USE OF SELECTED STRATEGIES IN LEARNING AND THEIR IMPACT ON LIFELONG LEARNING

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Abstract
The article focuses on selected learning strategies that we acquire in school and extracurricular environments. The degree of their use in learning is an important determinant of lifelong learning. A learner who has mastered these strategies has a higher motivation for further education, higher self-confidence and achieves better results. In the empirical part of the work we describe work procedures, research objectives, research set and research methods. The quantitative design of the work is aimed at identifying the rate of use of individual strategies of critical thinking among secondary school students using a questionnaire with Likert-type questions. The results of the research were processed by mathematical and statistical methods. At the end of the work recommendations for pedagogical practice are proposed based on the theoretical analysis and specific research results.

Key words
Learning strategies, lifelong learning, self-regulation, problem solving, critical thinking

Introduction

Education represents an incredible wealth of any society. In the world of a changing society, information technology, artificial intelligence, it is not easy to navigate in the amount of information and search for relevant data. One of the key competences of lifelong learning is learning to learn. Practice shows that it is not enough to teach only scientific knowledge, but part of effective teaching must be the development of skills associated with critical thinking, especially the ability to identify key ideas and assumptions in arguments, recognize important connections, correctly interpret data, the ability to draw logical conclusions from available information, distinguish facts and assumptions, evaluate the reliability of evidence presented to support claims and the credibility of authority, orientation and understanding of the read text, the ability to reevaluate one's own beliefs, or effective decision-making and problem-solving...

The above represents the abilities that the student can acquire during the course of teaching but also through his own learning. The teacher uses various teaching strategies, which gradually become part of learning through repetition.

Learning strategies in practice

In school practice, we encounter several strategies that support the development of critical thinking, the application of which facilitates the process of further education and employment on the labor market. It is an

essential need for a person to acquire these competencies already during elementary or secondary education. Subsequently, he is capable of self-regulation, critical evaluation, critical thinking, reading comprehension, problem solving, and his attitude towards lifelong learning also changes.

Lifelong learning represents the continuous continuity of education throughout life. Therefore, experiences with education at an early age should not be associated with failure and negative personal experiences. Education and vocational training systems should be adapted to the needs of individuals (Lukacova, 2016). The above-mentioned author perceives life-long education as opportunities to find opportunities for further learning, opportunities to participate in various further education activities, to supplement and expand the education acquired so far, but also to complete interest-based education.

D. Willingham (2000) perceives strategies on the basis of broader contexts, that learning strategies significantly affect the degree of what and in what quality students remember, but also how they can subsequently use this information.

Skoda and Doulik (2011) perceive learning strategies as learning tactics, sub-steps and procedures that are organized in a well-thought-out procedure. There is a lot of research going on right now that looks at which strategies are considered the most important.

According to the OECD study, Slovakia was ranked among the countries that, compared to other countries, do not achieve significant results in education. There is a significant strengthening of passive forms of subject acquisition. An example of this is memorization, experiments carried out by teachers, a high level of teacher activity in class, while students usually remain in the role of passive observers, receivers of information or performers of assigned tasks according to the teacher's instructions. Less time was devoted to analyzing the problem, searching for answers, arguing, selecting information, etc. (Fridrichova, Trnka, Poliach, 2021). However, neuropsychology does not consider passive forms of learning to be effective approaches to the ability to use acquired knowledge. This is especially true if they are not followed by other strategies that will allow them to further process the information. Grammer et al (2013) suggests as alternative procedures for improving the learning process a combination of several strategies and methods, while the common feature should be a direction towards metacognition. Appropriately choosing teaching methods with regard to the educational goals and the potential of the pupils is thus shown to be an important factor for improving the educational results of the pupils.

If the student has developed learning strategies, he knows how to plan his learning, uses effective learning methods and knows how to complete learning tasks on time and successfully. Critical thinking, self-judgment, drawing conclusions and problem-solving skills are essential for effective learning strategies.

We consider the APVV project "Practice in the Center of the Subject Field Didactics, Subject Field Didactics in the Center of Practical Training", where the authors identified key adaptive teaching strategies applying a cognitive-oriented approach for the development of students' critical and creative

thinking J. Duchovicova et al (2020) specified the following strategies for the development of critical thinking in the school environment:
- Strategies for the development of self-regulation – here we can primarily include strategies that develop personality, volitional qualities and emotions associated with critical thinking, namely the willingness to take into account various alternatives, impartially assess justifications, development of metacognitive skills, monitoring and correction of one's own thought processes, checking the appropriateness of the chosen problem-solving strategies. We include the following procedures: creating space for the presentation of own solutions, using discussion, using problem-based teaching, preference for tasks with a greater number of correct solutions.
- Strategies for the development of systematic and interpretive skills - mainly represent strategies aimed at recognizing the problem, sorting information, defining concepts. Here we include procedures for guiding pupils to deduction demanding tasks more cognitively (tasks for analysis, evaluation, creativity), use of categorization, identification of basic concepts, creation of own notes is preferred.
- Strategies of argumentation - strategies lead to the identification and analysis of arguments, the search for evidence in an argument. We include procedures for using contradictions, leading to arguments, leading students to identify the differences between fact and opinion, leading students to evaluate the credibility of a source
- Strategies for drawing conclusions and solving problems - mainly include procedures leading to the formulation of alternative solutions to the problem, anticipation of consequences, formulation of arguments. We include procedures such as the use of various resources, guidance in formulating questions that support thinking, problem solving and drawing conclusions.
- Strategies for developing evaluation - evaluation is an assessment of the reliability of statements and the quality of arguments. It also includes an assessment of the reliability of the source of information, an assessment of justifications. We include procedures such as guiding students to identify key facts in the curriculum, structuring the curriculum.
- Strategies for the development of reading skills - these mainly include strategies based on working with the text, which lead to reading comprehension. We include procedures - use of digital teaching materials, use of graphic representations in the presentation of the curriculum (concept maps, handouts, tables, graphic representations), guidance for working with the text and creating your own notes.
These strategies became the object of investigation in our research. We found out to what extent the students use them and know how to work with them in individual lessons during the course of the lesson.

Methods of statistical processing and analysis of research data

For the purpose of statistical analysis and processing of collected data, we used SPSS for Windows version 21.0. We analyzed the obtained data at the level of statistical description using frequencies (N), relative frequencies (Nr), arithmetic mean (AM) and standard deviation (SD), median (Mdn),

mode (Mod), standard error of estimation (SE), coefficients skewness and kurtosis, minimum (Min) and maximum (Max) values. At the level of statistical inference, before making the choice of adequate statistical tests, we ascertained the fulfillment of the condition of normality of the data distribution, based on the skewness and spiciness coefficients, respectively. their z-score (Field, 2013). Since the assumption of normality was not confirmed, we decided to use non-parametric tests, namely Mann-Whitney U tests.

Research objective and hypothesis

The main goal of the work was to determine and analyze the status (use rate) of critical thinking strategies among high school students based on gender.

VH1: There is no statistically significant gender difference in the level of use of strategies in the selected schools.

Characteristics of the research set

The research team consists of high school students from Topoľčany, Nitra and Trenčín. These were the schools SSOŠ PG Topoľčany, Business Academy Trenčín, Sports School Nitra, Hotel Academy NR, Secondary Industrial School of Food NR, Secondary Vocational School of Construction NR, Grammar school Nitra. A total of 484 students participated in the research. We focused on grades 1-4 in the subjects of economics, pedagogy, civics, Slovak language, chemistry. The selection of the research sample was deliberate and available.

Table 1 Composition of the research population in terms of gender

GENDER	FREQUENCY	
	N	N_R
MEN	*155*	*32,0*
WOMEN	*329*	*68,0*
OVERALL	*484*	*100,0*

N – absolute abundance, N_R – relative abundance

Table 2 Composition of the research group in terms of type of school

TYPE OF SCHOOL	FREQUENCY	
	N	N_R
SSOŠ PG TOPOĽČANY	*152*	*31,4*
BUSINESS ACADEMY TRENČÍN	*89*	*18,4*
SPORTS SCHOOL NITRA	*83*	*17,1*
HOTEL ACADEMY NR	*41*	*8,5*
SECONDARY INDUSTRIAL SCHOOL OF FOOD NR	*45*	*9,3*
SECONDARY VOCATIONAL SCHOOL OF CONSTRUCTION NR	*23*	*4,8*
GRAMMAR SCHOOL NITRA	*51*	*10,5*
OVERALL	*484*	*100,0*

N – absolute abundance, N_R – relative abundance

Table 3 Composition of the research file from the point of view of the teaching subject

TEACHING SUBJECT	FREQUENCY	
	N	N_R
PEDAGOGY	*152*	*31,4*
ECONOMICS	*172*	*35,5*
CIVICS	*66*	*13,6*
SLOVAK LANGUAGE	*43*	*8,9*
CHEMISTRY	*51*	*10,5*
OVERALL	*484*	*100,0*

Research methods and stages of research

We used the following research methods based on our research purpose. Methods of preparation for scientific research activity - in the preparatory stage, we focused on orientation in the issue, collection and gathering of professional literature.

Data collection methods - our research method was a self-constructed questionnaire. The questionnaire was aimed at high school students. With the help of the questionnaire, it is possible to identify key strategies for the development of critical and creative thinking of pupils and the extent of their use by secondary school students. Specifically, students use the items to express what strategies (Strategies for the development of self-regulation, Strategies for the development of systematic and interpretive skills, Strategies for argumentation, Strategies for drawing conclusions and solving problems, Strategies for the development of reading skills) they consider important in their learning and put them on a scale. All items are formulated as declarative sentences that are answered using a five-point Likert-type scale (1–5). The research instrument consists of five identified strategies and each of them is verified by 3-4 items. Individual strategy items are formulated in terms of the most concise learning procedures.

Methods of processing the obtained data - the following mathematical-statistical methods belong to the methods with which we processed the obtained data: We analyzed the obtained data at the level of statistical description using frequencies (N), relative frequencies (Nr), arithmetic mean (AM) and standard deviation (SD), median (Mdn), mode (Mod), standard error of estimate (SE), skewness and kurtosis coefficients, minimum (Min) and maximum (Max) values. And non-parametric tests, specifically Mann-Whitney U tests.

Analysis of research results and recommendations for practice

We verified the assumption that there is no statistically significant gender difference in the level of strategy use in the selected schools using a series of Mann-Whitney U tests. These allowed us to compare male and female students in the use of individual learning strategies.

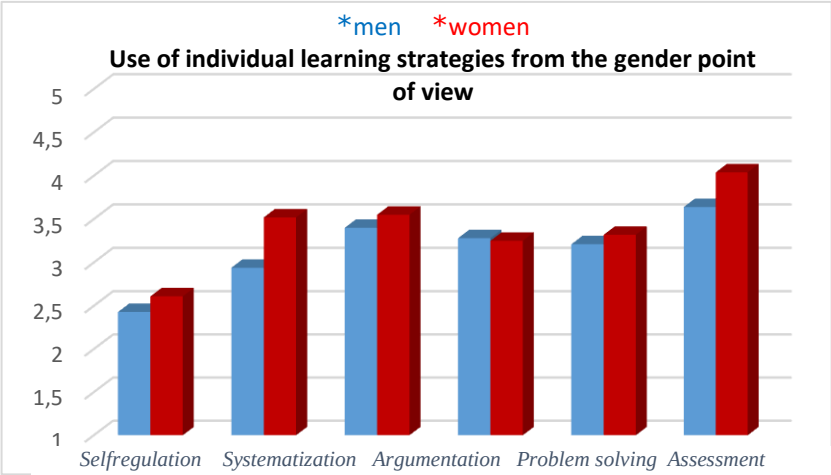
The results of the analysis showed that there are statistically significant differences between male and female students in the use of 4 learning strategies - self-regulation, $U = 22175.5$, $p = .020$, systematization, $U = 16489.0$, $p < .001$, argumentation, $U = 22209\ .0$, $p = .020$, reading skills, $U =$

16643.5, p < .001. Specifically, we found that girls use all the mentioned learning strategies to a significantly higher extent than boys. This means that, compared to boys, a higher degree of self-regulation in the learning process is typical for girls (boys: AM = 2.43, SD = 0.847; girls: AM = 2.61, SD = 0.772), a higher degree of systematization (boys: AM = 2.94, SD = 0.898; girls: AM = 3.52, SD = 0.868), higher level of argumentation (boys: AM = 3.40, SD = 0.702; girls: AM = 3.67, SD = 0.632), and a higher rate of reading skills (boys: AM = 3.64, SD = 0.679; girls: AM = 4.04, SD = 0.615). Regarding problem solving strategies, U = 24830.5, p = .639, and evaluation, U = 22872.0, p = .065, we did not find statistically significant differences in their use between girls and boys. It follows from the above that students use problem-solving and assessment strategies to a comparable extent, regardless of gender. The results are summarized in Table 4 and Figure 1. Since we identified statistically significant differences between boys and girls in their use in the case of 4 out of 6 studied learning strategies, the described findings did not support our research hypothesis. A set of strategies that were used primarily by girls manifests itself primarily in learning planning, working with the curriculum in logical units, receiving information based on arguments and searching for meaning in the text.

Table 4 Comparison of the use of individual learning strategies from the point of view of gender

Learning strategies	Gender						Mann-Whitney U test	
	Men (N = 155)			Women (N = 329)				
	AM	Mdn	SD	AM	Mdn	SD	U	p
Selfregulation	2,43	2,33	0,847	2,61	2,67	0,772	22175,5	,020
Systematization	2,94	3,00	0,898	3,52	3,67	0,868	16489,0	<,001
Argumentation	3,40	3,33	0,702	3,55	3,67	0,632	22209,0	,020
Problem solving	3,28	3,33	0,766	3,25	3,33	0,782	24830,5	,639
Assessment	3,21	3,25	0,642	3,32	3,25	0,626	22872,0	,065
Reading skills	3,64	3,75	0,679	4,04	4,00	0,615	16643,5	<,001

N – frequency, AM – group average, Mdn – median, SD – standard deviation, U – Mann-Whitney U test, p – level of statistical significance



Picture 1 Comparison of the use of individual learning strategies from the gender point of view

From the pedagogical point of view, each person is unique, with an individual learning style and own way of processing information, which should be taken into account by the teacher as the organizer of the learning process, regardless of whether they are girls or boys.

Lorenzo et al. (2006) described seven basic strategies thanks to which a teacher can help students to balance gender differences in the teaching process. It is primarily about integrating the daily experiences and interests of students of both sexes, working with existing preconceptions of students, an interactive environment supported by cooperation and communication, activities aimed at developing student understanding, activities for the development of key competencies for both sexes, alternatives in discussions between groups resulting from differences between the sexes, structuring the curriculum and accepting the diversity of both sexes.

An interesting finding is the result that there are differences between boys and girls and both sexes select individual strategies. However, another important fact is that the use of learning strategies is still not automatic. The strategies are most often used by pupils who have excellent results and are also interested in learning. They are looking for ways to make learning more efficient. The use of strategies is minimal for students with lower grades and they rely on inefficient methods (for example, memorization). Other research findings point to similar results, e.g., Gunisova, Kozarova (2020), Gunisova (2021), which addressed the issue of using strategies among university students, in terms of working with the text in its structuring. Their finding was that the linear structure of the curriculum, which leads the student to memorization, learning by heart, still remains the preferred form of working with the text. Despite the fact that work, e.g., with concept maps, leads students to meaningful learning, selection of essential information, it is still not among the leading methods and strategies in higher education. The obtained results lead us to the conclusion that students know individual

learning strategies, they also use them to a certain extent in their learning, but not to the maximum extent. They are perceived as procedures that help students understand the subject matter, facilitate its processing, support the importance of learning, which leads to self-confidence and motivation in further education. When practicing and implementing strategies that support the development of critical thinking and learning, we consider it important for the teacher to:

- the teacher should use a wide range of strategies, show students how to work with them,
- use strategies repeatedly and systematically so that students master the procedure with them,
- to show students the benefits that result from working with strategies, to encourage even weaker students to use them,
- enable students to choose their own learning strategy,
- create a positive environment that enables the development of individual strategies supporting the development of critical thinking.

We place emphasis on teachers to take their profession responsibly and to think about the fact that, through their work procedures, they influence the attitude of pupils to learning, to the acquisition of new knowledge and skills, orientation in professional life, and also influence the motivation for lifelong learning.

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