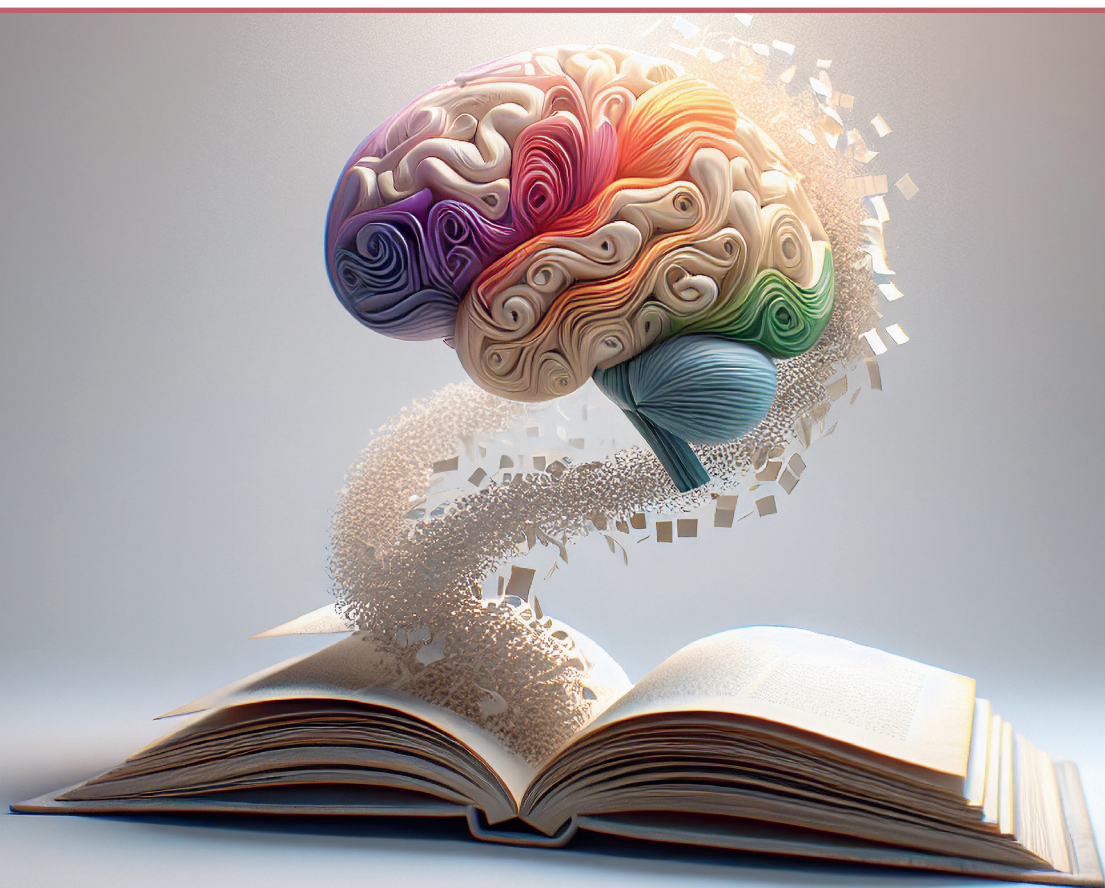


Elita Špehte

**REFLECTION – A LEARNING STRATEGY TO IMPROVE
A STUDENT’S PERFORMANCE AFTER PROVIDING
FEEDBACK**

Summary of the Doctoral Thesis



RIGA TECHNICAL UNIVERSITY
Liepaja Academy Centre of Pedagogy and Social Work

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Doctoral Student of the Study Programme “Educational Sciences”

**REFLECTION – A LEARNING STRATEGY TO
IMPROVE A STUDENT’S PERFORMANCE
AFTER PROVIDING FEEDBACK**

Summary of the Doctoral Thesis

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DOCTORAL THESIS PROPOSED TO RIGA TECHNICAL UNIVERSITY FOR PROMOTION TO THE SCIENTIFIC DEGREE OF DOCTOR IN SOCIAL SCIENCES

To be granted the Degree of Doctor (Ph. D.) in Social Sciences, the present Doctoral Thesis has been submitted for the defence at the open meeting of the RTU Promotion Council on December 11, 2024, at 10:00 a.m. at Liepāja Academy of Riga Technical University in Liepāja, 14 Lielā Street 14, Room 227.

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DECLARATION OF ACADEMIC INTEGRITY

I hereby declare that the Doctoral Thesis submitted for review to Riga Technical University for promotion to the scientific degree of Doctor in Social Sciences is my own. I confirm that this Doctoral Thesis has not been submitted to any other university for promotion to a scientific degree.

The Doctoral Thesis has been written in Latvian. It consists of an Introduction, two chapters, Conclusions and Recommendations, 26 figures, 29 tables, and 8 appendices; the total number of pages is 177, including appendices. The Bibliography contains 366 titles.

ABSTRACT

The Doctoral Thesis of Elita Špehte in pedagogy, in sub-sector school pedagogy, “Reflection – a Learning Strategy to Improve a Student's Performance After Providing Feedback”, was developed from 2019 to 2024 at the Institute of Educational Sciences of Liepaja University. Its scientific advisor is Professor Dr. paed. Pāvels Jurs.

The aim of the Doctoral Thesis is to develop a theory and practice-based model of the student's reflective learning process after the teacher's feedback for the improvement of the learning process.

In Chapter 1 of the Doctoral Thesis, a theoretical analysis of feedback and reflection was performed, the nature of feedback and reflection was characterized, the interrelationships of feedback and reflection, the model of the student's reflective learning process after the teacher's feedback was created, and the potential of reflection in the pedagogical process were analyzed.

In Chapter 2 of the Doctoral Thesis, an analysis of the research data has been carried out, the impact of reflection, the impact of reflection on feedback on student learning and performance improvement has been analyzed and the pedagogical prerequisites that ensure the use of students' reflection practice in the learning process have been characterized. The development of a model has been implemented and approbated, and a survey of students and teachers has been conducted about the benefits of the model of the student's reflective learning process after the teacher's feedback, as well as the comparison and interpretation have been made of the effects of the reflection process after providing a model of the student's reflective learning process after the teacher's feedback to the students of the main group and the control group of the study.

According to the research questions raised in the Thesis, the main conclusions emphasize the scientific and practical novelty of the research.

Keywords: feedback, learning process, learning strategy, reflection, students, teacher.

TABLE OF CONTENTS

ABSTRACT	4
THE GENERAL DESCRIPTION OF THE DOCTORAL THESIS	6
THE MAIN RESULTS AND CONTENT OF THE DOCTORAL THESIS	21
CONCLUSIONS.....	51
RECOMMENDATIONS	54
LIST OF REFERENCES	56

THE GENERAL DESCRIPTION OF THE DOCTORAL THESIS

In today's society, competitive professionals are needed, who are able to respond promptly to constantly changing life situations, think creatively, and direct their activities towards the achievement of set goals. That is why the new challenge for education in the 21st century is the balancing of educational goals to meet the changing needs of society.

“National Development Plan of Latvia 2021–2027” and “Education and Development Guidelines 2021–2027”, developed by the Ministry of Education and Science, define a vision for education where a person is interested and motivated to learn and develop throughout his life, is able to complexly use the acquired knowledge and skills and express attitudes, solving problems in changing real-life situations, and thus is a competent person who has developed cross-cutting skills, especially digital competence, learns in the form of both formal and informal education, can create his own individual learning style using various resources, and has access to individualized support for realizing his potential and planning and directing professional development (MK noteikumi Nr. 436, 2021). These goals reflect the priority areas defined in the framework of the OECD “Skills Strategy 2019” (OECD, 2019) – strengthening the results of students' skills, promoting a culture of lifelong learning, reducing the imbalance of skills in the labour market and strengthening the management of the skills system.

Analyzing the OECD report “Skills Strategies 2019” (OECD, 2019) on education development trends and comparing it with the “National Development Plan of Latvia–2027” (Saeima, 2020) and “Guidelines for the Development of Education 2021–2027” (MK noteikumi Nr. 436, 2021), it can be seen that there is a demand for a transition to an individualized and personalized approach in education, that is, compliance with the educational needs, interests and opportunities of the learners, as well as the use of technology in providing individualized solutions, where the teacher in the learning process should promote the student's ability to take responsibility for his own learning, that is, studying the learning content and using skills in solving real situations and problems. One of the goals of the "Competence Approach in Curriculum" project implemented by the National Education Content Centre is to bring to life the concept of expertise, which is explained as the ability of a person to use knowledge and skills and express attitudes in a complex manner, solving problems in changing real-life situations (Kakse, 2020).

The Council of the European Union (European Commission, 2019) has defined eight basic skills in the context of lifelong learning, which are essential for citizens for personal growth: a

healthy and sustainable lifestyle, employment, active civic participation and social inclusion. One of the core competencies is the personal, social and learning-to-learn competence, which includes the ability to reflect, manage time and information effectively, cooperate constructively with others, remain resilient in different situations, manage one's learning and career in order to cope with uncertainty and complexity, learn to learn, support their physical and emotional well-being, maintain physical and mental health, and be able to lead a health-based, future-oriented life, empathize and manage conflict in an inclusive and supportive context (European Commission, 2019). Core competencies have an individual basis and great importance at personal and societal levels, and they could be used in different fields of knowledge: new competencies must help to cope with the increasing challenges and problems of modern society, such as rapid social and technological changes, economic and cultural globalization, increasing individual and social diversity, competition, liberalization, changing values, instability of norms and inequality, poverty conflict in all its manifestations and ecological destabilization (Rychen & Salganik, 2003). It is believed that these problems affect different contexts at different levels, thus rendering traditional skills insufficient. Thus, the development of higher-order mental skills becomes essential, and three categories of important competencies are proposed:

- 1) autonomous activity that is associated with relative autonomy and identity;
- 2) use of interactive tools – a person's interaction with the world using physical and sociocultural tools;
- 3) functioning in socially heterogeneous groups – the ability to interact with people (Rychen & Salganik, 2003).

The OECD report “Future of Education and Skills 2030: Curriculum Analysis. Preparing humanity for change and artificial intelligence: Learning to learn as a safeguard against volatility, uncertainty, complexity and ambiguity” (OECD, 2018) points out that education today should promote the development of skills and attitudes that will enable people to succeed in the future. Such an approach requires a paradigm shift in education, focusing on interdisciplinarity and assessing competencies in interaction rather than on the acquisition of knowledge of individual content units. Consequently, the demands on school graduates are increasing: competence (proficiency) in various areas of life is expected from them.

In order for the student's learning result to be competence, the teacher's skills to manage appropriate learning, analyse and reflect, cooperate, and if the actions implemented by the teacher's teaching are effective, then the student's learning result will be deep understanding and competence (Oliņa et al., 2018).

Therefore, the emphasis of the teacher's work changes from giving information (the teacher explains everything himself) to teaching how to work with information (the teacher asks students stimulating questions that activate thinking) – evaluate, analyse and search for solutions by themselves, develop thinking skills, thus promoting the ability to independently and flexibly use knowledge in a wide variety of situations throughout life. Therefore, new competencies are expected not only from the student but also from the teacher. The constant and pronounced changes in the modern world mean that teachers must develop new competencies in order to adequately respond to the ever-increasing social demands. The competencies that teachers need to achieve are related to the tasks that they have to perform; therefore, it is necessary to identify and understand them.

In the description of the curriculum and approach developed within the framework of the project “Competence approach in the curriculum” implemented by the National Education Content Centre, the teacher's responsibility for the learning process is emphasized in order to successfully strengthen the shift in emphasis from the transfer of ready-made knowledge to the management of learning. It is emphasized that the teacher:

- 1) sets clear and meaningful achievable results for students;
- 2) offers diverse, complex, personally significant tasks in the learning process, which gives an opportunity to build a true understanding, to connect what has been learned in the learning process, encourages to choose the most suitable problem-solving techniques;
- 3) provides adequate support and regular feedback during learning;
- 4) encourages students to reflect on their learning and thinking (Valsts Izglītības satura centrs, 2017).

Thus, there is a need to implement the paradigm of humane and sustainable education in education, to create opportunities for the individual growth of each personality, to prepare specialists who are aware of the need for professional development, can develop skills that help to fit into the socially changing environment and ensure sustainable development. However, a contradiction is visible in the learning process: there are goals set by the school, goals set by the state, and goals set by the education system, but to what extent do the goals set by the student coincide with the goals set by the regulatory acts? Students find themselves in a situation where there is a contradiction between the idea that is expected from the student and the real-life situation, on the one hand, and between the idea of themselves as the subject of the expected pedagogical activity and their possibilities, on the other hand. Do the students want to learn by going deeper, to be actively involved in the learning process, to reflect on what they

have achieved? To what extent is it possible to ensure the quality of education so that it does not remain only recorded in regulatory acts without a real connection with daily activities outside the school?

One of the aspects that is formed in direct connection with ensuring the quality of education is the reflection of the didactic activity. A qualitative educational process makes you think about what can be used in the teaching process, identify problems and develop personalized solutions to the most complex problems (Boud et al., 2005).

The report of the World Bank, "Learning to Realize Education's Promise" (The World Bank, 2018), shows that students are more passive in the learning process year after year, but learning abilities must be increased over time. The report emphasizes that low-performing students should receive help, teachers should monitor each individual's situation, and provide differentiated, personalized educational methods that promote everyone's progress. The question emerges: Do only low-performing students need teachers' attention? How to balance the learning process so that even talented or high-performing students are given attention and their potential is developed? Thus, in pedagogical practice, there is a lack of a learning strategy in which students with different learning needs, goals and interests can learn successfully, both individually and cooperatively, in which the motivation of students is constantly promoted, the usefulness of learning is revealed, the individual goals of students and the goals set in school/normative documents are found. By understanding interrelationships, students build confidence in their actions, take responsibility for their outcomes, and connect the learning material to their personal lives.

Responding to change requires that it is necessary to pay attention to a renewed focus on theoretical approaches and academic engagement, reminiscent of the conceptual frameworks associated with education at the professional level. Self-reliance is inextricably linked to reflective practice (Jones & Ryan, 2015). Currently, the implementation and development of reflective learning in the context of education is a common goal of educational programs. Studies (Loughran, 2002; Cowan, 1998; Moon, 1999; Johns, 2004; Boud et al., 2005) on the modelling and implementation of reflection in curricula concluded that the nature and organization of reflection is determined by the country's political and social context, the traditions of the educational institution and goals. Research analysis (Whitaker, 1995; Moon, 1999; Sugerman et al., 2000) allows us to claim that the concept of reflective learning is aligned with the experience-based learning concept of researcher Kolb (Kolb, 1984), which emphasizes the importance of student experience in the educational process. The research conducted by teacher Bruns et al. (2016) points to a problem that is also relevant in the Latvian education

system: the time devoted to tasks is too short to be used for reflection on the feedback provided by teachers or for evaluating performance. In addition, assignments fail to distinguish key aspects of the 21st-century classroom environment, such as student engagement, effective use of instructional strategies, or emotional factors that support child development (Seidman et al., 2018). “The Framework for Qualifications of the European Higher Education Area” (European Union, 2018) ranks reflection among the most important competencies that a university graduate needs to help students and future specialists deal with problems and changing situations, both personally and professionally, thus indicating the need to develop reflection skills at all levels of education.

School heads must also be reflective in order to create the conditions necessary for students and teachers to engage in the reflection process. Effective schools are those that successfully move the learning and growth of all their students beyond their normal expected growth rates (Barber & Mourshed, 2007). The two most important variables affecting student outcomes are the quality of teaching and school leadership. Setting high standards for individual student achievement, measuring and tracking student achievement against standards, and then intervening when a student begins to fall behind those standards is the foundation of an effective school. Schools that collect, analyze, and reflect on student achievement data and then develop instructional strategies to improve student outcomes are more likely to be effective (Barber & Mourshed, 2007).

The need for such a strategy for the learning process is actualized, in which not only normative but also individual and whole class learning needs are identified, where students are allowed to realize their experience, how good they feel when they know or understand something about the world, themselves or other people and society as a whole, to reflect on one's experience and set future goals both in learning the curriculum and in solving real situations and problems, thus strengthening internal motives that are more durable than external ones, which provide self-confidence and faith in one's abilities to learn and do. Self-confident students will purposefully and independently move themselves towards learning and understanding the world.

The research problem is defined by several controversies.

1. The rapid course of the learning process and the student's confusion in it, fragmented learning of knowledge, selective use of pedagogical methods, learning the educational content as a pedagogical goal itself, lack of time for students to reflect on what they have learned without rushing on the feedback received, as well as the desire not to be

active during the learning process, thus student-centred in the context of the approach, it is necessary to choose pedagogical strategies and means that ensure the student's ability to take responsibility for his own learning, that is, learning the curriculum and using skills, solving real situations and problems.

2. In pedagogical practice, there is a lack of a teaching strategy in which students with different learning needs, goals, and interests can learn successfully both individually and in cooperation, in which the motivation of students is constantly promoted, the usefulness of learning is revealed, and the interrelationships between the individual goals of students and the goals set in school/normative documents are found, students gain confidence in their actions and are responsible for the consequences of their actions, as well as the learning content is integrated into the student's personal life and current events in society as a whole.
3. The changing social environment, the inconsistency of political decisions, and the consequences of the coronavirus disease (the COVID-19 pandemic) weaken teachers' motivation, sense of security, and confidence in the sustainability of changes, which, in turn, affects the learning process and students' attitude towards the learning process.

The topicality of the research is related to the paradigm shift in education, which emphasizes activities that promote involvement, cooperation, skill acquisition, feedback and reflection, respecting the student's goals and tasks during the learning process because the student both learns and teaches in this process. This determines the need to study how to provide support to the student during the learning process so that learning is effective, promoting the improvement of responsibility, knowledge and skills, as well as self-confidence, by purposefully organizing the pedagogical process oriented to the student's learning.

The pedagogical topicality emphasizes the need for mutual developmental cooperation between the teacher and the student, planning the learning process in such a way as to activate the student's activity, which promotes involvement, cooperation, skill acquisition, feedback and reflection, respecting the student's goals and tasks during the learning process and the understanding that students develop on the application of knowledge in solving problems in changing real-life situations.

The social topicality of the work is determined by the readiness of the students themselves to use the opportunities offered to them to participate in society and to get involved in solving current problems in society; thus, it is necessary to help develop students' understanding,

reflect on what is happening, which contributes to the formation of their confidence in the application of knowledge, solving problems in changing real-life situations outside the learning process.

The didactic topicality of the research is emphasized by the need for the quality of the teacher's pedagogical activity, which is able to create in the teacher motivation, a sense of security, and confidence in the sustainability of changes, which, in turn, promotes maximum learning and personal growth of each student.

Thus, the social, didactic and pedagogical topicality of the research problem and within the empirical part of the research identified discrepancies and led to the choice of the topic of the Doctoral Thesis: **“Reflection – a learning strategy to improve a student's performance after providing feedback”**.

The object of the Doctoral Thesis is the pedagogical process in elementary education.

The subject of the Doctoral Thesis is a reflection of the 6th-grade students in the learning process after receiving the teacher's feedback.

The aim of the Doctoral Thesis is to develop a theory and practice-based model of the student's reflective learning process after the teacher's feedback for the improvement of the learning process.

The formulated **research questions** are:

1. What characterizes effective feedback in the learning process?
2. What pedagogical prerequisites of the learning process ensure students' reflection on feedback in the learning process?
3. How does reflection on feedback in the learning process contribute to students' learning and improving their performance?

In order to find answers to the research questions, the following **research objectives** are put forward:

- 1) to analyze the scientific literature and sources on the nature and understanding of feedback and reflection in the learning process, systematizing theoretical approaches;

- 2) to develop the theoretical concept of the model of the student's reflection learning process after providing the teacher's feedback;
- 3) to conduct an evaluation study of student reflection after providing feedback;
- 4) to develop and approve the model of the student's reflection learning process after providing the teacher's feedback;
- 5) based on the study of the theoretical sources of knowledge and the data found in the empirical study to formulate conclusions and develop recommendations for the actualization of the learning process in the pedagogical practice of students' reflection on feedback.

The theoretical and methodological base of the research consists of:

- *feedback and its importance in the learning process* (Adcroft, 2011; Ajjawi, 2015; Anderson, 1971, 1972; Angela, 2015; Askew, 2000; Bangert-Drowns, 1991; Beydoğan, 2018; Bing-You, 2009, 2017; Black, 1998, 2009; Boud, 2010, 2013, 2015; Bull, 2004; Bunch, 2004; Butler, 1995; Carless, 2011, 2013, 2015, 2017, 2018, 2020; Certo, 2008; Chickering, 1987; Ching, 2016; Clarke, 2000; Conole, 2007; Delva, 2011; DeNisi, 1996; Conrad, 2013; Ende, 1983; Evans, 2013; Gamson, 1987; Gibbs, 2004, 2005; Gipps, 2000; Hahn, 1991; Hargreaves, 2000; Harvey, 2007; Hattie, 2007, 2009, 2012; Hellemans, 2004; Hsu, 2016; Jonassen, 1991; Jonsson, 2013; Kennedy, 2011; King, 2016; Kluger, 1996; Kramarski, 2001; Kuli, 1991; Kulhavy, 1971, 1972; Kulik, 1991; Lee, 2003; Lizzio, 2008; Lodge, 2000; Macfarlane-Dick, 2006; Macleod, 2016; Malecka, 2023; McCallum, 2000; McKenna, 2004; Molnar, 1991; Molloy, 2013; Morgan, 1991, 1999; Mory, 1996, 2004; Murphy, 2000; Nicol, 2006, 2007, 2008, 2014; O'Donovan, 2016, 2017; O'Reilly, 1999; Price, 2010, 2011; Race, 2005, 2007; Ramaprasad, 1983; Regehr, 2015; Rowntree, 1994; Robinson, 2013; Sadler, 1989, 2010; Sanchez, 2017; Sargeant, 2011, 2015; Sclater, 2007; Shute, 2008; Sieben, 2017; Simpson, 2004, 2005; Sondergeld, 2015; Taras, 2003; Telio, 2015; Timperley, 2007; Thorndike, 1913; Trowbridge, 2009; Tuckman, 2011; Van de Ridder, 2008; Wager, 1985; Warburton, 2007; Wiggins, 2017; Wiliam, 1998, 2009; Wiener 1954; Winne, 1995; Winstone, 2020; Yorke, 2004; Zeichner, 2001);

- *student-centred approach in the process of providing effective feedback* (Ambrose, 2010; Anwar, 2009; Bachrach, 2010; Ball, 2010; Bangert-Drowns, 1991; Best, 2006; Black, 1998, 2009; Blumberg, 2009; Boud, 2010, 2013; Brown, 2005; Bruning, 2001; Burke, 2009; Butler, 1987; Carless, 2011; Chan, 2010; Clariana, 2000; Costello, 2010; Crane, 2010; Čakāne, 2018; Deci, 2001; DeNisi, 1996; Denton, 2008; Dweck, 2006; Gan, 2011; Gibbs, 2004; Handley, 2011; Hattie, 2007, 2011, 2012, 2014; Hoska, 1993; Huc, 2010; Huth, 2004; Hysong, 2006; Jegede, 1992; Kessels, 2008; Kluger, 1996; Koestner, 2001; Kulhavy, 1985; Kulik, 1991; Lam, 2010, 2011; Latham, 1990, 2002; Lipnevich, 2009; Locke, 1990, 2002; Macfarlane-Dick, 2006; Mason, 2001; Menezes, 2016; Merrienboer, 1998; Merry, 2002, 2008; Millar, 2011; Mohr, 2010; Molloy, 2013; Moreno, 2004; Mory, 2004; Murphy, 2000; Nash, 2016; Narciss, 2004; Nicol, 2006, 2008, 2010; O'Donovan, 2011; Orsmond, 2002; Parboteeah, 2009; Paas, 1998; Price, 2011; Pugh, 2006; Race, 2015; Reiling, 2002; Richardson, 2001; Rozental, 2010; Rowntree, 1994; 2016; Ryan, 2001; Sadler, 1998; Salter, 2011; Schmitt, 2010; Shute, 2008; Simpson, 2004; Smith, 2005, 2009; Sweller, 1998; Thompson, 2001; Timperley, 2007; Topp, 1985; Wagner, 2000; Weaver, 2006; White, 1985; Winstone, 2016; Wiliam, 1998, 2005, 2009; Yang, 2011; Yates, 2014);
- *pedagogical potential of the reflection method in the learning process* (Archer, 2010; Barnett, 1997; Benammar, 2004; Billing, 2007; Brenan, 1991; Bringle, 1997; Boud, 1985, 2001; Boyd, 1983; Brockbank, 2000; Brooks, 2000; Carless, 2011; Chi, 2011; Clark, 1991; Collins, 1989; Colton, 1991; Cope, 2003; Cowan, 1998; Dempsey, 2001; Dewey, 1933; Dreyfus, 2004; Erickson, 1990; Fales, 1983; Grimmett, 1990; Haroutunian-Gordon, 1998; Hatcher, 1997; Hay, 2007; Hershkovits, 2004; Heyler, 2015; Holland, 2000; Karnieli-Miller, 2020; Keogh, 1985; Killion, 1991; Kolb, 1984; Krause, 2011; MacKinnon, 1990; Mann, 2009; McGill, 2000; Menekse, 2011; Mezirow, 1991; Moon, 2002, 2004; LaBoskey, 1994; Lam, 2011; Larrivee, 2008; Lin, 1999; Liu, 2015; Loo, 2002; Loughran, 1996; Oosterbaan, 2011; Pilling, 2007; Quinton, 2010; Riechen, 1990; Risko, 2001; Rogers, 2001; Roskos, 2001; Ross, 1990; Sadler, 1989; Salter, 2011; Sargeant, 2008; Schon, 1983; Schwarz, 2004; Sherman, 1994; Secules, 1999; Smallbone, 2010; Smith, 1989, 2007; Sparks-Langer, 1991; Stump, 2011; Sultana, 2009; Todnem, 1991; Van Woerkom, 2004; Valli, 1990; Vukelich, 2001; Vygotsky, 1978; Walker, 1985; Yang, 2011; Zimmerman, 1986, 2002);

- *interaction of reflection and feedback in the learning process* (Alvero, 2001; Anderson, 2001; Anseel, 2009; Bailey, 2010; Bentvelzen, 2021; Boekaerts, 2002; Boud, 1985; Bromme, 2014; Cohen, 2015; Cox, 2015; Davidi, 2005; DeNisi, 1996; DeRue, 2012; Dewey, 1933; Ellis, 2005; Ericsson, 2015; Eyler, 1999; Garner, 2010; Gibbs, 1988; Giles, 1999; Hall, 2002; Harden, 1996; Hatcher, 1997; Heen, 2014; Holmboe, 2015; Hutchison, 1998; Kluger, 1996; Kolb, 1984; Krathwohl, 2001; Lievens, 2009; Macfarlane-Dick, 2006; Mayer, 2005; Nicol, 2006; Sargeant, 2010, 2015; Schollaert, 2009; Seibert, 1999; Seifert, 2003; Smallbone, 2010; Stone, 2014; Stürmer, 2017; Von Wright, 1992; Williams, 2004).

The regulatory framework of the research consists of:

- *policy planning documents* (National Development Plan of Latvia 2021–2027; Guidelines for the Development of Education 2021–2027);
- *the content of education at the elementary level* (Regulation No. 747; Regulations on State Basic Education Standards, Sample Curriculum for English Lessons for Grades 1–9);
- *reports and studies of international organisations* (The United Nations Organization for Education, European Commission, Organisation for Economic Co-operation and Development, Council of Europe).

The Doctoral Thesis was carried out in four stages.

The first stage of the study (September 2019 – August 2020) is an analysis of scientific literature (scientific and methodological literature in educational sciences). An analysis of the research area: analysis of regulatory documents, sources on the nature of feedback and its importance in the learning process, effective feedback and its impact on student performance in the learning process and the nature of reflection was carried out, recognizing the importance of student responsibility and reflection; the research design was determined, and the research questions were raised.

In the second stage of the study (September 2020 – August 2021), the theoretical concept of the study was developed for the creation of a model of the student's reflection learning process after the teacher's feedback in order to develop a modern understanding of student-centred learning, the organization and direction of the learning process, which is a systematic

and purposeful activity of the student developed, and empirical research methodology is developed.

In the third stage of the study (September 2021 – August 2022), the empirical research program and justified research methods of the Doctoral Thesis were developed, the research sample was created, data collection was realised in the questionnaire process, statistical data analysis was performed, as well as data interpretation, inductive content analysis, the findings of the theoretical concept of the Doctoral Thesis were concretised and supplemented.

In the fourth stage of the study (September 2022 – February 2024), a research sample for the control group was created, data collection was realised, a model of the student's reflection learning process was created and approved, statistical data analysis was performed, as well as data interpretation, the findings of the theoretical concept of the Doctoral Thesis were specified, research conclusions and recommendations were presented, as well as designed to defend the Thesis.

The fifth stage of the study (February 2024 – August 2024) is the pre-defence of the Doctoral Thesis, clarification of theoretical and empirical findings, technical design, literary editing and preparation of accompanying documentation for the submission of the Doctoral Thesis.

The Doctoral Thesis is a qualitative research with its characteristic evaluation research, in which the following **research methods** are used:

1. Theoretical research methods:
 - the analysis of scientific and methodological literature;
 - the analysis of regulatory documents.
2. Empirical research methods:
 - data gathering methods: student and teacher surveys (written); content analysis of students' portfolios;
 - data processing methods by using the statistical data processing and analysis package *IBM SPSS Statistics 21.0*: Cronbach's Alpha test; descriptive statistics; *ANCOVA measurement*; graphical representation of data;
 - content analysis of qualitative data.

The base of research is formed of 77 students from the three sixth grades of one secondary school in the city of Ventspils.

The scientific novelty and theoretical significance of the research

1. Pedagogical prerequisites that ensure students' reflection on feedback in the learning process are defined.
2. The effects of reflection as a learning strategy after providing feedback on student learning and performance improvement are detected.
3. A model of the student's reflection learning process after the teacher's feedback for improving learning skills is developed.

Practical significance of the study

1. A description of the interaction of reflection and feedback in the learning process – prerequisites for effective feedback and prerequisites for application and effectiveness – is provided.
2. Pedagogical prerequisites that ensure the use of students' reflection practice in the learning process have been established.
3. In pedagogical practice, the model of the student's reflection learning process after the teacher's feedback for improving the learning process has been approved.
4. The students' learning strategy – reflection after receiving the teacher's feedback during the learning process – is defined.

Thesis for defence

1. Feedback in the learning process is personally significant and effective if it is used in a structured way, providing the opportunity for the student to receive information about the development of knowledge and skills, providing the opportunity for the student to identify future individual learning needs, which promotes understanding of the application of knowledge, develops learning and personality development-oriented a set of learning skills and values, builds self-confidence and promotes growth.
2. Student reflection as a learning strategy is characterized by pedagogically structured, deliberate and targeted teaching activities that allow students to develop personal learning experiences, choose and check the validity of their individual learning activities based on their needs, improve individual learning experience, recognize the value of knowledge and develop their cognitive and emotional skills.
3. By applying feedback and reflection, the teacher leads the pedagogical process, creates a connected and supportive learning environment, eliminates gaps in the student's performance and improves the level of learning performance. Students who are

involved in the reflection process set goals, collect, interpret and analyse their experiences; think critically about the context; plan their actions; look for solutions; review and check the acquired knowledge; find out its depth and strengthen it, creating a new learning experience.

4. Reflection after providing teacher's feedback as a learning strategy is a pedagogically structured and guided cognitive process that promotes student learning, which increases the potential of learning dialogue and contributes to the development of cross-cutting competencies in the learning process if a purposeful and justified learning process is implemented, emphasizing the student's individual responsibility for successful and a result-oriented learning process, which includes both setting goals and planning a learning strategy.

Aprobation of research results

The results of the Doctoral Thesis have been published in scientific, peer-reviewed journals.

1. Jurs, P., Samuseviča, A., Kulberga, I., & **Špehte, E.** (2024). *Youth change in self-assessment of tolerance in comparative context 2017-2023: empirical research*. Atlantis Highlights in Social Sciences, Education and Humanities, 17, 167–174. https://doi.org/10.2991/978-94-6463-380-1_16
2. Jurs, P., **Špehte, E.**, Samusevica, A., & Kulberga, I. (2023). Educational prerequisites to ensure the use of students' reflection practice in the learning process. *Nurture*, 17(4), 664–671. <https://doi.org/10.55951/nurture.v17i4.458>
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The author’s reports on the results of the study and acquired knowledge were presented and discussed in the local and international scientific conferences.

1. 16th International Scientific Conference QUALITY DIMENSIONS OF EDUCATION IN THE KNOWLEDGE SOCIETY, Liepāja, Latvia, April 25–26, 2024. Report “*Student reflection learning process model after receiving teacher’s feedback*”.
2. 9th International Conference on Lifelong Education and Leadership for All, Coimbra, Portugal, 6–8 July 2023. Report: “*Youth Change in Self-assessment of Tolerance in Comparative Context 2017–2023: Empirical Research*”.
3. 23rd International Scientific Conference SOCIETY AND CULTURE, Liepāja, Latvia, November 12–13, 2020. Report: “*Inclusive education in the associative view of teachers*”.
4. International Scientific Conference QUALITY DIMENSIONS OF EDUCATION IN THE KNOWLEDGE SOCIETY, Liepāja, Latvia, April 2, 2020. Report “*The importance of feedback in the teaching and learning process*”.
5. 14th International Scientific Conference SOCIETY, INTEGRATION, EDUCATION, Rēzekne, Latvia, May 22. Report: “*The Value and Topicality of Feedback in Improving the Learning Process*”.

Activities in international projects

1. FLPP project “Transformation of Educational Value for Cultural and Economic Growth of Social Community” (IzVeTSKKEI), project No. Izp-2020/1-0178.
2. ERASMUS+ KA2 – LET’S IN-SCAPE INTO EUROPE, No. 2021-1FR01-KA229-079787_6.

The findings of the empirical part of the study were presented at the following events.

1. In the methodical support seminar for the professional development of teachers on January 5, 2024, in Liepājas Dzintara Secondary School. The topic: “*Student reflection learning process model after receiving teacher’s feedback*”.

2. On March 15, 2023, sharing experience in Kuldīga, Talsi, and Ventspils districts and Ventspils city of the Pedagogical Experience Forum.
3. On January 4, 2023, in Ventspils Secondary School No. 6, a model of the student's reflection learning process after providing the teacher's feedback for the improvement of the learning process was presented.
4. In May 2022 in Turkey, ERASMUS+ KA2 – LET'S IN-SCAPE INTO EUROPE, No. 2021-1FR01-KA229-079787_6 two seminars, "*Reflection and feedback in project work*", were conducted.
5. On August 26, 2022, a seminar was presented for the foreign language teachers of Ventspils comprehensive schools. Topic "*Reflections as a learning strategy after providing feedback in English lessons*".

THE MAIN RESULTS AND CONTENT OF THE DOCTORAL THESIS

The Doctoral Thesis consists of an annotation, introduction, two chapters (12 sections), conclusions, recommendations, thesis for defence, a bibliography and a list of sources consisting of 336 titles and eight appendices. Sources in Latvian, English and German languages were analysed during the development of the Doctoral Thesis. Theoretical and practical knowledge of the results has been shown in 29 tables, 26 figures, and 174 pages, including appendices.

Introduction provides the substantiation of the selection of the research topic and its topicality; the description of the research problem and defining of the multifaceted context of the research; the aim of the research; the research object; the research subject; the research questions and the research objectives. The methodological substantiation, information about the research base school, research methods, the description of the development stages, the scientific novelty of the Doctoral Thesis, practical significance, and reflection on the approbation of research results have also been provided in the introduction.

Chapter 1 of the Doctoral Thesis, “Theoretical analysis of feedback and reflection in the learning process”, consists of five sections. In the first part of the theoretical analysis of the essence of feedback was carried out, the conditions of effective feedback focused on the student were characterized, the reflection process in the learning process was characterized, reflection models were analysed, a model of the student's reflection learning process after the teacher's feedback was provided, as well as the interrelationships between feedback and reflection were revealed.

In **Section 1.1, “Characterization of the nature of feedback”**, the theoretical analysis carried out reveals that providing feedback is an integral part of the learning process, which ensures an effective teaching process. One of the fundamental questions of feedback is how to improve the information provided by teachers, which allows students to both reactivate and reinforce prior knowledge and focus on important aspects of what they are learning (Boud & Molloy, 2013). Therefore, feedback is one of the prerequisites for successful cooperation in the learning environment, and it is an important part of the formative evaluation process.

The chapter emphasizes that systematic evaluation provides teachers and students with answers to the questions: *What to learn? What has been achieved, and what has not? What to do next?* (Black & Wiliam, 2009; Hattie & Timperley, 2007; Nicol, 2007).

The chapter explains different types of feedback, such as *formative feedback, summative feedback, formal feedback, informal feedback, external feedback, internal feedback, informational feedback* and others, which include various activities and strategies such as participation, interaction in discussions, feedback to groups on group work (private or public), peer collaboration, reflection, individual work (Nicol, 2009).

Definitions of feedback describe the multidimensional nature and potential importance of feedback in various pedagogical situations where feedback information is essential to achieve improvement or progress, indicating the different forms of feedback in which information about what has been done or achieved is provided to change or improve a student or system performance, understanding, or behaviour. Thus, it can be concluded that feedback in education is used to promote learning by offering information about achievement, alignment with goals, and helping to improve understanding and performance.

In order to understand and fully characterise feedback, a definition of feedback is given, revealing that feedback is a purposeful and premeditated critical activity of the learning process, which is used in a structured way by the teacher to help students learn and to provide students with information that allows them to determine, what knowledge and skills the students have acquired and which still need to be acquired, identifying the future directions of learning development.

Thus, it can be concluded that feedback is very important for the development of competence and confidence of both teachers and students at all stages of education. It provides the teacher and student with evidence of current knowledge and skill development. Feedback provides an opportunity for students to reflect on their performance and understand their strengths, as well as identify areas for improvement and for teachers to reflect on their teaching strategies. Feedback encourages students to gain some control over their learning, which improves student learning and academic performance and achievements, thereby increasing students' engagement and understanding of their strengths and challenges, and also opens up opportunities for growth for both students and teachers. An active teaching and learning environment increases students' confidence and enthusiasm throughout the learning process.

Section 1.2, “Effective feedback – student-centred feedback”, describes the most important theoretical findings: what teachers should do to provide ideal written or oral feedback (Nicol & Macfarlane-Dick, 2006), what factors affect the usability of feedback (Nicol, 2010), how ideally it should be provided (Carless et al., 2011), and why students are (dis)satisfied with the feedback they receive from teachers (Weaver, 2006; Winstone et al., 2016).

A student-centred approach means that the student is at the centre. In the context of feedback, it is important to identify the student's previous knowledge, skills, attitude, and areas in which the student has had difficulties and carefully consider appropriate learning measures, advise and compare results, and set goals and tasks (Rowntree, 1994). As a result of appropriate feedback, students acquire qualities such as:

- 1) understanding of learning content;
- 2) self-confidence about learning abilities and knowledge acquisition;
- 3) problem solving ability;
- 4) the ability to correct and evaluate learning situations;
- 5) the ability to communicate the acquired knowledge in a real-world context (Blumberg, 2009).

The main purpose of feedback is to improve students' learning, which means to reduce the gap between current understanding, performance, and target (Hattie & Timperley, 2007). Feedback, as part of the assessment process, has a positive impact on learning when it targets weak areas of student performance and provides specific guidance to the student about them, preferably without grades (Black & Wiliam, 2009). Feedback should cover the characteristics of the student's work, including both strengths and weaknesses, include suggestions for what the student can do to improve, and avoid comparisons with other students (Black & Wiliam, 2009).

Also, the new educational content framework in Latvia (MK noteikumi Nr. 747) provides for the effective use of feedback in the learning process. Effective feedback is information about the student's progress towards the learning goal. To help achieve an effective result, the feedback must be:

- 1) informative and supportive to promote a positive attitude towards learning;
- 2) timely to allow to inform about learning and work;
- 3) frequent and specific enough to help students to learn and work (Boud, 2010).

Researcher A. Rozental and his colleagues (Rozental et al., 2020) have developed eight components that should be considered when providing feedback:

- 1) to focus on content that interests the student;
- 2) to understand emotions;
- 3) to motivate the student;
- 4) to develop reflection skills using various questions;
- 5) to monitor the student's emotional state;
- 6) to avoid using a negative tone;
- 7) to care and share experience as a teacher;
- 8) to maintain an open dialogue to explore the student's experience through feedback.

Thus, it can be established that feedback is not related to highlighting the student's failures or making judgments according to the teacher's perception but is based on the student's needs. Good quality feedback is not only accurate, timely, comprehensive and relevant but also accessible to the learner; it has educational value, and it should give the learner confidence and hope as a result (Gibbs & Simpson, 2004; Sadler, 1998; Weaver, 2006).

Effective feedback gives teachers and students answers to the questions: *What to learn? What has been achieved, and what has not? What to do next?* (Black & Wiliam, 2009; Hattie & Timperley, 2007; Nicol, 2008). In the theoretical approaches of researchers Black and William (2009) and Hattie and Timperley (2007), emphasis is placed on the fact that feedback is aimed at achieving changes in the education of students so that students' understanding and performance correspond to the specific learning goals. Both models are based on three similar basic elements that must be addressed in the feedback process.

The effectiveness of feedback depends on several factors. In order to avoid ineffective or even harmful effects on student performance, effective feedback must consider the student's learning goals and the structural characteristics of the feedback (Narciss & Huth, 2004).

Researcher Howard (1997) states that for feedback to be effective, four important criteria must be considered:

1. The content of feedback should provide accurate information about correct and incorrect answers and should be accurate information indicating skills and knowledge. Feedback should be specific and should address both the assessed performance and the learner's demonstrated abilities.
2. The degree to which feedback is individualized – the extent to which performance should be assessed individually. The higher the number of responses, the greater the chance to evaluate and provide more individualized feedback.

3. Timeliness of feedback – timely feedback is more effective than delayed feedback, so feedback should be given immediately.
4. Feedback sources and delivery method – these two parameters are interrelated and greatly influence the capabilities of all other feedback criteria. For example, feedback automatically provided by a computer provides information about a specific person's performance – it is individualized and fast, but provides information of limited content. On the other hand, in group conferences and seminars, the feedback is immediate, more individualized, and also more comprehensive, since each student can ask different questions about more different content. The delivery method also determines the source of the feedback. It is possible to provide immediate feedback to teachers and classmates in face-to-face conferences, but this option is excluded in the case of automatic, computer-generated feedback (Howard, 1997).

The criteria mentioned above do not point to specific characteristics that should be associated with feedback but rather to the components of feedback that teachers should take care of when creating it.

It can be concluded that feedback is effective if the student understands the purpose of the task, which is clearly formulated, and the student knows the evaluation criteria, feedback comments are focused on positive aspects, and criticism is constructive and supportive, which, as a result, helps to improve performance. This type of feedback not only promotes changes in performance, making it more successful but also includes an aspect of student's self-evaluation, supporting student's autonomy and responsibility. Effective feedback provides information not only on task performance but also on how to improve the learning process and perform self-regulation, promoting both task understanding and process planning and execution. On the other hand, ineffective feedback draws attention to answers that contain errors but does not offer information or support for improving or understanding performance, compares with other students, relies on external rewards, and comments on the student's personal characteristics rather than providing information about the processes performed or about performance.

Based on the analysis of the literature, it is found that in order to provide an opportunity to learn, students must understand the purpose of feedback and evaluation criteria, actively participate in the learning process, monitoring the progress of this process. Feedback is effective and learner-centred if it allows learners to do, receive suggestions for improvement, reflect on their learning, assess themselves and correct mistakes (Fig. 1).

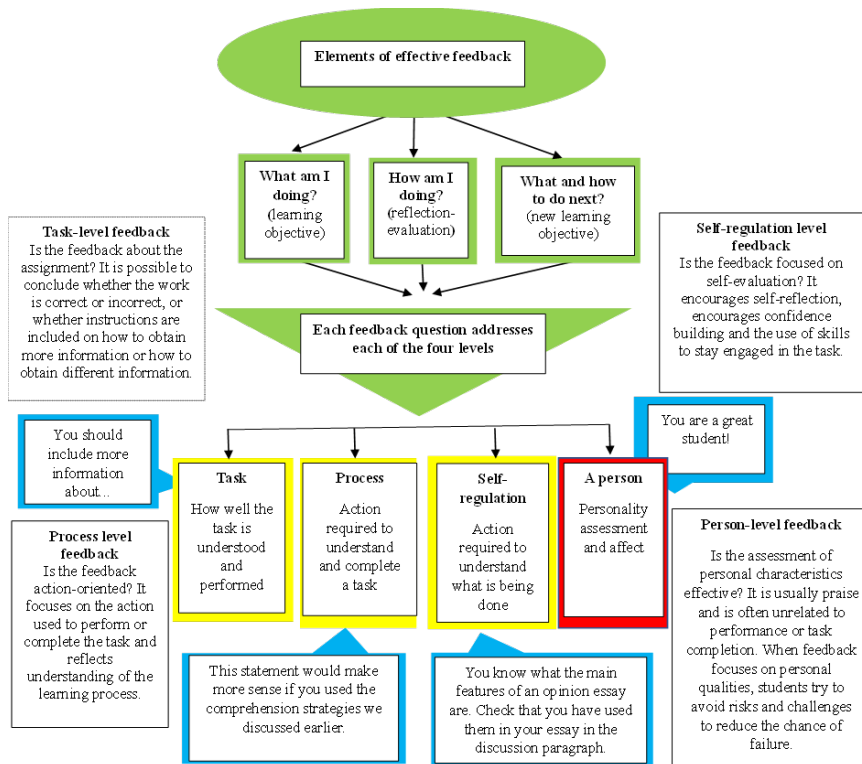


Fig. 1. Characteristics of effective feedback (Hattie & Timperley, 2007).

In Section 1.3, “Reflection in the learning process”, analyzing the nature of reflection, it can be concluded that reflective thinking is already present in Plato's theories, where it is identified as Socratic questioning and dialogues. Here, dialogue is considered the key to reflection, which creates deep interest and genuine doubt about the topic of conversation (Brockbank & McGill, 1998; Haroutunian-Gordon, 1998).

Philosopher Dewey (1933), the creator of the concept of reflection, defines *reflective thinking* as a cognitive activity that begins with confusion, is active and persistent, takes into account any belief or knowledge, involves responsibility for future consequences, and is both retrospective and progressive. This description of reflection illustrates the process of thinking through a problem that involves solving a problem, from observing difficulties to experimentally testing a solution (Dewey, 1933).

On the other hand, the philosopher Schon (1983) connects reflection and experience, creating his own concept of reflection activity – discovering, criticising, restructuring and checking the intuitive understanding of experienced phenomena on the spot. Focusing on reflection as a mechanism for change, *reflective learning* is also defined as a process of introspection and exploration of an issue of concern caused by experience, making and clarifying the meaning of one's experience, resulting in a changed conceptual perspective (Boyd & Fales, 1983). Likewise, *reflection* and *reflective learning* have been defined as adaptive learning (van Woerkom, 2004), self-construction (Dempsey et al., 2001), self-awareness (Loo, 2002), coordinated understanding (Maclellan, 2004) and critical self-reflection (Cope, 2003). On the other hand, researchers Brockbank and McGill (2012) define reflection as a process in which experience is taken into account to gain meaning and conceptualisation and relate to a specific situation from another perspective. Researchers Hatcher and Bringle (1997) claim that reflection provides an opportunity to gain a broader understanding of the field and develop self-evaluation skills. From these definitions, it is understood that an important outcome of this process of inquiry and internal examination is a change of perspective as new information and experiences are gained (Hay et al., 2004). Researchers Boud et al. (1985) noted that reflection is an integrated learning process with several, albeit non-linear, dimensions. Boud (2001) believes that reflections on the operational process consist of three elements:

- 1) returning to the experience, which is defined as giving an account of what happened;
- 2) paying attention to feelings or focusing on feelings or emotions that were (or are) presented;
- 3) reappraisal of experience, defined as relating new information to what is already known, looking for connections between new and old ideas, determining the authenticity of one's own ideas and feelings, and creating new knowledge.

It can be concluded that reflection is an important aspect of transformative learning – the kind of learning that changes students' worldviews and self-understanding (Brooks, 2000; Mezirow, 1991).

Studies have been conducted on reflection in education (Moon, 2004; Billing, 2007; Boud et al., 2005; Rogers, 2001); however, there is no unified definition of reflection or an approach to using reflection in the teaching and learning process. It has been studied that by reflecting, the student deepens the learning process (Moon, 2004), acquires a more complex and integrated structure of knowledge, and acquires accessible and usable knowledge (Billing, 2007). Reflection in a learning context is a general term for those intellectual and emotional activities

that individuals engage in to explore their existing experiences and gain new understanding and experience (Boud et al., 1985).

Reflection in the learning process is necessary for students to repeat what they have learned and improved, as well as for immersive learning. It gives students the opportunity to document their learning and provide feedback on their learning, as well as build on and share their experiences. Through reflection, students identify what they have accomplished and that they are continuously learning and building skills (Helyer, 2015). Critical reflection examines and questions the context surrounding the experience. Contexts are usually taken for granted, but they are the stage from which experience is drawn (Bateson, 2000). In critical reflection, students are faced with a series of questions: *What was the situation? Who was involved? What was he or she thinking? Why did this happen? Why did he or she do it?* etc. (Bateson, 2000).

Concept analysis reveals important commonalities in defining reflection: it is a cognitive process or activity that creates knowledge about cognition and how that cognition is regulated (Benammar, 2004; Dewey, 1933; Mezirow, 1991; Schon, 1983; Loughran, 1996; Cowan, 1998). Boud et al. (1985) emphasize that in addition to the cognitive dimension, the emotional dimension is also important in reflection, and the role of experience is also emphasized (Dewey, 1933). Philosopher Dewey's (1933) theory of reflective thinking notes that action and thinking are interrelated and occur simultaneously. On the other hand, researcher Mezirow (1991) pointed out that thoughtful action and reflection can happen during development or challenge.

Researchers have tried to explain the value of reflection. Researcher Moon (2002) states that reflection facilitates the diagnosis of the main strengths and weaknesses as well as learning the approach to asking questions, while researcher Sadler (1989) claims that self-assessment skills are developed in this way. Transferring nonverbal self-knowledge to improve performance increases the value of learning and helps students develop a learning strategy. A student who reflects, practices and demonstrates knowledge based on asking themselves questions about the situation they are in to create a new and different frame of reference (Smith & Pilling, 2007). Through reflection, students learn from the social experience of their community and connect it to academic knowledge (Ash & Clayton, 2009; Kawai & Kimura, 2014).

Reflection has also been cited as a key component of the self-directed learning process (Winne, 2001). Researcher Zimmerman (1986, 2002) describes self-directed learning as a process where students are responsible for their decision-making processes, which regulate what forms of knowledge they will choose and how they will use them.

In addition, in the process of self-directed learning, students set their own goals, organise the learning process and use strategies to achieve the set goals, manage and optimise available resources, monitor progress and continuously reflect (Zimmerman & Kitsantas, 2005). There are several models of self-directed learning, such as constructivist or social-cognitive, based on different theoretical perspectives. All these models include student reflection as a key component during the learning process (Menekse et al., 2013; Quinton & Smallbone, 2010; Zimmerman, 2002). Thus, reflective practice becomes an important tool that helps students explore and articulate lived experiences, current experiences, and newly created knowledge (Osterman & Kottkamp, 2004). Teachers are advised to use reflective practice in their lessons so that students better understand what they know and do and how they develop their knowledge (Loughran, 2002; Lubbe & Botha, 2020). It can be concluded that reflective practice is an important part of the learning process (Shek et al., 2021; Childs & Hillier, 2022; Ruffinelli et al., 2022) as it can help students review their experiences and develop relevant skills when necessary.

In competency-based education, teachers need competencies to support students' reflective processes. Currently, teacher competence is defined as an integrated concept that denotes the knowledge, skills and attitudes of teachers in a certain context when performing professional tasks (Sultana, 2009). In the context of developing students' reflection skills, it is desirable that teachers' support is specifically tailored. This means that teaching, tasks, learning, and feedback are related to a student's zone of proximal development – the range of skills that a student can achieve with assistance but cannot yet perform independently (Vygotsky, 1978).

This type of support fits the cognitive apprenticeship model (Collins et al., 1989). On the other hand, researcher Smyth (1989) concludes that, in the teaching process, teachers should take into account that:

- 1) reflection should not be limited to testing technical skills; it must equally apply to the ethical, social and political contexts in which teaching takes place;
- 2) reflection should not be limited to teachers who individually reflect on their teaching;
- 3) reflection is a process whose main purpose is to question the dominant myths, assumptions and hidden message systems that are implicit in the current way of organising teaching and education;
- 4) reflection is also based on the improvement of educational practice and social relations, which are the basis of this practice;
- 5) reflection is based on the belief that knowledge about teaching is in a preliminary and incomplete state and, as such, is continuously modified as a result of practice;

- 6) reflection occurs when it begins with the experience of other practitioners, as assistance is provided in the process of describing, informing, confronting and reconstructing theories.

Although reflection is an invisible cognitive process, it is not exactly intuitive (Plessner et al., 2011). People, especially those who lack experience, may lack adequate intuition (Greenhalgh, 2002). To achieve a certain level of reflection, they need guidance, and reflection can be with others or in groups (Gibbs, 1988; Grant et al., 2017) or through individual feedback (Karnieli-Miller, 2020); they can be both teachers and peers alike, which can help provide interpretation of different perspectives and exploration of behaviour (Karnieli-Miller, 2020). Therefore, teachers must also learn to justify their basic values, attitudes, thoughts and emotions, as well as critically challenge and evaluate the assumptions of daily practice.

Reflection is usually more effective when it is a guided activity than a spontaneous one (Sargeant et al., 2008). A teacher who guides the student through the reflective process by using guiding, open-ended questions can guide the student toward a goal. Encouraging the reflection process engages both students' cognitive and emotional skills. Reflecting on your emotional reactions to a situation or information is as important to the learning process as analyzing data or facts. By encouraging students to comment on their performance and the feedback they receive, students can understand, review and take ownership of their progress (Sargeant et al., 2008).

It can be concluded that diverse understandings of the concept of *reflection* clearly show the complexity of the reflection process, as well as its characteristics in the field of education. Reflection after the teacher's feedback as a learning strategy is a pedagogically structured and guided cognitive process that promotes student learning, aimed at improving learning performance and perfecting the learning process. Reflection allows students to build on their previous experiences, choose and verify the relevance of learning concepts, focus on personal growth, improve research skills and create new experiences.

In **Section 1.4, "Reflection models"**, different reflection learning models and their stages are analysed. Reflection models of Dewey (1933), Kolb (1984), Gibbs (1988), Smyth (1989), Atkins and Murphy (1993) are analysed. Reflection models developed by Jay and Johnson (2002), Boud et al. (2005), and Rolfe et al. (2010) are analysed. Researchers point to the mutual coordination of practical knowledge and their connection in this process. Reflection models developed by Jay and Johnson (2002), Boud et al. (2005), and Rolfe et al. (2010) are analysed. Researchers point to the mutual coordination of practical knowledge and their connection in this process. Theoretical and practical knowledge are two inseparable parts of the cognitive

process: theory allows you to find new ways of practice, and practice, in turn, contributes to the improvement of further action in the future. Thus, at any stage of one's own activity, learning/teaching and reflection, theoretical knowledge base and practical understanding, as well as real-life experience, are always strengthened.

Based on the collected data, it can be concluded that reflection and feedback are closely related processes. Both processes are involved in promoting learning and development, allowing the improvement of skills, knowledge and performance. Reflection helps to self-evaluate, analyse, and evaluate thoughts, actions and experiences. This process involves reflecting on the outcomes, beliefs, values, and goals of action in order to better understand oneself and the situation, thereby helping to understand why an event occurred, as well as how it will affect future action. Feedback, on the other hand, is information, evaluation or feedback received from others about the work done. It can be information received in a formal or informal way about the performance or behaviour provided, which allows becoming aware of one's strengths and weaknesses, as well as to improving one's performance. Reflection is often done using feedback as a basis or starting point. Feedback can provide information about performance or activity that is necessary to reflect on and use as a resource to improve and develop performance. Thus, reflection and feedback are interrelated and can reinforce each other's effectiveness in personal and professional development.

Thus, the author of the Doctoral Thesis developed the model of the student's reflection learning process after the teacher's feedback (Fig. 2).

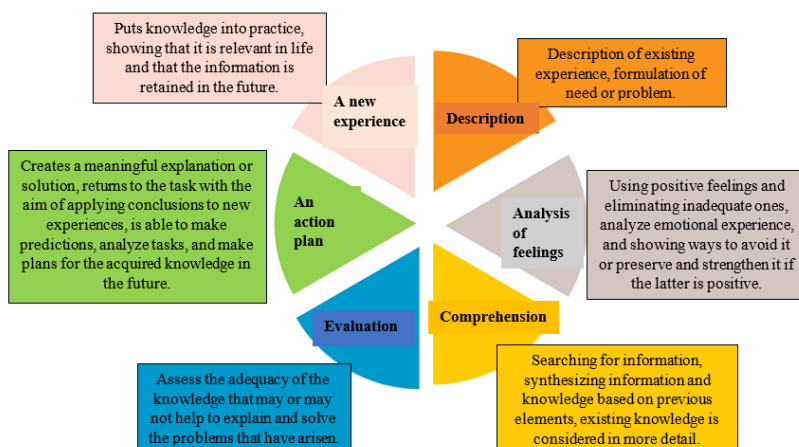


Fig. 2. Model of the student's reflection learning process after providing the teacher's feedback (created by the author).

This model (the model of the student's reflection learning process after providing the teacher's feedback) consists of the description, analysis of feelings, comprehension, evaluation, and action planning, and as a result, new experiences are created. Each stage offers specific directions of action and thought, which, as a result of the acquired knowledge, contribute to the process of personal development, expanding and developing understanding and experience.

1. Experience review is an activity that involves two essential steps. The first of them is the description of the general experience, which provides an opportunity to describe in detail and systematically what happened, pointing to specific events, feelings and reactions, and helps to accurately document and remember important events or situations. The second element is identifying important aspects or identifying needs and problems, which includes identifying the significant factors or issues that were involved in the experience or identifying what needs to be improved or resolved if similar situations occur in the future. Thus, critical thinking and analytical skills are formed, which helps to understand the acquired experience and a certain direction for personal or professional development. Together, these two elements form the basis for reflection and performance improvement and help to understand and use existing experience in the future.
2. Analysis of feelings begins with asking questions about experience. These questions are designed with the goal of gaining a deeper understanding of the given situation or event and thus focus on seeking answers that not only involve understanding the actual events of the experience but also deepen the analysis to include personal thoughts, emotions, and the important contexts that accompany it. It represents a mindset that focuses on deep understanding, where personal reactions, emotions, and surrounding circumstances are taken into account in order to more fully understand an event or situation. Such analysis helps to develop an emotional and intellectual understanding of the experience and discover aspects that can contribute to personal or professional growth.
3. Comprehension is based on a systematic search for information, in-depth reflection of existing knowledge and detailed research. It involves an active interest and desire to understand a topic or question through careful and accurate research and attention to detailed analysis. In order to gain a deeper understanding of the specific topic or question, at this stage, the literature is studied, data is collected and analysed, and the existing knowledge is critically evaluated. Comprehension helps to expand knowledge

and develop skills, creating a basis for further understanding and development in a specific field or topic.

4. Evaluation allows drawing conclusions about existing experience and acquired knowledge, assessing their potential to explain and solve the problems that have arisen. It involves careful and critical analysis of how effectively existing knowledge and experience can be used to address specific situations or problems, which in turn can influence future decisions and actions. In addition, assessment serves as a tool to help create a better picture of how to better use existing knowledge and experience to more effectively solve problems or improve the situation.
5. Action planning includes the ability to accept new perspectives or points of view about a specific situation or activity and to transform it into a new specific behaviour or action, as well as by using new forms of action or approaches to situations, contributing to the formation of new experiences.
6. The new experience offers the opportunity to gain a new understanding of events or situations, which again promotes the reflection process, thus starting a new cycle in which the new behaviour, understanding and results are reflected, thus contributing to the process of continuous development and improvement. Such cyclical thinking is essential to improve behaviour and achieve the desired result in the development process.

The prerequisites for promoting students' reflection in the learning process demonstrate the possibility of systematic use of the mentioned activities, where the main goal is to develop students' knowledge, skills, attitude and ability to act, promoting competency-based learning. It not only promotes interest and motivation to learn and develop throughout life but also develops the ability to comprehensively use the acquired knowledge and skills in solving real-life problems (MK noteikumi Nr. 747). The prerequisites for promoting students' reflection in the learning process are conceptually based on both competency-based learning and the integration of conscious practice. Systematic reflection on feedback is an integral part of the learning process, during which students comprehensively analyse their behaviour and evaluate their contribution to performance outcomes.

Based on the literature analysis, it can be concluded that before giving feedback and during giving feedback, the teacher performs several important actions. The teacher formulates the results to be achieved and finds out how the learning process will help to achieve them, then discusses these goals with the students, ascertaining their compatibility with students' interests.

During the learning process, students look for answers to questions while the teacher guides the process so as not to deviate from the learning goal and plan. The teacher provides feedback to students as often as necessary, asks questions about the preparation and thinking process, and promotes self-assessment and autonomy of students. After completing the task, the teacher asks the students to evaluate their performance, identify strengths and weaknesses, set new tasks, and reflect on the feedback given on the task completion.

In **Section 1.5, “Reflection after providing feedback in the learning process”**, the pedagogical potential of feedback and reflection is emphasized, where the importance of reflection on feedback is characterized by the following essential aspects:

1) reflection encourages students to think about how the feedback affects their performance and how they might use it to improve their performance;

2) reflection on feedback can encourage conscious self-evaluation, for example, by stimulating critical thinking about how a task has been performed, as well as about the new information gained from feedback about what has been done;

3) reflection on feedback helps to improve self-assessment or self-control skills; that is, the self-analytical process necessary for lifelong learning and competence development is improved (Sargeant et al., 2010).

Reflection encourages students to purposefully engage in the thinking process, participate in the cognitive cycle, and form reasoned judgments about the goal (Dewey, 1933; Kolb, 1984; Quinton & Smallbone, 2010). Also, reflection supports learning (Moreno & Mayer, 2005) and offers a critical approach to evaluating feedback comments and solutions to improve performance (Sargeant et al., 2015). Additionally, reflecting on feedback can help students improve their self-directed learning skills and help them understand the criteria for success (Butler & Winne, 1995; Cho & Schunn, 2007; Nicol & Macfarlane-Dick, 2006).

Reflecting on feedback helps to improve performance because it directs the feedback recipient's attention to the task level (Anseel et al., 2009). One of the formal activities that can trigger and structure students' reflection process is asking questions (Seibert, 1999; Seibert & Daudelin, 1999). It has been proven that the teacher helps students by asking questions; thus, the student becomes more actively involved in solving the problem and improves performance (Ge & Land, 2003). By asking questions that move from How? to Why? the problem is clarified, ideas about causes are generated, and action is planned (Seibert & Daudelin, 1999).

Systematic reflection on feedback is an integral part of the learning process, during which students comprehensively analyse their behaviour and evaluate their contribution to

performance outcomes. Researchers Ellis and Davidi (2005) emphasized that for reflection to take place, feedback, self-explanation, data verification and feedback would be provided again. Systematic reflection requires that individuals or teams fully engage in the learning process. Two types of feedback are provided during systematic reflection:

1. Evaluation of performance: absolute/relative success or failure. Such result feedback serves as a motivational trigger for the reflection process, and if feedback reflection is not focused and goal-oriented, then it is not effective (Anseel et al., 2009).

2. The purpose of feedback is to improve the task performance process. Through systematic reflection, the learner is responsible for analysing their own performance data and generating reasons, determining the causes and effects of their learning (DeRue et al., 2012).

It should be noted that students' reflection on feedback provides the necessary information to the teacher: how personalized, meaningful, formative and authentic is the feedback given by teachers on students' work, and does it correspond to procedural and formal feedback (for example, the standard) (Bailey & Garner, 2010).

Based on the literature analysis, it can be concluded that before giving feedback and during giving feedback, the teacher performs several important actions. The teacher formulates the results to be achieved and finds out how the learning process will help to achieve them, then discusses these goals with the students, ascertaining their compatibility with the students' interests. During the learning process, students look for answers to questions while the teacher guides the process so as not to deviate from the learning goal and plan. The teacher provides feedback to students as often as necessary, asks questions about the preparation and thinking process, and promotes self-assessment and autonomy of students. After completing the task, the teacher asks the students to evaluate their performance, identify strengths and weaknesses and set new tasks, reflect on the feedback given on the task completion.

Chapter 2 of the Doctoral Thesis, “Reflection after providing feedback in the learning process – an empirical study”, consists of seven sections. In this chapter the research program and methodology are reflected, the diagnosis of the situation in the assessment of student's knowledge, skills, attitudes and the value of reflection has been made, and pedagogical prerequisites have been identified that ensure the use of students' reflection practice in the learning process, the development and approval of the model of the student's reflection learning process after providing feedback from the educator, as well as the comparison and interpretation of the effects for the students of the main group and the control group of the study.

Section 2.1, “Characteristics and methodology of the empirical research program”, presents research goals and tasks, justified research methods and empirical program.

In **Section 2.2, “Effects of reflection on feedback on student learning and performance improvement”**, the research base is described, and a survey of 6th-grade students with different reflection practices was conducted. In order to obtain as truthful information as possible from the research participants, the anonymity of the research participants was respected. Data was processed using *IBM SPSS Statistics 21.0* predictive analytics and statistical analysis software package.

Summarizing the results of the research, it can be concluded that:

1. Students have an understanding of their role in the learning process and take responsibility for the results of the learning process; however, there is a difference between long-term and short-term responsibility.

2. Students’ interest in learning is mainly promoted by factors directly related to a successful learning process and positive emotions: a successful result of the learning process, positive emotions in the learning process and the influence of parents.

3. Students participate in the learning process and want to improve their performance, which is an important aspect of promoting reflective practice.

4. Students have different experiences and assessments of the effectiveness of teacher feedback in the learning process. The effectiveness of feedback given by the teacher is related to the individual needs of the students and the context.

5. The obtained data shows the need to improve students' reflection practice and develop skills to effectively set and achieve goals, as well as to use the provided feedback more meaningfully in the learning process. The development of such understanding could be essential not only in the individual student’s learning experience but also in the pedagogical process as a whole.

Section 2.3, “Pedagogical insights that ensure the use of students’ reflective practices in the learning process”, reveals the pedagogical prerequisites that ensure the use of students’ reflective practices in the learning process. In order to get an idea of the pedagogical prerequisites, a phenomenological research design was chosen. 44 research participants, who are basic school general education teachers, are involved in the study. The method of inductive content analysis was chosen for qualitative data analysis.

By grouping the codes obtained in the process of open coding, 11 subcategories were created, which, in the process of generalization, were combined into eight general categories – time, plan, teacher-led process, critical thinking, involvement, content, teacher competence, and purpose (Table 1).

The process of generalization into general categories has made it possible to see the pedagogical prerequisites that ensure the use of students' reflective practices in the learning process.

Table 1

Category Generalization Process

Descriptive phrases (codes)/number of them	Category	Generalization
Time / 4	Time	Time
Frequency of reflection / 1	Regularity	
Plan how and what to do / 2	An action plan	Plan
Teacher's explanation, questions / 3	Teacher's help	A teacher-led process
Learning of critical thinking / 5	Critical thinking	Critical thinking
Student engagement in the process / 5	Student engagement	Engagement
A problem/reason to reflect on / 10	Content	Content
Knowledge about a topic / 1	Knowledge	
Teacher's reflective abilities / 3	Teacher's competence	Teacher's competence
Setting different goals / 7	Purposefulness	The aim
Criteria that the student must know / 2	Criteria	

When conducting additional analysis of the codes obtained in the open coding process, the following trends can be seen:

1. Prerequisites related to students' critical thinking, such as students' involvement in the reflection process. To be meaningful, reflection needs to be continuous, connected, challenging and context-based (Eyler et al., 1996). In order to ensure such relevance, it is important that students collect, interpret and analyse their experiences or think critically about the context in the learning process, thereby engaging in a reflective process.
2. Prerequisites related to the teacher – teacher-led process, teacher's competence. Reflection is usually more effective as a guided rather than a solo activity (Sargeant et al., 2015). A teacher who helps the student in the reflection process by asking open-ended questions can guide the student towards a goal. Encouraging the reflection process involves both the cognitive and emotional skills of students. Reflecting on your emotional reactions to a situation or information in the learning process is just as important as reflecting on data or facts. By encouraging students to reflect on their

performance, students can understand, review and take responsibility for their progress (Sargeant et al., 2015).

3. Prerequisites related to both the student and the teacher, such as time planning, goal setting, content research and analysis, and action planning. The process of reflection begins with the identification of a problem and the decision to seek a solution; a plan or decision to act is developed through cognitive activities (Rogers, 2001), where cognitive activities include comparing, analysing, evaluating, questioning, drawing conclusions and planning (Stokking et al., 2004).

It can be concluded that reflection for the research participants is associated with a reflection process led by a teacher who is competent, in which both the teacher and the student set goals, and the student is actively involved in studying specific content, analysing it with the help of critical thinking and planning future action, which shows, that the research participants have both knowledge and experience in reflection because the general and subcategories obtained in the process of generalization reveal what they are based on both concepts, that is, knowledge and learning experience.

In Section 2.4, “Development and approval of the model of the student's reflection learning process after the teacher's feedback”, the development and approbation of the model of the student's reflection learning process after providing feedback has been carried out.

In creating the model, the findings from the analysis of theoretical sources of knowledge have been taken into account that learning begins with raising the need for understanding the problem in society or science (Sargeant et al., 2010), followed by the planning and implementation of a set of actions to be implemented, including teaching methods and resources (Kolb, 1984). However, it must also be recognized that the set of activities included in any teaching approach must be constantly supplemented and improved (Echazarra et al., 2016).

The developed model includes an interconnected description of the reflection method and the sequence of implementation, emphasizes the necessary resources and possible difficulties in the learning process, as well as emphasizes the close connection of the learning content with real life.

While developing the model, the samples of the curriculum of the subjects developed in the elementary school within the project "Competence approach in the curriculum" implemented by the State Educational Content Centre (VISC) have been updated (MK noteikumi Nr. 747, 2018).

The model was tested in the base school. 27 students of the 6th grade of the research-based school were involved in the approbation.

Using the reflective circle of researcher Gibbs (1988) and taking into account the reflective practices of researchers Atkins and Murphy (1993), Jay and Johnson (2002), and Moon (1999), a model of the learning process of student reflection after teacher feedback was developed to encourage students to reflect more structured and systematically (Cottrell, 2003) on the feedback they had received on tests.

Description of the model of the student’s reflection learning process after the teacher’s feedback

Stage 1. Description and discussion of the situation. After completing the test, the teacher evaluates it, assigns a numerical rating and provides written feedback on the student’s performance. In the next lesson, the student receives his test and, after the teacher’s explanation of the student’s next activity and its purpose, discusses the situation (what did the students do?), the task (what tasks were performed in the test?) and the result (what was the achievable result?), see Table 2.

Table 2

The Model of the Student’s Reflection Learning Process After Providing the Teacher’s Feedback – Stage 1

<i>Student activity</i>	<i>The aim of Stage 1</i>	<i>The teacher's questions for the student</i>
Description of the learning situation	To identify the existing experience and needs and formulate the problem	1. What did you do? 2. What tasks were performed? 3. What is the achievable result?

Stage 2. Analysis of feelings. After discussing the situation, students are invited to read the provided feedback and answer the questions. The student writes down the answers in the notebook. The question *How do you feel about the feedback you received?* allows students to focus on the emotional response to the feedback and the associated numerical rating. This question allows the student (Moon, 2002) to identify his positive and/or negative emotions. It captures the immediate response, which is one of the levels of reflection (Surbeck et al., 1991). By identifying their feelings, students separate their emotional responses to feedback from rational thoughts and begin to reflect (Table 3).

Table 3

The Model of the Student's Reflection Learning Process After Providing the
Teacher's Feedback – Stage 2

<i>Student activity</i>	<i>The aim of Stage 2</i>	<i>The teacher's questions for the student</i>
Analysis of feelings	To get acquainted with the received feedback and express emotional reactions.	1. How do you feel about the feedback you received?

Stage 3. Comprehension. The questions *What did you think about this feedback? What did you do well? What could you have done better? What keywords will help you to find the information you need?* encourage students to be analytical. This section of the questions includes the evaluation and analysis of elements of Gibbs' reflective circle (Gibbs, 1988). These questions are asked to allow students to focus on their experiences (Table 4).

Table 4

The Model of the Student's Reflection Learning Process After Providing the
Teacher's Feedback – Stage 3

<i>Student activity</i>	<i>The aim of Stage 3</i>	<i>The teacher's questions for the student</i>
Comprehension	To search for information, synthesise information and insights, and reflect on existing knowledge.	1. What did you think about this feedback? 2. What did you do well? 3. What could you have done better? 4. What keywords will help you to find the information you need?

Stage 4. Evaluation. The third question, based on the feedback given, *What actions could you take to improve your work?* helps to draw conclusions, where the main purpose of reflective practice is to help students understand how they could improve their performance in the future, improve their knowledge and gain a better understanding of the subject to be learned (Moon, 2002). This encourages students to think about specific actions they can take to improve next time's performance (Table 5).

Table 5

The Model of the Student's Reflection Learning Process After Providing the
Teacher's Feedback – Stage 4

<i>Student activity</i>	<i>The aim of Stage 4</i>	<i>The teacher's questions for the student</i>
Evaluation	To assess the adequacy of the knowledge that may or may not help to explain and solve the problems that have arisen.	1. Based on the feedback provided, what steps could you take to improve your work?

Stage 5. An action plan. The student creates a meaningful explanation to the question *What will you do next to improve your performance (specific steps)?* and returns to the task with the aim of applying his conclusions to new experiences, making predictions, analysing the tasks and creating a plan for future actions, which in turn helps to develop learning experiences (Boud et al., 1985) (Table 6).

Table 6

The Model of the Student's Reflection Learning Process After Providing the
Teacher's Feedback – Stage 5

<i>Student activity</i>	<i>The aim of Stage 5</i>	<i>The teacher's questions for the student</i>
An action plan	To create an explanation or solution, make predictions, and analyse tasks	1. What will you do next to improve your performance (specific steps)?

Stage 6. A new experience. Taking notes (answering questions in writing form), the student is forced to think, summarize, conclude, plan and thus get involved. According to the "Competence approach in the curriculum" project implemented by the State Education Content Centre (VISC, 2017), with the help of a teacher, students create their individual learning portfolios, which in turn provide material for the student's personal development plans and put knowledge into practice, thus showing that it is important in life and for the information to be retained in the future (Cottrell, 2003). These portfolios can be a useful resource for teachers, providing real insight into students' learning habits and thus helping the teacher to plan future teaching activities that meet students' interests and needs (Table 7).

Table 7

The Model of the Student's Reflection Learning Process After Providing the
Teacher's Feedback – Stage 6

<i>Student activity</i>	<i>The aim of Stage 6</i>	<i>Teacher activity</i>
A new experience	To put the knowledge into practice, showing that it is relevant and that the information is retained in the future.	Building a portfolio of learning and experience.

The model of the student's reflection learning process after providing the teacher's feedback (Fig. 2, “The model of the student’s reflection learning process after providing the teacher's feedback”, in the Summary of the Doctoral Thesis) was used in the lessons from March 1, 2022, to May 31, 2023, after of each test (there were six tests in total) for which written feedback was provided. A total of 27 student learning portfolios were reviewed to ensure that students had engaged in reflective activities. A content analysis of the content of students' portfolio comments was conducted to identify the most frequently repeated words and phrases that students had used in their reflective comments (Bailey, 1994), as shown in Table 8.

Table 8

Compilation of Students' Reflective Comments

Question	Descriptive phrases, words/number of answers
How do I feel about the feedback I received?	Joyful (35), happy (28), relieved (7), disappointed (4), annoyed (1), overwhelmed (6), motivated (6), excited (17), satisfied (31), worried (8), sad (10), mixed emotions (4), sad (11), normal (25).
What do I think of this feedback?	It is fair (24), helps to understand mistakes (18), useful (31), reasonable (7), normal (27), incomprehensible (4), helps to understand what I still need to learn (19), learned something I had not paid attention to (1), it's OK (21).
Based on the feedback provided, what actions could I take to improve my work?	Learn vocabulary; repeat grammar rules; read the conditions for the task; read the task to the end; read the evaluation criteria; attend consultations to learn; to study not only for the test but study all the time; take into account what the teacher wrote; to ask the teacher and classmates what I did not understand; not to repeat the mistakes made; check what I have written; read the question carefully; read the laws in the notebook, review the completed tasks.
What will I do next to improve my performance (specific steps)?	I will learn vocabulary; I will learn grammar rules; I will carefully read the conditions of the task, follow the evaluation criteria and fulfil all the conditions; I will attend consultations; I will look at the tasks already completed and ask about things I do not understand; after completing the work, I will re-read what I have written; I will do my homework.

The students read the feedback they received, thought about it and answered the questions during the lesson. Thus, it can be concluded that the familiar formal learning environment was

favourable to the thinking process, and the students were actively involved in the reflection process. Students wrote comments in the form of notes or wrote short paragraphs, and when answering the first question, there were students who freely used exclamation marks, emoticons, and symbols, illustrating their involvement in the process and illustrating their feelings.

Answers to the question *How do I feel about the feedback I received?* illustrated students' ability to express their emotions and feelings (Surbeck et al., 1991) before thinking about feedback. Responses such as *shocked*, *relieved*, and *happy* reflect students' level of personal involvement (Browne & Freeman, 2000) and their willingness to write reflective comments on the paper (Yinger & Clark, 1981). Question *What do I think of this feedback?* elicited unbiased comments. Based on these comments, it can be concluded that students are able to distance themselves from their work and reflect on the provided feedback (Higinss et al., 2002).

In response to the question, *Based on the feedback provided, what actions could I take to improve my work?* students demonstrated self-reflection and active learning (Dee Fink, 2007) and were able to identify development needs through comments on the feedback provided. (Dochy et al., 1999; Sadler, 1989).

Analysing the students' portfolios, it can be concluded that not all students found it easy to write down the next steps they should take to improve their performance. This may indicate learning limitations; for example, there are students who may not have the critical ability to reflect on the feedback provided, make written comments and then create a plan for future action. The teacher should address the issue related to the fact that the students do not understand the feedback received and are, therefore, unable to reflect on it. Effective feedback helps students to make connections between their own work and opportunities for further improvement (Black & Wiliam, 2010). Effective feedback is timely (Weaver, 2006), encourages students to become more actively involved in monitoring their own learning (Mutch, 2003), and provides students with tools for future work to move forward (Hounsell et al., 2008).

In **Section 2.5, “Students’ survey on the benefits of the model”**, the most significant benefits and difficulties of using the model of the student's reflection learning process after the teacher's feedback are clarified.

Targeted sampling was implemented in the survey, as all 27 students involved in the model approbation participated in it. An analysis of the quantitative data obtained from the students' answers and a qualitative content analysis of the answer data were carried out: recording of

descriptive phrases (codes), separation of categories, generalization, and comparison of answers (see the results of the content analysis in the justification of the opinion presented in Table 9). Students were also asked to rate the usefulness of the model of the student's reflective learning process according to the stages of teacher feedback on a scale from “1” (not helpful) to “10” (very helpful). It must be recognized that high evaluations were given for all the stages of the student's reflective learning process after the teacher’s feedback (Table 9).

Table 9

Compilation of Students’ Opinions About the Model of the Student’s Reflection Learning Process After the Teacher's Feedback ($N = 27$)

Stages of the model of the student's reflection learning process after the teacher's feedback provision	Average rating for the usefulness of the model stage (from 1 (not useful) to 10 (very useful))	Reasons for the given opinion
Description of the learning situation	8.85	Delving into the content of the tasks (17 replies) Formulating the problem (2 replies) Determining the result to be achieved (8 replies)
Analysis of feelings	8.29	Expressing emotions (26 replies) Listening to myself (1 reply)
Comprehension	7.9	Raising awareness (15 replies) Awareness of strengths and weaknesses (1 reply)
Evaluation	8.9	Expressing an opinion (8 replies) Thinking operations: analysis, synthesis, evaluation (16 replies) Immersive learning (3 replies)
An action plan	8	Developing critical thinking (8 replies) Expressing an opinion (19 replies)
A new experience	8.7	Creating knowledge (23 replies) Immersion in the learning content (4 replies)

Overcoming the difficulties encountered in the learning process is also an important part of the learning process (Sargeant et al., 2008), and as difficulties, students have mentioned a large amount of work (12 answers) and answering questions in writing (11 answers). It must also be acknowledged that two students also mentioned a lack of concentration. Emphasizing the most significant difficulties in the model approval process, students had the opportunity to mention several answer options, but no student used this option: 25 students mentioned one answer option, and two did not mention any – see Table 10 for the most important difficulties.

Table 10

Students' Opinion on the Main Advantages and Difficulties of the Model ($N = 27$)

The main benefits	The most significant difficulties
<ul style="list-style-type: none"> • Development of thinking (12 replies) • Understanding of the topic (6 replies) • Acquisition of knowledge (13 replies) • Improved performance (8 replies) • Creating an action plan (4 replies) • Improving reading skills (1 reply) • Expressing feelings (1 reply) • Improving study skills (4 replies) • Obtaining new information (2 replies) • Cooperation with the teacher (2 replies) 	<ul style="list-style-type: none"> • Answering questions in written form (11 replies) • Large amount of work (12 replies) • Lack of ability to concentrate (2 replies)

The analysed data reveal that it is the acquisition of knowledge and the development of thinking in the process of reflection that is most valued. Thinking skills are needed not only in the learning process but also in real life. This shows the students' understanding of the importance of knowledge and the ability to actively develop thinking skills not only in the learning process but also in real life, and also indicates that knowledge can be useful in different situations and real-life contexts. It is also interesting that directly answering questions in writing is one of the most important difficulties mentioned by students. This points to the challenges students face in using written expression and suggests the need to improve writing skills.

In Section 2.6, “Teacher survey on the benefits of the model”, an analysis of the data obtained as a result of the teachers' survey was carried out in order to find out the most significant benefits and difficulties of using the model of the student's reflection learning process after the teacher's feedback. Twelve teachers who worked in class 6B and approved the model in their classes took part in the survey.

Quantitative data analysis and qualitative content analysis of the responses data were performed: recording of descriptive phrases (codes), separation of categories, generalization, and comparison of answers (see the results of the content analysis in Table 11 for the opinion presented). The teachers were also asked to rate the usefulness of the stages of the reflection process on the feedback on a scale from “1” (not useful) to “10” (very useful).

Table 11

Compilation of Teachers' Opinions About the Model of the Student's Reflection Learning Process After the Teacher's Feedback ($N = 12$)

Stages of the model of the student's reflection learning process after the teacher's feedback	Average rating for the usefulness of the stage of the model (from 1 (not useful) to 10 (very useful))	Reasons for the given opinion
Description of the learning situation	8.16	Discussion about feedback (8 replies) Understanding the context (5 replies) Formulating the problem (10 replies) Delving into the content of the task (12 answers)
Analysis of feelings	7	Identification of emotions (1 reply) The formation of empathy (9 replies) Reaction to emotions (2 replies)
Comprehension	8.9	Promoting comprehension (11 replies) Awareness of strengths and weaknesses (4 replies) Acquisition of new information (3 replies) Connection to the existing knowledge base (7replies)
Evaluation	9	Expressing an objective opinion (1 reply) Thinking operations (analysis, synthesis, evaluation) (11 replies) Learning by immersion (9 replies) Setting criteria and goals (6 replies) Summary of information (3 replies)
An action plan	8.25	Developing critical thinking (8 replies) Expression of opinion (4 replies) Development of conclusions and recommendations (10 replies) Performance analysis (9 replies)
A new experience	8.58	Creating knowledge (8 replies) Immersion in the learning content (7 replies) Engagement and responsibility (12 replies)

In order to evaluate the main benefits of the developed model, the teachers had the opportunity to provide several answer options. In total, teachers have provided 62 answer options. Most respondents have emphasized thinking (12 replies). Teachers emphasize that when reflecting on feedback comments, students analyse information, solve problems, draw conclusions, and make decisions using available knowledge, experience, and skills. Eleven respondents emphasize that students are more actively involved in the learning process (Table 12).

Table 12

Teachers' Opinion on the Main Benefits and Difficulties of the Model of the Student's Reflection Learning Process After the Teacher's Feedback ($N = 12$)

The main benefits	The most significant difficulties
<ul style="list-style-type: none"> • Self-understanding and development (2 replies) • Providing support (3 replies) • Active learning (11 replies) • Calm and conscious behaviour (1 reply) • Cooperation with students (5 replies) • More targeted behaviour (4 replies) • Decision-making (7 replies) • Stress reduction (1 reply) • Thinking (12 replies) 	<ul style="list-style-type: none"> • Time consumption (12 replies) • Information overload (1 reply) • Risk of competition (3 replies)

As difficulties, teachers have mentioned time consumption (12 answers), information overload (11 answers), and competition risk (3 answers) – see Table 11 for the most important difficulties. The analysed data reveal that the performance of activities of providing teacher feedback according to the model of the student's reflection learning process may require a large consumption of time. Too much feedback comments and information can cause overload, which can lead to students missing out on important information and unhealthy competition between students during discussions.

It can be concluded that the use of the model of the student's reflection learning process after the teacher's feedback helps students to learn, evaluate the received information, solve problems and make decisions, thus actively participating in the learning process. This model helps students to understand themselves, their thoughts, emotions and actions, promotes personal development by helping them to understand their strengths and weaknesses, as well as promotes emotional and intellectual growth, allows students to be aware of the consequences of their actions, discover mistakes and make corrections in the future, as well as helps to learn from experience and improve performance. Finally, the reflection process can help students to set and achieve goals and helps to gain a clearer picture of what the student wants to achieve and what actions are needed to achieve it.

In Section 2.7, “**Comparison and interpretation of the influence of the model of the student's reflection learning process after the teacher's feedback for the students of the main group and the control group of the study**”, – the data obtained in the surveys of the respondents of the core group and the control group have been analysed and interpreted, revealing that after the Diagnostic test 1, Test 1 work and introducing the students of the core group to the model of the student's reflection learning process after the stages of providing the

teacher's feedback and their implementation, it can be seen that the core group the level of both knowledge and understanding and skills improves (Table 13). Table 13 shows the average and standard deviations for both groups regarding the learning process and the learning result after the implementation of the approbation model.

Table 13

Mean (*M*) and Standard Deviation (*SD*) of Both Groups on the First Diagnostic Test Task and the First Test Task

		Core group (<i>n</i> = 27)		Control group (<i>n</i> = 50)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Knowledge and comprehension	Diagnostic test 1	4.20	0.57	3.93	0.39
	Test 1	4.70	0.53	3.88	0.35
Skills	Diagnostic test 1	4.63	1.86	4.65	1.63
	Test 1	8.27	2.88	6.60	2.15
A combination of knowledge, comprehension and skills	Diagnostic test 1	8.85	4.24	8.67	2.86
	Test 1	11.85	3.56	9.11	2.39

A repeated measure *ANCOVA* (factor: Diagnostic test 1 and Test 1; between factor: core group vs. control group) revealed a significant effect on the results of Diagnostic task 1, $F(1, 52) = 9.01, p = .004, \eta_p^2 = .15 [d = 0.83]$ and for the results of Test 1, $F(1, 52) = 27.62, p < .001, \eta_p^2 = .35 [d = 1.46]$. In addition, a significant interaction was found between the Diagnostic test and Test 1, $F(1, 52) = 13.40, p < .001, \eta_p^2 = .21 [d = 1.02]$. This interaction indicates that the increase in outcome quality was significantly greater for the core group than for the control group (Fig. 3).

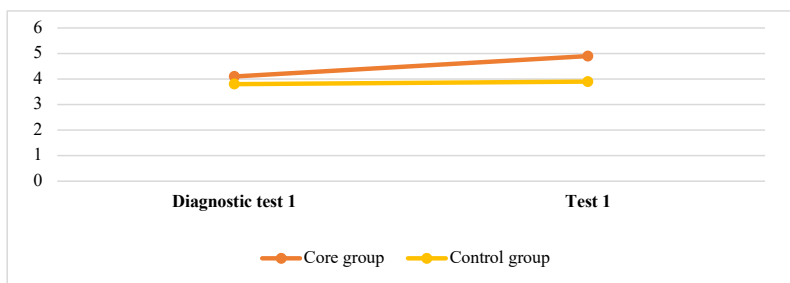


Fig. 3. Interaction between Diagnostic test 1 and Test 1. The error bar represents the standard error of the mean.

The results of all six diagnostic tests and tests were analysed (Table 14, for descriptive statistics). An *ANCOVA* (factor: diagnostic test vs. test; between factor: core group vs. control group) was conducted for each diagnostic test and test. Analysing the interaction between the diagnostic test and the test, it was found that the results of Test 4 are the highest $F(1, 52) = 24.75, p < .001, \eta_p^2 = .32 [d = 1.38]$. No significant differences were found between the other diagnostic tests and the tests: Test 2 $F(1, 52) = 0.57, p = .456, \eta_p^2 = .01 [d = 0.21]$; Test 3 $F(1, 52) = 0.63, p = .430, \eta_p^2 = .01 [d = .22]$; Test 5 $F(1, 52) = 0.66, p = .421, \eta_p^2 = .01 [d = 0.23]$; Test 6 $F(1, 52) = 5.78, p = .020, \eta_p^2 = .10 [d = 0.67]$.

Table 14

Mean (*M*) and Standard Deviation (*SD*) of Both Groups on Diagnostic Tests and Tests

	Core group (<i>n</i> = 27)		Control group (<i>n</i> = 50)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Diagnostic test 1	0.96	0.06	0.97	0.07
Test 1	0.95	0.08	0.94	0.09
Diagnostic test 2	0.94	0.12	0.89	0.19
Test 2	0.99	0.05	0.90	0.17
Diagnostic test 3	0.93	0.07	0.95	0.08
Test 3	0.96	0.07	0.96	0.07
Diagnostic test 4	0.56	0.15	0.57	0.15
Test 4	0.72	0.13	0.49	0.13
Diagnostic test 5	0.45	0.23	0.31	0.15
Test 5	0.63	0.26	0.34	0.14
Diagnostic test 6	0.37	0.28	0.24	0.23
Test 6	0.45	0.29	0.25	0.22

Analysing the data obtained in the diagnostic tests and tests of the core group and the control group of the study, it was revealed that the use of the student reflection learning process model according to the teacher's feedback after the diagnostic tests and tests contributed to the growth of students' knowledge and skills for the students of the core group of study $F(1, 52) = 4.06, p = 0.049, \eta_p^2 = .07 [d = 0.55]$ (Fig. 4).

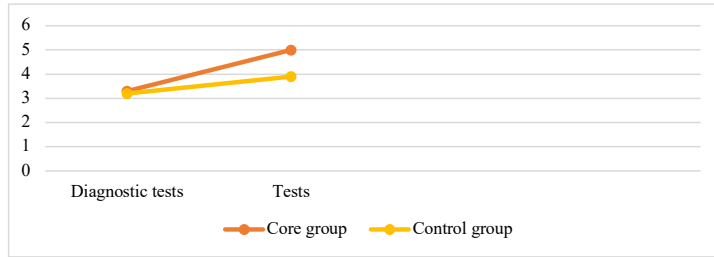


Fig. 4. Interaction between knowledge and skill total scores when analysing diagnostic tests and tests. Error bars represent the standard error of the mean.

It can be concluded that the use of the model of the student’s reflection according to the teacher’s feedback stages contributed to the quality of students’ knowledge, comprehension and skills. The quality of knowledge of the core group increased significantly in subsequent tests. It can be concluded that the reason for the better performance of the core group is that by doing the reflection activities, the students were motivated to think, analyze, conclude and think about what to do next to improve their performance (London, 2003; Wisniewski et al., 2020). Students who received feedback and completed the student reflective learning process model after the teacher’s feedback stages (core group) found it easier to build a foundation to focus on improving their performance (Roelle et al., 2011). The results reveal that the core group’s conceptual knowledge of the reflection process increased; the results show (*ANCOVA* significant; $BF_{01} = 1.01$) that the core group students’ analytical skills were improved, thus the students had the opportunity to engage in a deeper learning process.

CONCLUSIONS

1. The paradigm shift in education, which emphasizes pedagogical activities that promote engagement, collaboration, skill acquisition, feedback and reflection, respecting the student's goals and tasks during the learning process, determines the need to investigate how to provide the student with meaningful and targeted support during the learning process so that learning would be effective in promoting the development of responsibility, knowledge and skills, as well as self-confidence.
2. As sustainable development becomes more and more relevant in society, student-centred pedagogical process and dialogue-oriented learning, especially when answers to all questions are not immediately available, force both students and teachers to continuously think, propose questions and develop diverse ways of thinking, as well as promotes reflection on feedback as an actual strategy that promotes the student's cognitive and metacognitive development.
3. A pedagogically justified and thoughtful learning process can lead to changes that occur as a result of the student's experience and increase the student's ability to improve performance and learning in the future. In this context, the main element of the learning process is the student, who, as a result of learning, sees concepts, ideas and the world differently, and changes in the level of knowledge, attitude or behaviour. Learning outcomes are manifested in testing newly acquired knowledge and skills in real life, reflection, setting new goals, and gaining confidence in one's abilities.
4. The result of the student's learning will become a competence, which by its nature is complex and includes knowledge, skills and attitudes, as well as the need to integrate these individual elements into a coordinated, targeted and responsible action, if the teacher implements a reasonable teaching approach – to plan and create a process which during the course, the student develops the skills to generalize, reflect, transfer the new knowledge and skills to unknown situations, including real-life situations.
5. Feedback is an integral part of the learning process, which the teacher provides both formally and informally. Feedback comments to the student from the teacher ensure that attention is paid specifically to what and how to improve in the future activity. Such feedback practices develop feedback literacy or competence in students, which is necessary to understand information and use it to further improve their individual learning strategies.

6. Reflective practice is a complex process of active thinking linked to action. It is an essential 21st-century skill that is incorporated into the learning process to help students connect theory with practice. The process of reflection helps students to make learning more relevant to their needs, more meaningful and connected to the context.
7. The process of reflection allows students to build on their past experiences and choose and test the validity of their individual learning strategies, focusing on growth and creating new experiences. Students review and check the acquired knowledge, find out its depth and consolidate it. Reflection is effective when the teacher guides the student through the process by asking open-ended questions, thereby engaging students' cognitive and emotional capacities.
8. Reflective teaching can facilitate the creation of a new kind of educational environment in which both teachers and students share equal responsibility for learning outcomes but play different roles. Reflection is teaching (reflective techniques) and a goal (learning and developing the reflective competence of students and teachers), as well as the basis of the relationship between all participants in the educational process.
9. Reflection can bring significant benefits in the educational process: more complete knowledge of students, improvement of teaching approaches, determination of suitable ways of differentiating and individualizing lessons, deeper understanding of the content given to students, determining the optimal ways to develop students' skills, supportive pedagogical relations with students, improvement of assessment approach, optimizing the teacher's teaching style and each student's learning style and indirectly learning outcomes.
10. The results of the empirical research show that in the learning process, students lack time to reflect on what they have learned, on the feedback received, as well as the reluctance of students to get involved in the learning process, which suggests what learning strategies, including reflection, in the context of a student-centred approach, the teacher should choose in order to promote a growth-oriented student's cognitive process, ensuring the student's ability to take responsibility for his own learning, that is, learning the curriculum and using skills, solving real situations and problems.
11. The results of the empirical study emphasize the pedagogical prerequisites that ensure the use of students' reflection practice in the learning process: (I) prerequisites related to students' involvement in the reflection process and critical thinking; (II) prerequisites related to the teacher – teacher-led process, teacher competence; (III) prerequisites

related to both the student and the teacher – time planning, goal setting, content research and analysis, action planning.

12. The results of the empirical research show that in order for the reflection process to take place, it is necessary to set goals and achieve them; the student must actively participate in the process, learning specific content, analysing it, using critical thinking and planning his future actions. A change that teachers can make is to ensure that the reflection process is guided, that the reflection process is regular, and that it is focused on further development. To facilitate the process of reflection, it should be embedded in practices that see learning not as a product to be handed down to students but as a dialogue in which the student can actively engage so that the student understands, revises, and takes responsibility for his or her own progress.
13. Performing the stages of the student reflection learning process model according to the educator's feedback allows students, based on their previous experience, to choose and make sure of the adequacy of the learning strategy, focusing on the student's growth. With the help of the model of the student's reflection learning process, after the teacher's feedback, the students review and check the acquired knowledge, find out its depth and strengthen it, creating a new learning experience.
14. Ensuring quality education requires the cooperation of all parties involved. Competence consists of knowledge, skills and attitudes that result in student performance. In order for the result of the students' learning to be competence, the teacher's skills to lead appropriate learning, analyse, reflect and cooperate, providing the necessary pedagogical support to the student, developing reflection as a learning strategy are actualized.

RECOMMENDATIONS

1. In the learning process, teaching and assessing students at different stages of education, teachers need to take into account the needs and interests of students, emphasizing the success and growth of students in the learning process.
2. Paying attention to students' involvement in feedback comments, teachers and the educational institution, as a learning organization, are recommended to be aware of the pedagogical prerequisites that need attention, including providing students with a support system on a daily basis to motivate students to improve their performance in the learning process. Thus, developing the necessary skills of teachers in order to effectively and timely provide feedback to students about the learning process and teach students to reflect on feedback, thus promoting students' active involvement in the learning process, becomes relevant.
3. In order to contribute to the improvement of the student's learning performance, in the pedagogical process, attention should be paid to what students learn, how they learn and how teachers influence this process so that feedback has special importance in the learning process. The feedback process should include clear goals for students' learning and performance, clarifications on specific criteria for evaluating students' achievements, opportunities for improving students' learning performance and respecting a common understanding of the achievable learning outcomes and the quality of education.
4. In order for students to receive feedback not only as information from the teacher, they should engage in a dialogue about the feedback they receive. In order to engage in the feedback process, students must first respond to the feedback on an emotional level. Paying attention to their involvement is also a way to ensure students' well-being during assessment, which helps to see assessment as an opportunity for growth and self-improvement in the learning process.
5. In order to strengthen the importance of students' active involvement, teachers should create an opportunity to promote learning by linking feedback to the subsequent stages of learning and performance, to reflect on the most frequently made mistakes, on the possibility of transferring the result of their learning to a new cognitive context.

6. In order to achieve the desired goal of the learning process, teachers should identify and understand how students perceive, interact with, respond to feedback, and act upon receiving feedback comments, as the way students emotionally and cognitively engage in reflection on feedback will affect not only their overall learning and growth but also the development of further lifelong learning skills and twenty-first-century competencies.
7. Through the process of reflection, teachers should strengthen and develop the factors that promote and support student learning and should help address those factors that hinder learning. Consequently, students will be provided with an optimal learning experience in which they will perceive the importance of their learning and engage in the learning process.
8. Reflection should be integrated into the entire educational process without separating it from the goals of self-education. The reconstruction of experience is a central as well as an ongoing goal. In order for students to achieve this goal, they must reflect by analysing their values, attitudes and emotions, which in turn transforms understanding, as well as gives new meanings to ideas by connecting them with previous knowledge and acquired information. Reflection, learning from one's experience, encourages one to take responsibility for one's actions and decisions.

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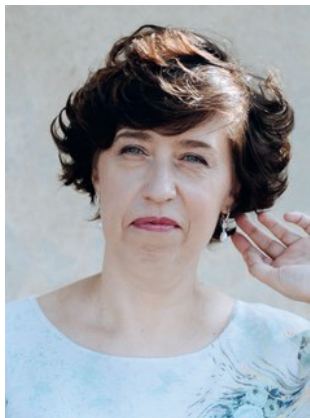
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