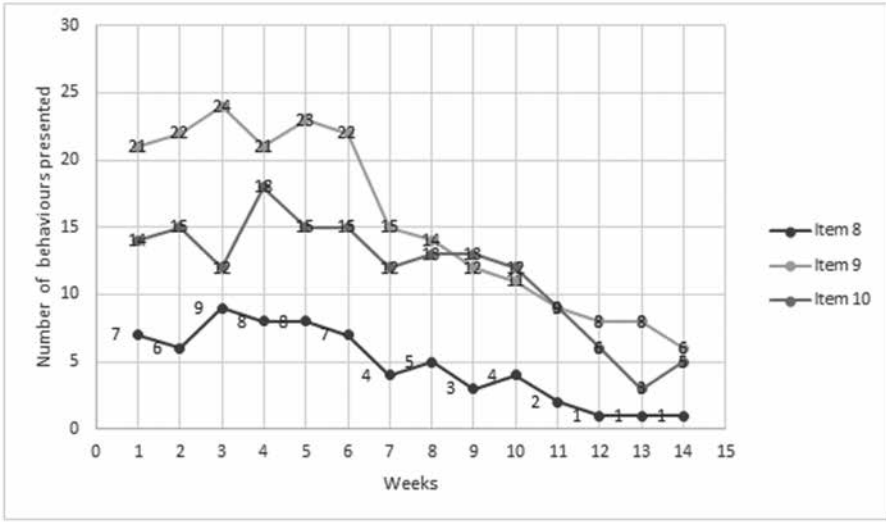

Figure 3. Occurrences of Behaviors Items 8, 9, 10

In Figure 3, it can be observed that these behaviors decreased by the end of the interventions; however this decrease was not constant. Some weeks, the number of aggressive behaviors observed was higher than the previous week. Torres (2009) argues that it takes time for children to modify any behavior. In the case of Figure 3, all items related to a lack of self-management (showing disrespect, hurting with words and physical violence) rose some weeks despite a general decline over the course of the intervention. It is thought that it will take time for children to effectively grasp and become accustomed to the new alternatives to solve their problems.

In spite of an initial variation, as can be seen in Figure 3, aggressive behaviors started to decrease constantly after Week 10. Especially Items 8 and 9 (showing disrespect towards and using profanity with classmates) decreased sharply towards the end of the intervention. It was observed that children were able to recognize and regulate their emotions. In most cases, when students had a disagreement they tried to use the tools from the mindfulness sessions. Participants were positive about this decrease. As the teacher stated in the interview, "They talk now and they didn't do that before when someone took a toy or did something they didn't like. Their answer was hitting, but now they talk with each other and express what is bothering them." Additionally, when children were asked about different ways they can solve problems with their peers, they answered, "When we are angry, we can breathe and then talk," or "We can also use the bell or we can go to the mindfulness corner."

The third component of mindfulness-related SEL is *social awareness,* which was associated with behaviors relating to living in community with others, and included actions such as *destroying property, such as toys or materials* (Item 4), *disobeying the teacher* (Item

7), and *mistreating smaller classmates* (Item 11). Social awareness attempts to help students develop awareness of others' perspectives, empathy and compassion. At the end of the interventions, it was noticeable that children were able to think about others' feelings, which allowed them to change the way they approached their classmates. The teacher reported, "Now they recognize their emotions, they respect each other, and they are kind. Now, they react more with more empathy, and they share more." Older children stopped attacking the little ones and resorted to other alternatives to solve conflicts.

The final area of SEL related strongly to mindfulness includes *relationship skills*. Similar to *social awareness*, it includes behaviors such as *taking objects without permission* (Item 5), or *not sharing toys* (Item 6), as well as *pushing other classmates* (Item 12). Relationship skills are related to the ability to build positive relationships and develop active listening. Interestingly, before the interventions children were not able to listen to each other. Most of the time, they all wanted to talk at the same time. However, the interventions included activities in which children had to wait their turn, listen to others, and share their experiences with classmates. All of these activities helped preschoolers to improve communicative skills particularly. The number of occurrences is shown in Figure 4.

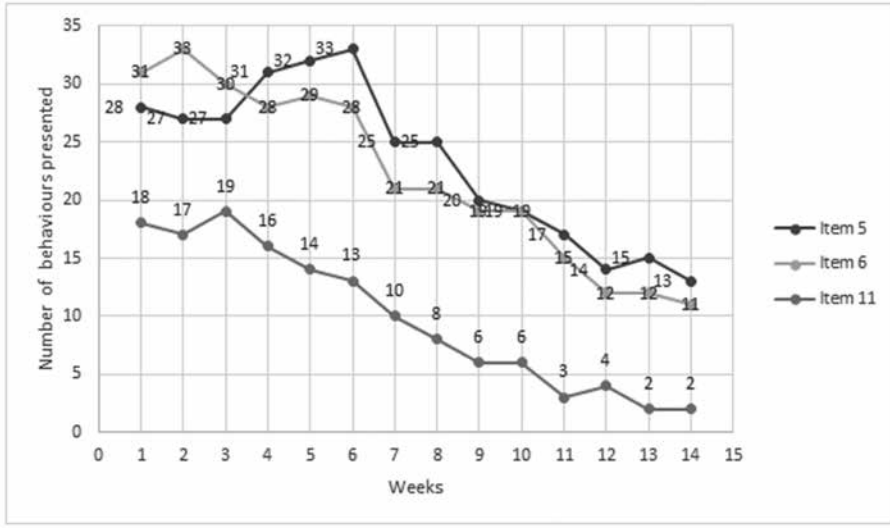

Figure 4. Occurrences of Behaviors, Items 5, 6, 11

As seen in Figure 4, by the end of the interventions the number of behaviors in item 5, 6 and 11 decreased 54%, 65%, and 88% respectively. Even though occurences of these behaviors declined throughout the intervention, at the end it was still quite difficult for preschoolers particularly to share toys and other objects. In terms of their relationship with their peers, there was a significant 88% reduction of students pushing each other, an action they routinely used to solve problems or while playing prior to the intervention. Children

responded less reactively when confronting difficult situations, and this allowed them to improve their relationship skills.

CONCLUSIONS

This research project sought to understand the effects of mindfulness-based interventions on preschoolers' aggressive behaviors. In general, it was concluded that mindfulness-based interventions were beneficial for preschoolers' recognition and modification of aggressive behaviors. Once students started to learn different ways to solve problems, they resorted to the new alternatives instead of attacking each other. Likewise, during their daily routines at the school, children used the tools and strategies from the mindfulness sessions and the total number of aggressive behaviors was reduced by 69% by the end of the interventions. Furthermore, the integration of mindfulness and SEL promoted appropriate conditions for students to develop and reinforce their social and emotional skills.

In line with Taylor, et al. (2017), social and emotional learning has short-term benefits in classroom dynamics and relationships between students. This study evidenced that there were positive changes in the way students interacted with their partners; essentially, their relationships became more friendly and peaceful. The teacher's perception of this modification of aggressive behaviors was also positive. Similar to Schonert-Reichl and Stewart (2010) as well as Flook, et al. (2014), teachers' perceptions evidenced that mindfulness interventions not only fostered students' social and emotional learning, but it also increased the opportunities for students to learn ways to regulate themselves, hence reducing levels of negative reaction.

One of the limitations of the current study was that analyses were conducted at a group level, and aggressive behaviors were counted as a group, not individually. As such, some students displayed more aggressive behaviors than others, and for some it was more difficult to modify their behavior. It is possible that students who showed more difficulty needed more attention and time to start replacing aggressive behaviors for other alternatives. On the other hand, the number of sessions delivered should be more extensive. It was analyzed that even though children managed to reduce their aggressive responses in 26 sessions, it does not guarantee that they will avoid using aggression later on in life. Unquestionably, these interventions gave children solid bases for emotional development; however, if we want these results to be long lasting, it might be necessary to continue reinforcing social and emotional skills. Consistency is a key factor when teaching students SEL skills, which is why mindfulness-based interventions should be at the heart of the teaching practice and should be as important as language, social science or maths.

Even though the current outlook about mindfulness and SEL is encouraging, there are still some areas that require more exploration. As Stewart (2016) explains, mindfulness research with children is in a very early stage and more exploration about mindfulness-

based interventions in youth populations will be needed. Also, it might be important to apply mindfulness and SEL in students from low income homes, and mindfulness school interventions accompanied with parents' support. In addition, future implementations of mindfulness-based programs in the Colombian context are required to better understand how these practices might be aligned with school policies and requirements.

ACTION PLAN

- In-depth exploration of how mindfulness based interventions and social and emotional learning converge. Further research might explore the influence of mindfulness exercises in the acquisition of the skills proposed in the SEL framework.
- Exploration of parents' involvement in preschoolers' acquisition of social and emotional skills through mindfulness interventions. Although it might be challenging considering parents' disposition and time, it is essential to better understand the role of school instruction and home education and how they can work together.
- Research to develop mindfulness and social and emotional curricula for Colombian contexts. Although it might be methodologically challenging, it would be quite useful to understand the types of activities that can be used with Colombian students to promote SEL and mindfulness in the classroom.
- Research and deeper analysis about the current state of mindfulness-based interventions in Colombia and the specific contexts in which they are being applied.
- It would also be interesting to document the perceptions of Colombian teachers in regards to mindfulness-based interventions for their own well-being, personal growth and professional development.

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APPENDIX A

OBSERVATION PROTOCOL

Used to record the number of aggressive behaviors presented before, during and after the interventions

Research Project: Mindfulness in the kindergarten context

Diagnostic: The objective of this format is to serve as support for the observation of aggressive behaviors in children. You will find a list of different expressions, manifestations and reactions that might occur in the preschool context. Every time you observe one of these manifestations please mark with a point on the corresponding day.

Date: _____

Name of the group: _____

Name of the observer: _____

Age of the preschoolers: _____

Observed events associated with aggression	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Total**
anxious, always running or jumping, do not know how to stay calm						
quit activities easily						
seem to be sad, unhappy or overwhelmed						
destroy their own things or others' things (materials, toys)						
take objects without asking						
don't share toys						
disobey orders from the teacher						
are disrespectful to other classmates, use profanity						
hit, bite or kick other children while playing.						
hit others when they are angry						
frequently mistreat smaller classmates						
push classmates						

Is there any other behavior, situation and / or anecdote observed that you would like to share?

_____

_____

_____

APPENDIX B

INTERVENTION LESSON PLAN SAMPLE

Topic: Awareness of attention and breath	**Class:** 1	**Date:** May 7th, 2018
Objective: Students will be able to pay attention to the outside with the help of a bell tone and the inside with the pinwheel exercise.		
Key Vocabulary: attention, breath, inside, outside	**Materials:** bell, pinwheels, flashcards (mindfulness- attention) , images (attention)	
Higher-Order questions: What does paying attention means? / What do you usually do when you pay attention?		

	Connection Stage
Time: (10 mins)	**Introducing the topic** Introduce myself to the children and tell them how many times we will be meeting each other. Then, students will be asked to sit in a circle on the floor and each one is going to say their name. To introduce the topic, I will show students the flashcard with the word *Mindfulness* and I will explain that mindfulness means to pay attention. Then I will ask what does "pay attention" means. After waiting for responses, I will paste the flashcard with the word attention on the board.
	Explanatory Stage
Time: (10 mins)	I will gather all the students' answers in order to clarify that we can pay attention to the inside and the outside of our bodies. Then, I will show them two images of kids paying attention and ask: How can you tell this person is paying attention? After the answers, I will suggest they repeat with me the word mindfulness three times to remember it later.
	Practice Stage
Time: (5 mins)	I will ask students to pay attention to a surprise that I have for them, after showing them the pinwheels I will ask: what do you think I brought? How do you feel about this surprise? When showing the pinwheels I will ask: how does it work? Then I will show them how I have to fill up my belly with air for blowing it out.
	Active Engagement
Time: (15 mins)	Each child will take a pinwheel for practicing their breath. They have to put one hand in their bellies and take a breath until they feel their bellies get bigger and blow the pinwheel. After several attempts students will be asked How they felt when breathing. I will clarify that they can pay attention to the inside when they breathe. Then, I will announce another surprise and again I will ask What do you think I have here? I will put the bell out and explain how the sound of the bell can help them to pay attention to the outside. The bell exercise is about putting the hands in the air and when they listen to the sound of the bell, they put their hands in their belly to feel three breaths.
	Closing Students are asked about the concepts they learned through the images and the teacher will relate the concept of paying attention to the outside with the tone and paying attention to the inside with the pinwheels blowing exercise.

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The present volume of Voices from the Field unfolds discoveries and experiences deriving from studies made by Colombian teacher-researchers who, through a systematic lens, examined several ways to enhance the scope of strategic teaching and learning in the English classroom. Not only have the authors approached these instructional and learning experiences in novel and effective ways, but they have also achieved a deepening of metacognitive, critically-oriented and mindful experiences.

In the present time full of educational challenges, we are to hear the voices from those who have walked such trails, while scaffolding learners to build awareness and find ways to understand and manage their learning actions. This will undoubtedly result in the fostering of more equitable and personalized learning scenarios that assist students to be empowered, improvement-focused, engaged, effective decision makers and lifelong learners.

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