



Learning how to Learn may Help Children Have a Better Self-Perception

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ABSTRACT

The present study aims to investigate the differences in primary school students' perception of teachers' teaching methods, as well as their self-perception, as a result of their participation in a teaching program based on the principles of learning how to learn program. A number of 68 primary school students, aged between 7 and 9, $M = 8.12$, $SD = .47$, of which 38 were boys and 30 were girls, participated in the study. Initially, teachers attended a professional training course to acquire these techniques and strategies. After completing the course, the teachers applied the acquired knowledge with students during three school modules, respectively from January to June 2024. At the beginning and at the end of this period, the students were tested in terms of self-perception but also the extent to which their teachers adopt constructive learning strategies in the classroom (L2L specific). The results showed that teachers' teaching strategies, perceived by the students, improved significantly from the pretest to the posttest, as well as students' self-perception in the areas of school competence, social competence, athletic competence, conduct and self-esteem. Possible relationships between teachers' teaching strategies and approaches to learning on the one hand and students' self-perception on the other were discussed.

Keywords: learning how to learn, self-perception, primary school

1. INTRODUCTION

Self-perception

Self-perception is a psychological construct that reflects the judgment of people about their own abilities to mobilize resources in order to achieve a particular goal. These perceived competencies constitute indicators of the self, especially in childhood, when children make judgments about themselves based on the abilities they believe they possess (Harter, 1988, 2012). Harter (2012) proposes a concept of the self in terms of attributes and characteristics that individuals recognize and verbalize, which change as they mature and experience more successes and failures.

From this perspective, self-perception constitutes an important parameter that helps to understand the development of self-concept in childhood. This self-judgment is a mediator for children's success because when they experience success in the actions they undertake, they tend to perceive themselves as more competent and more motivated to continue and persevere, which generates an uninterrupted cycle of action and engagement with the purpose of improving performance. This circle can strengthen the development of other psychological constructs, such as autonomy, self-confidence or self-esteem. Moreover, a sense of competence enhances children's intrinsic motivation to engage in challenging activities, to persist in schoolwork, and to become good at what they do. On the other hand, when children have negative perceptions of their competence, they tend to avoid challenges and protect themselves from situations that may cause embarrassment by avoiding actions in which they cannot perform (Harter, 1990a,b).

There are a number of factors that determine the development and strengthening of self-perception. Among the external factors are parents, teachers, close friends and colleagues, they contribute to building the self-evaluation mechanism. This mechanism determines the construction of the self-concept and depends on the value and importance that children attribute to external agents. Internal factors include the child's developmental stage, motivational orientations, affective reactions to the results obtained, and persistence in difficult situations. Younger children (2 – 4 years) tend to have less realistic perceptions and often overestimate their abilities. In general, they have insufficient experience to make appropriate judgments and fail to distinguish between what they want to be (idealized self-concept) and what they really are (real self). They base their judgments of their own abilities on their success in

performing certain tasks or on feedback received from adults (Amorose et al., 2005; Weiss & Amorose, 2005).

As children get older, they begin to develop a system of performance criteria that can be used in a variety of circumstances. They begin to prioritize comparison with their peers to enhance self-evaluation and tend to make much more realistic judgments about their performance in different domains (Amorose et al., 2005; Harter, 2012). Children's perceptions are affected by various external variables, and childhood experiences are culturally influenced. Children of the same age may have different cognitive abilities, which affect how they judge their own abilities. For example, there are studies that show that there are gender differences in terms of the perception of competences or age differences (Nobre et al., 2015; Valentini, 2002; Villwock & Valentini, 2007).

Understanding the concept of self-perceived competence and how self-judgment changes in childhood, as well as identifying the factors associated with this concept, is an important step in supporting the healthy development of children. Understanding this construct can guide parents, teachers, or other professionals in developing educational or parenting strategies to help children build an accurate and positive self-image in different areas of life. Educating adults can provide children with learning experiences that enhance children's self-determination and enjoyment of achievement, thereby allowing realistic perceptions of their own competencies.

Around the age of 8-10, children describe their competences based on comparisons of their own abilities with those of others, this mechanism becoming very relevant for self-evaluation. This social comparison that previously served only to adapt behavior now has the purpose of contributing to the construction of self-perception. Thus, the opinions and values of those around (especially significant people) are internalized by the child to a greater or lesser degree, they guide the children's options, the choices they make and the development itself.

External agents, especially peers, provide parameters that are built into the structure of the self-evaluation mechanism, maintained by feedback from these agents about children's performance in certain tasks or experiences (Harter, 2012). This mechanism influences the development of self-concept and depends on the value and importance that children attribute to external agents and the characteristics of the context in which the child actively participates.

Children in the primary school acquire the ability to associate sets of representations and to understand that they

can be good in some areas and less good in others. This age-specific acquisition allows children to make more realistic and possibly more negative judgments about their attributes compared to earlier ages. Because at this age children's abilities develop significantly, they will understand that they can have both positive and negative attributes, thus being able to make more accurate and realistic judgments. Also, the use of social comparison for self-evaluation becomes more mature and implicitly more competent. At the same time, the ability to differentiate between actual and desired self-perception, to understand what people think about them and to put oneself in the place of others also contribute to a clearer self-perception (Harter, 1990, 2012).

Another characteristic of 8-10-year-old children is that they are able to distinguish between the concept of competence (the ability to successfully complete a task) and the concept of effort (the energy required to achieve mastery), to establish relationships between their perceptions and the difficulty of the task and of adjusting one's self-perceptions according to lived experiences (Harter, 1990, 2012).

Self-perception and learning

The self-perception of primary school students develops mainly within the school because school represents the place where most experiences take place, numerous factors such as success or failure intervene, social relationships or social roles are built, all of which influence the formation of self-concept (Galindo-Dominguez, 2019). How students learn, how learning experiences are produced, and teachers' teaching strategies can make a major contribution to the development of students' self-concept. The development of scholastic skills goes hand in hand with the development of self-image, as children become increasingly aware of the success or failure they experience in the classroom (Calsyn & Kenny, 1997).

Student achievement can facilitate the construction of a positive self-perception. In support of this idea, Aunola et al. (2002) showed that first graders with high reading skills report higher self-perceptions, while those with lower reading skills are at risk of developing a negative self-perception. In the same way, students who in primary grades have high school results, also report a higher self-concept. We can assume that the implementation of programs that help children learn how to learn can lead to an increase in their learning performance, but also to a positive self-perception, as children witness their own school progress and actively engage in learning.

The ability to "learn how to learn" is grounded in metacognition, or the understanding and control of one's own

cognitive processes. Studies have shown that when young learners are taught to use strategies like self-questioning, summarizing, and goal setting, they gain confidence in their learning processes and become more effective learners (Paris & Winograd, 1990). These skills are particularly useful in primary education, where students are still developing foundational skills in literacy and numeracy. Teaching students metacognitive strategies early helps build the foundation for skills that will benefit them throughout their academic journey and beyond.

Incorporating metacognitive instruction can also help reduce anxiety around learning, especially in students with learning disabilities or attention disorders. Metacognitive techniques such as self-monitoring, self-questioning, and regulating attention help these students feel more in control and capable of managing their learning, making the overall classroom experience more equitable and inclusive (Torgesen et al., 2001).

Learning how to learn means looking for effective ways to retain information and integrate it into the system of knowledge already held, to persevere in learning and to find the best strategies for organizing knowledge, using personal cognitive abilities to the highest possible level. Every student has the ability to develop and use insights to improve how they approach learning. Learning how to learn is not a fixed trait, but rather a skill that develops and improves over time. By understanding how learning occurs and applying effective learning strategies, the process of acquiring and understanding knowledge becomes easier.

For a student to learn, he must first know how to learn, and then he must build a positive mindset so that he can face the barriers and obstacles encountered and become persistent in learning. It is important that students learn how to learn from the first years of school in order to cope with the increasing demands of schoolwork, but also to learn effectively and acquire the skills, abilities and capabilities needed in personal, school and professional life .

Dr. Terrence Sejnowski (Francis Crick Professor at The Salk Institute for Biological Studies) and dr. Barbara Oakley (University of California, San Diego) suggests that one of the most appropriate methods of effective learning must include the following elements: shifting attention from the diffuse mode to the focused mode, dividing the contents to be learned (chunking), summarizing, recalling and verification.

1. Diffuse and focused mode. During the learning process, students have moments of focused attention and moments of unfocused (diffuse) attention. These moments must

be speculated to the maximum. In both classroom and independent learning, it is advisable that students alternate between the two modes of attention and allocate time for them to take place in accordance with their level of development and the contents to be learned. The most important rule is that the students should be drawn into the focused mode, in which they can actually assimilate information, and then into the diffuse mode to take a break. These breaks must be regular, having the role of "sedimenting" the accumulated information and preventing boredom or fatigue.

2. Chunking. Concepts to be learned must be broken down into smaller concepts so that the knowledge gained builds up like pieces of a puzzle. The student must be informed about the overall picture of the subject being taught and about the modules or chapters of which it is made up.

3. Summarising. In order to fix the information, time should be allocated for extracting the main ideas from the contents taught. Often there is what is called the illusion of learning, more precisely the student's feeling that he has understood and can use the information, but in reality he has very little knowledge in that area. In order for the information to settle deeply, the summarizing process is necessary, during which the key elements of the contents are extracted and possibly noted down.

4. Recalling. It is recommended that students are given time to reflect on what they have learned and recap main ideas. Thus, information will be transferred from short-term memory to long-term memory. Recalling in other contexts can also contribute to deeper learning, thereby transferring the learned concept to another domain and "liberating" it from the context in which it was learned.

5. Testing. It is recommended to check students with mini-tests often enough so that they stay connected with the information and can refresh it, thus solidifying the learning. The purpose of testing or verification is to ensure that the information has been successfully acquired and can be used in the long term.

Based on the principle of switching attention from focused mode to diffuse mode, students benefit from special teaching methods, paying special attention to attention span. First, the teacher immerses the students in the content of the lesson and tries to keep their attention focused by conveying interesting information accompanied by images or videos. As much as possible, external stimuli should be reduced (noises, movements, parallel activities). When the teacher notices that the students' attention is waning, he suggests a break for them

to reflect on what they have learned and to play a game or do a relaxation exercise.

Based on the principle of chunking, the teacher divides the main topics into smaller subtopics and divides them into chunks that are easy for students to approach. At the end of each module, students are asked to provide real-life examples related to the information conveyed in the lesson. Discussions are encouraged, even adversarial ones, the main idea being that students digest the new information and find its applicability in their life context. After the teacher is sure that most of the students are participating in these debates, he will move on to the next module.

Based on the principle of summarizing, after teaching a module, the teacher will ask the students to extract the main ideas, possibly writing them down in notebooks or underlining them with colored pencils. Again there will be discussions between the students and the teacher on the topic of formulating these main ideas. The teacher can propose short games to facilitate the memorization of the main ideas of the lesson or ask the students to compose a rhythmic song in which they use the ideas.

Based on the principle of recalling, the teacher can ask the students to form small groups in which to debate the contents taught, to make drawings that explain these contents, but also their connection with the previous contents of the respective subject. The children can choose a spokesperson for the group, who will present the conclusions they have reached and associate them with the conclusions of the other groups of students. In addition, they can introduce newly learned concepts into other areas of interest, make connections with other disciplines or areas of everyday life.

Based on the principle of verification, the teacher provides feedback to students, possibly asking students to provide feedback to each other based on previously established criteria. Where appropriate, the teacher intervenes to maintain a warm and equal atmosphere where each child is listened to. The techniques and strategies specific to these five principles are applied concurrently, depending on the specifics of the subject, but frequently enough that children acquire learning skills that will be useful to them in the future. In this way, children will learn to think critically, to reflect on what they have learned, to choose what is essential from the lessons taught and to make their learning more efficient. It is possible that through these strategies, students will no longer perceive learning as a tiring act, but as a pleasant and interesting activity that will not only broaden their horizons, but also increase their enjoyment of school. Moreover, by approaching such methods, the feeling of

belonging to the group will be improved, the children being permanently connected within the activities, each of them having roles not only in the act of learning, but also in the act of teaching.

Thus, it is possible for them to understand that they are active participants in the act of teaching-learning, which has the potential to increase their self-confidence and therefore self-perception. They will have the opportunity to demonstrate their skills in a non-conflictual and non-judgmental environment, which is likely to lead to building a positive and healthy self-perception.

The present study

In the present study, teachers implemented a program called L2L to teach children how to learn by adopting a range of techniques and strategies to facilitate learning. Initially, teachers attended a professional training course to acquire these techniques and strategies. After completing the course, the

2. METHOD

Participants

A number of 68 primary school students, aged between 7 and 9, $M = 8.12$, $SD = .47$, of which 38 were boys and 30 were girls, participated in the study. Sampling was a convenience one. Each teacher asked students and parents for their consent to participate in this study, but out of a total of 288 students, only 68 gave their consent (24%). All 288 students benefited from the L2L program, which was implemented during three school modules in several primary classes in three schools. However, participating in the study consisted of completing some questionnaires regarding the teachers' teaching style and the children's self-perception. In the present study, only the responses of students whose parents agreed to complete these questionnaires were analyzed.

Design and procedure

The L2L program took place between January and June 2024. In January, the initial testing of the children took place (pretest), the implementation of the program (teaching based on L2L principles) took place over three school modules (January 8 - February 23, 2024; March 4 – April 26, 2024; May 8 – June 19, 2024), and at the end of June the final test (posttest) took place.

The L2L program aimed to implement some principles to help students learn how to learn, namely: 1. The principle of focused mode and the diffuse mode - the students switch their

teachers applied the acquired knowledge in their classes of students during three school modules, respectively from January to June 2024. At the beginning and at the end of this period, the students were tested in terms of self-perception but also the extent to which their teachers adopt constructive learning strategies in the classroom (L2L specific).

Taking into account the links between learning and self-perception, we aim to verify whether after the implementation of the L2L program students notice an improvement in teachers' practices regarding teaching according to L2L principles, but also whether significant changes have occurred in students' self-perception. The following hypotheses were thus established:

H1. *Students' perception of teachers' teaching methods will improve after their participation in the L2L program.*

H2. *Students' self-perception will improve after their participation in the L2L program.*

attention from the focused mode to the diffuse (unfocused) mode, teachers finding the appropriate means to attract their attention (for example, using multiple ways of materials presentation: auditory, visual), after the first ten minutes of teaching, stopping and signaling to the students an external element that would distract them from the taught contents, after five minutes of teaching break, resuming the teaching of the contents, ensuring that each student is ready to focus again; 2. The principle of chunking - at the beginning of the lesson, the teacher presents an overview of the content to be learned and establishes the future objectives, topics or modules that will be taught. The children will have the big picture and will better understand the steps they have to take along time. They will receive small pieces of information which will be easier to deal to. Also, every lesson should start with teacher ensuring that students have knowledge of previous lessons so that the new information is attached to the already known information, providing concrete examples about the contents/concepts taught; 3. The principle of summarizing - after teaching a fragment of the content to be learned, the teacher invites the students to extract and write down the main idea or the key words or a short composition of the main ideas extracted from the whole lesson. Teachers provide students opportunities to practice or talk about the contents learned immediately after they have been taught, relating the main ideas of the lesson in other contexts where appropriate (e.g. discussions about rain in the Language and Communication class, but also in the Natural Sciences class); 4. The principle of recalling – after teaching a

new lesson, the teacher spend a few minutes to recall the previous lessons, ensuring that each student actively participates in the lesson by asking short questions about the concepts taught. He will help students to recall the main ideas of the lesson every, ensuring that each student has understood the new concepts taught, to take the newly taught concept and transfer it to another domain (eg commutativity of addition in math with commutativity of players on a sports field); 5. The principle of verification – testing students weekly to check their level of knowledge of the contents taught that week, providing real-life examples and inviting them to associate them with the contents taught, inviting students to bring real-life examples and discuss them, encouraging students to work in small groups (Harter, 2012) and cooperate in order to explain the new concepts, providing constructive feedback after each answer.

The study has a quasi-experimental design with two measurements, pretest and posttest. The data were organized and analyzed using Jamovi (The jamovi project, 2022).

Instruments

Children's perception of teaching methods according to L2L principles was measured with the L2L Questionnaire for Students, developed by us especially for this study. The instrument comprises 15 items relating to the techniques and strategies adopted by teachers to teach students how to learn in the classroom, three items for each of the five principles.

Answers are given on a five-point Likert scale, where 1 – not at all or very rarely, 2 – rarely, 3 – appropriate, 4 – often, 5 – very often or always. Examples of items: "Our teacher finds solutions to attract the students' attention (for example, shows boards or videos in class)", "Our teacher, at the beginning of the lesson, presents the subject of the lesson to the students", "Our teacher repeats the main ideas of the lesson also in other classes, where they fit (for example, he tells us about the rain in the Language and Communication class, but also in the Natural Sciences class)". Scores can range from 3 to 15 for each principle, with higher scores indicating greater use of L2L principles.

Self-perception was measured with the Self-Perception Profile for Children (Harter, 2012). The instrument includes 36 items, six for each of the six dimensions of self-perception, namely school competence, social competence, athletic competence, physical appearance, conduct and global self-esteem. Responses are given on a four-point Likert scale from 1 to 4, with participants first asked to select the "category" they identify with and then the degree of identification. Example item: "Some children behave very nicely, while other children do not behave very nicely." The child first chooses the category with which they identify (those who behave nicely or those who do not behave nicely), then determines the extent to which they identify (much like me or moderately like me). Scores can range from 6 to 24 for each dimension, with high scores reflecting a high level of that competency.

3. RESULTS

Descriptive statistics

Means, standard deviation, Cronbach Alpha coefficients, skewness and kurtosis for analyzed variables are presented in Table 1 (pretest) and Table 2 (posttest). The correlations among analyzed variables are presented in Table 3 (pretest) and Table 4 (posttest).

Table 1

Means, standard deviations, Cronbach Alpha coefficients, skewness, kurtosis pretest

| | M | SD | α | Skewness | Kurtosis |
|----------|-------|------|-----|----------|----------|
| PMCDpre | 13.72 | 1.13 | .68 | -1.21 | 1.61 |
| PDCIpre | 10.97 | 1.75 | .65 | -.91 | 2.83 |
| PSUMpre | 10.12 | 1.87 | .70 | .34 | .72 |
| PRECpre | 13.32 | 1.67 | .62 | -1.17 | 1.96 |
| PVERpre | 11.87 | 3.02 | .71 | -.76 | -.23 |
| COSCpre | 19.53 | 2.67 | .81 | -.42 | -.30 |
| COSOpred | 17.82 | 2.84 | .84 | -.76 | .40 |
| COATpre | 17.57 | 3.40 | .87 | -.30 | -.19 |
| ASFIpre | 20.41 | 3.43 | .87 | -.75 | -.31 |
| CONDpre | 18.68 | 2.58 | .78 | -.20 | .33 |
| STSIpre | 21.18 | 2.93 | .76 | -1.08 | .68 |

Note: PMCDpre – principle of switching attention from focused to diffuse mode pretest, PDCIpre – principle of chunking pretest, PSUMpre – principle of summarizing pretest, PRECpre – principle of recalling pretest, PVERpre – principle of verification pretest, COSCpre – school competence pretest, COSOpred – social competence pretest, COATpre – athletic competence pretest, ASFIpre – physical appearance pretest, CONDpre – conduct pretest, STSIpre –self-esteem pretest

Table 2*Means, standard deviations, Cronbach Alpha coefficients, skewness, kurtosis posttest*

| | M | SD | α | Skewness | Kurtosis |
|----------|-------|------|----------|----------|----------|
| PMCDpost | 14.06 | .84 | .64 | -1.03 | 1.76 |
| PDCIpost | 12.35 | 1.16 | .66 | .16 | -.33 |
| PSUMpost | 12.51 | 1.03 | .65 | .09 | -.07 |
| PRECpost | 13.81 | 1.08 | .71 | -.77 | .75 |
| PVERpost | 13.15 | 1.68 | .70 | -.49 | -.71 |
| COSCpost | 20.88 | 1.96 | .82 | .03 | -1.20 |
| COSOpst | 19.74 | 1.64 | .82 | -.55 | .59 |
| COATpost | 17.94 | 2.99 | .86 | .03 | -.74 |
| ASFIpost | 20.44 | 3.21 | .87 | -.79 | .11 |
| CONDpost | 19.78 | 2.14 | .79 | .14 | -.52 |
| STSIpost | 21.59 | 2.27 | .76 | -.77 | .30 |

Note: PMCDpost – principle of switching attention from focused to diffuse mode posttest, PDCIpost – principle of chunking posttest, PSUMpost – principle of summarizing posttest, PRECpost – principle of recalling posttest, PVERpost – principle of verification posttest, COSCpost – school competence posttest, COSOpst – social competence posttest, COATpost – athletic competence posttest, ASFIpost – physical appearance posttest, CONDpost – conduct posttest, STSIpost – self-esteem posttest

Table 3*The correlations among variables pretest*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------|------|------|------|-------|--------|-------|-------|------|-------|-------|----|
| PMCDpre | 1 | | | | | | | | | | |
| PDCIpre | .17 | 1 | | | | | | | | | |
| PSUMpre | .02 | -.14 | 1 | | | | | | | | |
| PRECpre | .24* | .07 | .08 | 1 | | | | | | | |
| PVERpre | -.15 | .21 | .09 | -.28* | 1 | | | | | | |
| COSCpre | .24* | .07 | -.06 | .27* | -.32** | 1 | | | | | |
| COSOpst | .25* | .08 | -.01 | .33** | -.19 | .51** | 1 | | | | |
| COATpre | .18 | .09 | -.09 | .18 | -.23 | .55** | .32** | 1 | | | |
| ASFIpre | .25* | .14 | .13 | .10 | -.11 | .55** | .38** | .29* | 1 | | |
| CONDpre | .19 | .14 | .06 | .16 | .10 | .31** | .28* | .26* | .36** | 1 | |
| STSIpre | .11 | .17 | .03 | .22 | -.06 | .47** | .52** | .29* | .60** | .32** | 1 |

Note: **. $p < .01$. *. $p < .05$

1. PMCDpre – principle of switching attention from focused to diffuse mode pretest, 2. PDCIpre – principle of chunking pretest, 3. PSUMpre – principle of summarizing pretest, 4. PRECpre – principle of recalling pretest, 5. PVERpre – principle of verification pretest, 6. COSCpre – school competence pretest, 7. COSOpst – social competence pretest, 8. COATpre – athletic competence pretest, 9. ASFIpre – physical appearance pretest, 10. CONDpre – conduct pretest, 11. STSIpre – self-esteem pretest

Table 4*The correlations among variables posttest*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|----------|------|------|------|------|------|-------|-------|------|-------|-----|----|
| PMCDpost | 1 | | | | | | | | | | |
| PDCIpost | .24* | 1 | | | | | | | | | |
| PSUMpost | .10 | .20 | 1 | | | | | | | | |
| PRECpost | .31* | .11 | .08 | 1 | | | | | | | |
| PVERpost | -.03 | .03 | .11 | -.12 | 1 | | | | | | |
| COSCpost | .24* | .12 | -.07 | .12 | -.11 | 1 | | | | | |
| COSOpst | -.01 | .07 | -.12 | .14 | -.05 | .22 | 1 | | | | |
| COATpost | .16 | .22 | -.05 | .00 | -.09 | .43** | .05 | 1 | | | |
| ASFIpost | .14 | .27* | .00 | -.03 | .07 | .41** | .21 | .22 | 1 | | |
| CONDpost | .16 | .21 | -.03 | -.04 | .01 | .26* | -.01 | .19 | .31* | 1 | |
| STSIpost | .04 | .16 | .07 | .12 | .01 | .39** | .34** | .31* | .47** | .16 | 1 |

Note: **. $p < .01$. *. $p < .05$

1. PMCDpost – principle of switching attention from focused to diffuse mode posttest, 2. PDCIpost – principle of chunking posttest, 3. PSUMpost – principle of summarizing posttest, 4. PRECpost – principle of recalling posttest, 5. PVERpost – principle of verification posttest, 6. COSCpost – school competence posttest, 7. COSOpst – social competence posttest, 8. COATpost – athletic competence posttest, 9. ASFIpost – physical appearance posttest, 10. CONDpost – conduct posttest, 11. STSIpost – self-esteem posttest

Hypotheses testing

H1. *Students' perception of teachers' teaching methods will improve after their participation in the L2L program.*

To test this hypothesis, a paired samples t-test was performed.

Table 5

Mean scores pretest and posttest for students' perception of teachers' teaching methods

| | N | M | SD | SE |
|----------|----|-------|------|-----|
| PMCDpre | 68 | 13.72 | 1.13 | .14 |
| PMCDpost | 68 | 14.06 | .84 | .10 |
| PDCIpre | 68 | 10.97 | 1.75 | .21 |
| PDCIpost | 68 | 12.35 | 1.16 | .14 |
| PSUMpre | 68 | 10.12 | 1.87 | .23 |
| PSUMpost | 68 | 12.51 | 1.03 | .12 |
| PRECpre | 68 | 13.32 | 1.67 | .20 |
| PRECpost | 68 | 13.81 | 1.08 | .13 |
| PVERpre | 68 | 11.87 | 3.02 | .37 |
| PVERpost | 68 | 13.15 | 1.68 | .20 |

Note: PMCDpre – principle of switching attention from focused to diffuse mode pretest, PDCIpre – principle of chunking pretest, PSUMpre – principle of summarizing pretest, PRECpre – principle of recalling pretest, PVERpre – principle of verification pretest, PMCDpost – principle of switching attention from focused to diffuse mode posttest, PDCIpost – principle of chunking posttest, PSUMpost – principle of summarizing posttest, PRECpost – principle of recalling posttest, PVERpost – principle of verification posttest

Table 6

Paired sample t-test for students' perception of teachers' teaching methods

| | | t | df | p | MD | SE | CI95% | | d |
|---------|----------|--------|-------|------|-------|-----|-------|-------|-------|
| | | | | | | | Lower | Upper | |
| PMCDpre | PMCDpost | -3.74 | 67.00 | .001 | -.34 | .09 | -.52 | -.16 | -.45 |
| PDCIpre | PDCIpost | -7.57 | 67.00 | .001 | -1.38 | .18 | -1.75 | -1.02 | -.92 |
| PSUMpre | PSUMpost | -15.55 | 67.00 | .001 | -2.40 | .15 | -2.70 | -2.09 | -1.89 |
| PRECpre | PRECpost | -3.78 | 67.00 | .001 | -.49 | .13 | -.74 | -.23 | -.46 |
| PVERpre | PVERpost | -4.92 | 67.00 | .001 | -1.28 | .26 | -1.80 | -.76 | -.60 |

Note: PMCDpre – principle of switching attention from focused to diffuse mode pretest, PDCIpre – principle of chunking pretest, PSUMpre – principle of summarizing pretest, PRECpre – principle of recalling pretest, PVERpre – principle of verification pretest, PMCDpost – principle of switching attention from focused to diffuse mode posttest, PDCIpost – principle of chunking posttest, PSUMpost – principle of summarizing posttest, PRECpost – principle of recalling posttest, PVERpost – principle of verification posttest

There are significant differences in all dimensions of L2L principles as perceived by students before and after participating in the L2L program. Thus, for the principle of switching attention from focused to diffuse mode, the pretest score was M = 13.72, SD = 1.13 compared to the posttest M = 14.06, SD = .84, the difference being significant, $t(67) = -3.74$, $DM = -.34$, $CI95\%(-.52, -.16)$, $p < .01$, the effect size being $d = -.45$. For the principle of chunking, the pretest score was M = 10.97, SD = 1.75 compared to the posttest M = 12.35, SD = 1.16, the difference being significant, $t(67) = -7.57$, $DM = -1.38$, $CI95\%(-1.75, -1.02)$, $p < .01$, the effect size being $d = -.92$. For

the principle of summarization, the pretest score was M = 10.12, SD = 1.87 compared to the posttest M = 12.51, SD = 1.03, the difference being significant, $t(67) = -15.55$, $DM = -2.40$, $CI95\%(-2.70, -2.09)$, $p < .01$, the effect size being $d = -1.89$. For the principle of recalling, the pretest score was M = 13.32, SD = 1.67 compared to the posttest M = 13.81, SD = 1.08, the difference being significant, $t(67) = -3.78$, $DM = -.49$, $CI95\%(-.74, -.23)$, $p < .01$, the effect size being $d = -.46$. For the principle of verification, the pretest score was M = 11.87, SD = 3.02 compared to the posttest M = 13.15, SD = 1.68, the difference

being significant, $t(67) = -4.92$, $DM = -1.28$, $CI95\%(-1.80, -.76)$, $p < .01$, the effect size being $d = -.60$.

H2. *Students' self-perception will improve after their participation in the L2L program.*

To test this hypothesis, a paired samples t-test was performed.

Table 7
Mean scores pretest and posttest for students' self-perception

| | N | M | SD | SE |
|----------|----|-------|------|-----|
| COSCpre | 68 | 19.53 | 2.67 | .32 |
| COSCpost | 68 | 20.88 | 1.96 | .24 |
| COSOpres | 68 | 17.82 | 2.84 | .34 |
| COSOpres | 68 | 19.74 | 1.64 | .20 |
| COATpre | 68 | 17.57 | 3.40 | .41 |
| COATpost | 68 | 17.94 | 2.99 | .36 |
| ASFIpre | 68 | 20.41 | 3.43 | .42 |
| ASFIpost | 68 | 20.44 | 3.21 | .39 |
| CONDpre | 68 | 18.68 | 2.58 | .31 |
| CONDpost | 68 | 19.78 | 2.14 | .26 |
| STSIpre | 68 | 21.18 | 2.93 | .35 |
| STSIpost | 68 | 21.59 | 2.27 | .27 |

Note: COSCpre – school competence pretest, COSOpres – social competence pretest, COATpre – athletic competence pretest, ASFIpre – physical appearance pretest, CONDpre – conduct pretest, STSIpre –self-esteem pretest, COSCpost – school competence posttest, COSOpres – social competence posttest, COATpost – athletic competence posttest, ASFIpost – physical appearance posttest, CONDpost – conduct posttest, STSIpost – self-esteem posttest

Table 8
Paired sample t-test for students' self-perception

| | | t | df | p | MD | SE | CI95% | | d |
|----------|----------|-------|-------|------|-------|-----|-------|-------|------|
| | | | | | | | Lower | Upper | |
| COSCpre | COSCpost | -7.90 | 67.00 | .001 | -1.35 | .17 | -1.69 | -1.01 | -.96 |
| COSOpres | COSOpres | -7.51 | 67.00 | .001 | -1.91 | .25 | -2.42 | -1.40 | -.91 |
| COATpre | COATpost | -3.26 | 67.00 | .01 | -.37 | .11 | -.59 | -.14 | -.40 |
| ASFIpre | ASFIpost | -.30 | 67.00 | .77 | -.03 | .10 | -.23 | .17 | -.04 |
| CONDpre | CONDpost | -5.74 | 67.00 | .001 | -1.10 | .19 | -1.49 | -.72 | -.70 |
| STSIpre | STSIpost | -3.02 | 67.00 | .01 | -.41 | .14 | -.68 | -.14 | -.37 |

Note: COSCpre – school competence pretest, COSOpres – social competence pretest, COATpre – athletic competence pretest, ASFIpre – physical appearance pretest, CONDpre – conduct pretest, STSIpre –self-esteem pretest, COSCpost – school competence posttest, COSOpres – social competence posttest, COATpost – athletic competence posttest, ASFIpost – physical appearance posttest, CONDpost – conduct posttest, STSIpost – self-esteem posttest

There are significant differences in most of the students' self-perception dimensions before and after participating in the L2L program. Thus, for school competence, the pretest score was $M = 19.53$, $SD = 2.67$ compared to the posttest $M = 20.88$, $SD = 1.96$, the difference being significant, $t(67) = -7.90$, $DM = -1.35$, $CI95\%(-1.69, -1.01)$, $p < .01$, the effect size being $d = -.96$. For social competence, the pretest score was $M = 17.82$, $SD = 2.84$ compared to the posttest $M = 19.74$, $SD = 1.64$, the difference being significant, $t(67) = -7.51$, $DM = -1.91$, $CI95\%(-2.42, -1.40)$, $p < .01$, the effect size being

$d = -.91$. For athletic competence, the pretest score was $M = 17.57$, $SD = 3.40$ compared to the posttest $M = 17.94$, $SD = 2.99$, the difference being significant, $t(67) = -3.26$, $DM = -.37$, $CI95\%(-.59, -.14)$, $p < .05$, the effect size being $d = -.40$. For physical appearance, the pretest score was $M = 20.41$, $SD = 3.43$ compared to the posttest $M = 20.44$, $SD = 3.21$, the difference being significant, $t(67) = -.30$, $DM = -.03$, $CI95\%(-.23, .17)$, $p = .77$, the effect size being $d = -.04$. For conduct, the pretest score was $M = 18.68$, $SD = 2.58$ compared to the posttest $M = 19.78$, $SD = 2.14$, the difference being significant,

$t(67) = -5.74$, $DM = -1.10$, $CI95\%(-1.49, -.72)$, $p < .01$, the effect size being $d = -.70$. For self-esteem, the pretest score was $M = 21.18$, $SD = 2.93$ compared to the posttest $M = 21.59$, $SD =$

2.27 , the difference being significant, $t(67) = -3.02$, $DM = -.41$, $CI95\%(-.68, -.14)$, $p < .05$, the effect size being $d = -.37$.

4. DISCUSSIONS

The results show not only that the students notice the improvement in the quality of teaching and the teacher's style of approaching lessons and classroom learning activities, but also an increase in self-perception as a result of students' participation in the L2L program.

In terms of implementation of L2L principles, students perceive significant changes in teachers' teaching style associated with all five principles. Teachers help them to a greater extent to alternate focused mode with diffuse mode during teaching activities, add additional visual elements, help students to extract the main ideas from learned concepts, play games to strengthen the assimilation of new information, and check the level of knowledge acquired by students with a higher frequency.

In terms of self-perception, excepting physical appearance, all perceived competences have improved following students' participation in L2L program. The results can be attributed to the fact that teachers adopt strategies that empower students, give them some control in the teaching-learning process, are more concerned with their learning needs, and use multiple ways of presentation of lesson contents. All these techniques and strategies contribute to increasing students' understanding and clarifying issues related to learning how to learn, which can increase their confidence in their own abilities. Thus, the important role of the relationship with the teacher and the climate created in the classroom, as well as the teaching methods and strategies, evaluation and feedback practices, were emphasized. During the L2L program, teachers managed to create an atmosphere that removed individual competition and negative social comparison, emphasizing team competition and comparing students' results with their previous results, thus individual progress. Students were given the opportunity to experience success regardless of their ability level and to have accomplishments that bring them personal satisfaction, which contributes to increased self-perception (Bong & Skaalvik, 2003). In addition to creating a climate of harmony and collaboration in the students' class, the teachers tried to focus on the students' learning needs, adapting the tasks and activities so as to cover these needs and match the students' zone of proximal development. Through the

techniques applied to teach children how to learn, teachers have therefore also contributed to improving the perception of students' competences in many areas.

When students are encouraged to explore the environment, to contribute to teaching activities, work in teams, analyze new concepts and relate them to everyday life activities, receive and give feedback, they feel more competent not only in the school, but also in other areas of life. They gain self-confidence and the courage to research, find out, ask questions and demand answers in order to solve problems. All these actions can contribute to building a healthy self-perception, to better school adaptation and implicitly to achieving higher school performance.

Research by Hattie (2009) demonstrated that metacognitive strategies are among the most effective approaches for improving student achievement. By teaching primary school students techniques for planning, monitoring, and reviewing their work, educators can encourage a deeper level of engagement with learning material. When students learn how to plan and reflect, they develop a greater sense of control and confidence in their ability to succeed, which has a positive effect on academic performance and motivation.

Learning how to learn fosters self-regulation, which is a key predictor of academic success and personal development. Self-regulated learners set goals, monitor their progress, and adjust their strategies as needed (Zimmerman, 2002). Teaching self-regulation early in primary school prepares students to take responsibility for their learning and helps them become independent, proactive learners.

In a rapidly changing world, the ability to learn independently and adapt to new challenges is essential. Teaching LHTL strategies in primary school lays the groundwork for lifelong learning by equipping students with skills that they will use throughout their lives. Research has shown that individuals who practice metacognitive skills are better able to adapt to new situations, solve complex problems, and navigate a variety of learning environments (Brown, 1987). Dignath and Büttner (2008) conducted a meta-analysis on the impact of metacognitive training on primary school students and found that LHTL instruction had lasting effects, improving not only academic performance but also students' adaptability and

resilience in different learning situations. When students learn how to manage their own learning, they are better prepared for

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