Teachers' Experiences in Organizing the Process of Assessment and Self-Assessment of Students in Natural Sciences Lessons

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Abstract. The article analyses the experiences of teachers in organizing assessment and self-assessment processes in natural sciences lessons. In order to compare the teacher's assessment and the student's self-assessment, the study relies on the concept of assessment as learning. The research participants are primary education teachers who organize natural sciences lessons for fourth-grade students. The study is based on the methodology of participatory action research. During the action research, the role of the teacher and the student in achieving the harmony of assessment and self-assessment was revealed, four main stages of the student's self-assessment of the lesson were distinguished as well as the factors promoting and limiting the harmony of assessment and self-assessment. It was emphasized that during the educational process, teachers must constantly monitor students, record individual progress in a chosen way, analyse the results, and discuss them with students. Collaboration with colleagues becomes important, which helps to collect and analyse data, organize joint activities together, discuss results, examine challenges, and recommend solutions.

Keywords. assessment, self-assessment, natural sciences lessons, teachers' experiences.

1.   Introduction

As a result of globalization and the development of the information society, education around the world is undergoing fundamental changes, when educational goals, teaching and learning methods change, at the same time, the assessment of learning outcomes changes – from learning to be assessed to assessment that helps to learn successfully [1]. The strategy of the European education policy is focused on increasing the role of students in assessment processes, hoping that students' "self-assessment will acquire a more dominant status and cover a more significant share (up to 50%) of assessment practices in European classrooms", however, these changes are occurring too slowly, because teachers are still leading many assessment practices (Prospective Report on the Future of Assessment in Primary and Secondary Education, 2020)[2].

Scientific research shows that the biggest barrier to successful involvement in the common learning process for all students is the traditional process, based on standardized learning, the environment of its implementation, the assessment system and tools, when the goal of education is the understanding and learning of the intended knowledge and facts [3],

[4]. According to Boud [5], assessment in the classroom cannot focus solely on the assessment of acquired knowledge and testing of students. Learning is not a simple process of acquiring knowledge, the quality of which could be assessed by simple testing; the approach of assessment as learning, which includes both pedagogical and assessment features, helping to develop students' evaluative decision by clear means, becomes relevant. Students who are only tested and do not receive timely feedback from the teacher on how to improve their work do not achieve a higher level of learning. It is emphasized that if the educational institution does not have a feedback system, it becomes difficult for students to understand the various approaches of teachers (feedback forms, requirements, etc.), which hinder the systematic pursuit of better results [6].

The need for assessment reforms is also expressed in the documents of the European education policy. According to Yan & Yang (2022), assessment can contribute to learning or hinder it. In order for assessment to help the learner learn, it is important to seek connections between learning and assessment, not their separation. In this case, in the context of global learning assessment reforms, assessment-as-learning is understood as a component of learning, a learning strategy, rather than an assessment method [7], where assessment/self-assessment techniques are applied, using which students learn [6].

Research shows that when students self-assess their learning achievements and progress, they become more engaged in the learning process and develop responsibility for their own learning, which significantly improves their achievements [8]. Surveys of teachers conducted at School X (Lithuania) highlighted the problem – insufficient harmony between teachers' assessment and students' self-assessment in the lesson. It was decided to implement the innovation in natural sciences lessons, since the community of the school where the action research was planned has set a priority – the application of modern information technologies in the STEAM process. This obliged to focus on the active role of the student in exploring the surrounding environment and connections with life. Inquiry-based learning as a student-centred process based on a challenge, problem, or question, emphasizes evidence-based reasoning, which is especially relevant in the field of natural sciences education [9]. In order to compare the teacher's assessment and the student's self-assessment, the study relies on the concept of assessment as learning [10]. Such an approach to assessment is a new educational practice, which is extremely rarely applied in general education schools.

The **aim of the research** is to reveal the feedback and self-assessment methods and tools in natural sciences lessons that support the harmony of teachers' assessment and students' self-assessment.

The **object of the research** is the experiences of teachers in organizing assessment and students' self-assessment processes in natural sciences lessons.

The study was carried out in the implementation of the activities of the project "Optimization of the network of higher education institutions and improvement of the quality of studies by merging Siauliai University and Vilnius University" (No. 09.3.1-ESFA-V-738-03-0001) co-financed by the European Union Structural Funds, when cooperation between researchers, students and teachers was sought in conducting research activities and introducing innovations in the educational process. The study is based on the methodology of participatory action research suitable for research in the field of education, emphasizing the liberating (emancipatory) approach. Teachers' involvement in the participatory research helped them and their students to formulate emerging problems and concerns and to envision appropriate processes for solving the problems [11]. The study included teachers who are the **participants**

in the process interested in the quality of education – five primary education teachers who organize natural sciences education for fourth-grade students.

2. Methodology

The **research methods** applied: analysis of scientific literature, role-making mapping method, action research, during which teachers' focus group discussions took place, reflections, content analysis of collected data.

The stage of literature analysis helped to systematize essential theoretical concepts about the understanding of assessment and self-assessment in the modern education system, the factors promoting and limiting their harmony.

The role-making mapping method, which consists of four steps of data collection, and the sequence indicates the logic of data collection, its direction, possible "returns" and adjustments [12], helped at the beginning of the research to reveal the experience of combining assessment and self-assessment in the natural sciences lesson of each research participant (primary education teacher). Four steps of data collection of this method were applied: a list of objects under investigation is made, objects are grouped in terms of significance (ranking), a map is laid out according to the criteria chosen by the researcher, an in-depth interview is conducted – "cumulatively capturing the responsibilities and expectations assigned to the role, their hierarchical organization, individual performance of a role and self-description performing that role" (Juozeliūnienė, 2014, p. 118). In the first step, the spontaneous description and limits of the object under study (management of the system of the assessment of natural sciences lessons and students' self-assessment) were recorded; in the second step, the significance of the listed items for the research participant was determined; in the third step, a map was laid out and thus the relationship between these items and the research participant was visualized (implementation of expectations related to a particular role in organizing natural sciences lessons); in the fourth step, in an in-depth interview, the research participant is asked about the meanings he/she gives to the items on the list and their location on the map.

The participatory action research, which took place over half a year, consisted of two cycles. This action research aimed to practically model the use of assessment as learning in natural sciences lessons to observe how the interaction between the processes of teachers' assessment and students' self-assessment influences the improvement of learning achievements and progress of primary school students. Great attention was paid to promoting the active role of the student in exploring the surrounding environment and connections with life. The four-step model in [13] based on the cyclical nature of action research was chosen. This iterative process was developed through the spiral of self-analysis of planning, action and observation, summarizing and further implementation. In the action research stages, reflexive focus group discussions were held regularly, every 4 weeks (during the period of the action research and after the action research (summarization of the experience gained)), the aim of which was to self-assess the factors promoting and limiting the harmony of the applied systems of assessment and students' self-assessment, to determine the directions for changes, to involve teachers in the continuous management of changes in the system of assessment of natural sciences lessons and student's self-assessment. Focus groups were held in the non-formal education centre of the pro-gymnasium every Tuesday of the month, dedicated to the collegial learning of the pro-gymnasium teachers. The reflections of the teachers and researchers throughout the process were recorded in two types of journals created together with the teachers.

The last stage of the action research was the analysis of the data collected during the study, conclusions, recommendations, preparation of the report, publication of the results.

Qualitative data – the responses provided by the teachers – were analysed using thematic analysis in [14], which is "a method for identifying, analysing, and interpreting patterns of meaning ('themes') within qualitative data" (Clarke & Braun, 2017, p. 297). The smallest units of analysis – codes – provided meaningful answers to the research question. According to the authors, "[c]odes are the building blocks for themes, (larger) patterns of meaning, underpinned by a central organizing concept – a shared core idea" (Clarke & Braun, 2017, p. 297). In thematic analysis, the research question is not fixed and may change during coding and theme development.

The chosen method of thematic analysis helped reveal and explain the teachers' experiences of organizing assessment and self-assessment processes in the natural sciences lesson as a "social reality" [15]. In the study, the thematic analysis is based on a constructivist approach. The constructivist approach was chosen in order to reveal how the transformations of teachers' roles and activities influenced by the innovations implemented in natural sciences lessons are shown in their reflections. The methodology of thematic analysis, based on a realistic approach, emphasizes the experiences of the participants and the meanings assigned to specific phenomena in a real environment, while the constructivist one "explores the impact of various tools and methods, realities, experiences and meanings on the public discourse" (Žydžiūnaitė & Sabaliauskas, 2017, p. 208).

During the entire study, the main ethical principles were observed ([15], [12]): principles of respect for personal privacy; confidentiality and anonymity; benevolence and disposition to do no harm to the subject; justice and free will. Prior to conducting the study, a written permission to conduct the study was obtained from the Committee on Research Ethics of Vilnius University; the aim and objectives of the study were explained to the participants of the study, they were introduced to the course of the action research, data anonymity and confidentiality were ensured; the participants were informed in writing of the right to decide whether or not they agree to participate in the action research.

3. Empirical Results

3.1. Literature Review

The literature review showed that students' learning through the assessment-as-learning approach depends on their "engagement with the assessment task itself as well as the activities associated with it" (Yan & Yang, 2022, p. 1). The goal of assessment as learning is the inclusion and empowerment of the student as a co-creator when the learner himself/herself assesses himself/herself. This kind of assessment trains students to reflect on the learning process, foresee growth prospects and strengthens students' faith in their own strengths [6]. In other words, self-assessment is a fundamental experience of the learner that influences his/her learning. "Self-assessment is regarded as a typical assessment-as-learning activity" (Yan & Yang, 2022, p. 5). It is a learning strategy that students choose to learn by engaging in an assessment task. According to Yan & Yang [7], such learning enables the learner not only to remember and apply knowledge, but by monitoring his/her own performance and responding to learning needs to promote the development of metacognition and self-regulation, the active role of the student in the assessment process is emphasized, since the teacher is no longer the only source of feedback. It was emphasized that although the practice of assessment as learning is common in classrooms, it still lacks a clear theoretical justification [7].

One of the examples of assessment as a learning practice is synchronous self-assessment, when the teacher-led assessment in the classroom is used alongside the student's self-assessment [16]. Such self-assessment increases students' awareness of what their learning

and assessment process is like. The interventional study carried out in Spain by Remesal (2022) with 215 teachers-to-be revealed that synchronous self-assessment is a strong metacognitive factor expressed in the form of self-efficacy, strategic planning, cognitive challenge, and cognitive demand. The study revealed metacognitive, emotional, and evaluative arousal during such episodes of synchronous self-assessment, associated with proactive (orientation towards the expectations of performance) and retrospective (orientation towards actual performance) decision-taking. Proactive decision-taking has been shown to induce metacognitive arousal, while retrospective decision-taking has been shown to induce evaluative arousal. "Both types of decision-taking arouse students emotionally" (Remesal, 2022, p. 228).

The active role of the student in the assessment process is relevant at an international level. For example, New Zealand's assessment policy aims to make the student an active participant in learning and assessment, thus placing a strong emphasis on the development of assessment as a learning practice. In 2009, the Ministry of Education commissioned a report on the definition of assessment policies, which emphasized the imperative to develop students' abilities to assess their own learning [17]. Booth et al. (2022, p. 249-253) conducted an empirical study in which six primary school teachers revealed three conditions necessary for students to become assessment-capable learners: 1. the assessment-capable teacher communicates standards to students so they understand what constitutes quality; 2. the assessment-capable teacher provides meaningful opportunities for students to assess the quality of their work and help them develop the metacognitive skills to engage in this practice; 3. the assessment-capable teacher empowers students to "close the gap" between their current and desired performance.

The results of the research of Booth et al. (2022, p. 254) substantiated that teachers using the practice of assessment as learning should: a) believe that students can and should take responsibility for their own learning; b) plan students' assessment of their work, providing scaffolding, lesson structure and support for students to apply assessment as learning; c) create a culture of learning and involve students in assessment as learning to create conditions for self-regulation; d) ensure a climate of mutual respect in which students feel safe and able to share their ideas and self-evaluation is clear.

3.2. Participatory research using the *role-making mapping method* (viewed as a modification of Levin's *my-family map*), compiled in 2010 by researchers from the Department of Sociology at Vilnius University [12], made it possible to reveal the concept of the participant's role in organizing natural sciences lessons: each teacher presented their experience of assessment and self-assessment in a natural sciences lesson. It was found that each teacher who participated in the study has a different perception of her role in the process of natural sciences education: one teacher pays more attention to scaffolding in natural sciences lessons, when students are offered temporary support tools or educational methods that could help students achieve the intended educational goal [18]; another one – to personalization, when the aim is to respond to the needs of each student in the classroom; the third one – to problem-based teaching, during which emphasis is placed on the student's existing experience, cooperation, monitoring one's own progress and practice; the fourth teacher in the lessons pays more attention to experiential education through research and experiments, when she applies various self-assessment tools in practice to accumulate experience, looks for digital applications that would help students to self-assess their abilities in a more interesting way. The fifth primary education teacher is more focused on imparting knowledge to students using the approach of traditional education.

3.3. Results of the action research

During the first focus group meeting, the focus was on the application of the innovation in lessons. The focus group discussed the modern approach to the organization of natural sciences lessons, that learning should be directed towards encouraging students to be active participants ("to contextualize learning goals based on one's own experience and interests, choose activity methods and tools, reflect on the results"), creating an environment favourable for the cooperation of education participants, offering "scaffolding to overcome possible barriers" (Galkienė et al., 2023, p. 30). It was decided that the action research would follow the approach of Yan & Yang (2022) that:

- assessment must be constructed referring to the perspective of assessment as learning;
- self-assessment is a cyclical learning process during which students, using various tools and methods, referring to predetermined evaluation criteria and feedback information, reflect and make a decision about the strengths and weaknesses of their learning activities and outcomes in order to improve them.

"The main purpose of assessment and self-assessment in the educational process is to help students learn, to create conditions to find out how they learn" (P1).

*"My main goal in the practice of assessment and self-assessment was to change the students' view of **learning as learning for themselves**, not for the teacher or parents. For this, it is necessary to learn to objectively assess yourself and your learning efforts" (P3).*

"Self-assessment is a decision taken by the student about his/her progress and achievements in order to find out his/her strengths and weaknesses" (P2).

The role of the teacher and the student in achieving harmony between assessment and self-assessment has been revealed. The teacher's role is **focused on creating conditions for students' activity and self-assessment**: *"students work in groups, <...> after some time, the groups present their solutions and justify them" (P1)*; encouraging students: *"feedback to encourage further learning, <...> encourage learning from each other" (P5)*. The student's role focuses on the **action and its analysis in the lesson and the prediction of prospects**: *"What work did I do in this lesson? How (in what way) did I study? What can I do differently next time to make the work better?" (P1)*, **expression of responsibility**: *"responsibility for learning, <...> to show what has been learned" (P5)*, **problem-based learning directed at cooperation**: *"students talk over with each other, discuss, learn to analyse and self-assess the work in the lesson, notice successes and failures" (P1)*.

In the first focus group meeting of the action research, which involved five primary education teachers, it was decided to involve the students themselves in the formulation of learning tasks and the development of the assessment criteria, and to use not only the usual self-assessment tools and methods for students' self-assessment, but also to practically test the self-assessment table created by the teachers together with the students.

At the end of the first stage of the action research, a reflection was carried out in the focus group, the effectiveness of the assessment and self-assessment methods and tools used in the natural sciences lessons was evaluated, and at the same time it was decided what would be improved in the second stage of the action research. It was decided that the teacher would encourage students to self-assess in the second stage of the action research; will guide them in formulating learning objectives and monitoring progress; together with the students will formulate assessment criteria and indicators that will help to understand what the children have learned; in collaboration with his/her colleagues, he/she will create an environment where students feel safe and feel free to ask questions, are not afraid to ask if they do not understand or know something; will provide an opportunity to apply theoretical knowledge in practice, to test their abilities, so that students can become confident and competent self-assessors; will

monitor students and help them understand their own learning process, promote the development of metacognitive abilities, together with the IT teacher will create a digital tool for students' self-assessment.

The findings confirmed the insights published in the scientific literature that: 1) self-assessment is a learning strategy that gives the learner the opportunity not only to remember and apply knowledge, but also to promote the development of metacognition and self-regulation by observing his/her own performance and responding to learning needs [7]; 2) the relationship between the teacher and the student is very important to ensure the harmony of the construction of the assessment, as in synchronous assessment [16]; 3) the teacher should create the conditions necessary for the students to become assessment-capable students [17].

Factors limiting the harmony of the teacher's assessment and the student's self-assessment were identified during the action research:

• The **teacher's** improperly chosen methods of organizing education and used tools that do not meet the needs of a certain group of students or a particular student: *"I noticed that students with special educational needs need help in self-assessment, personalization of self-assessment criteria" (P4)*. The teachers have noticed that before the self-assessment, the tasks performed in the digital applications, which provide an assessment with points, have an impact on the self-assessment of the students' performance. Such tasks can significantly reduce the positive self-assessment of one's work in class: *"I realized that this determined their self-esteem, so I will change it the next lesson" (P4)*.

▪ **Students'** lack of skills to carry out self-assessment activities: *"When [students] find information, they often present it with terms that are unfamiliar to them. It is necessary to teach to systematize only the most important moments" (P3); "Some students lack objectivity when evaluating friends (e.g., are unable to distance themselves from a relationship with a friend)" (P4); "Usually, students want their points to be "erased" so that their previous achievements are not visible. Their previous experience is sometimes not very pleasant for students" (P2); "I noticed that the students overestimated themselves and we decided that the self-assessment needed to be corrected" (P4); "For some students, it is easier to reflect, for others it is more difficult. The aim is for students to express their insights and reflections more in the lesson" (P3)*.

The teachers have noticed that it is necessary to change the assessment practice. *"The traffic light reflection method works. Such work of students is difficult to assess" (P5)*. The change in the assessment practice is focused on the pursuit of success: *"Problem → success" (P5)*.

All the teachers who participated in the action research emphasized the importance of assessment based on success criteria:

"Criterion-referenced (self-)assessment is especially popular in the classroom, it is understandable and acceptable to children, because the criteria are discussed with them. Then it is clear to the children what and why will be assessed, guidelines for future assessment are formed" (P5).

"<…> students are introduced to the assessment criteria before completing the task, the criteria are planned by discussing together what, how and when we will assess. If the task requires it, students take the criteria into account when doing their homework as well. Students, while preparing for the task, reflect on whether the learning outcomes will be achieved or whether they will meet the objective of the lesson" (P4).

"When performing a particular task and assessing progress, it is important that the student knows what to pay attention to, know, and be able to do, and in order to complete the

tasks, it is often necessary to divide them into separate parts. In order to monitor the progress itself, it is necessary to identify success criteria and assess the quality of task performance" (P3).

During the action research, four main stages of the student's self-assessment of the lesson were distinguished:

a) formulation of the learning objective at the beginning of the lesson, associated with success criteria;

b) selection and purposeful application of teaching methods that help students to actively learn, control, structure, develop, deepen understanding of information and ideas;

c) feedback that is specific, timely, and growth-promoting, based on the use of methods and digital tools that ensure a balance between assessment and self-assessment, and

d) the student's self-assessment, timely and systematic, encouraging to improve one's performance, emotional, formative, based on the practical application of self-assessment methods.

Various methods are used in self-assessment: free-form reflections, structured questions, various graphic forms, digital environments and applications, etc. The self-assessment of the process uses: self-assessments of the achievement of specific goals; comprehension check; tasks for self-control and metacognition; writing reflection journals, "world knowledge learning diaries". The self-assessment of the result uses: self-assessment of the rubric or checklist; self-testing; open criticism of one's own work. The teachers-practitioners said that the "Assessment of Assessment" method worked, helping to achieve the quality of assessment by assessing how students managed to assess each other. Assessing the student's personal growth is helped by the "What I Can Be" method, which includes all the components of the learning process, starting with self-knowledge, the appropriateness of the tasks set and the action plan, and the student's own self-assessment. The method "Assessment of Completed Work in Pairs" connects self-assessment with assessment. In the work groups, the method "Sharing the Pie" was actively used for self-assessment, and for the assessment of other groups the "Assessment According to Criteria" was used.

In natural sciences lessons, assessment and self-assessment of inquiry-based competencies are emphasized. The focus is not on the repetition of facts, but on the expression of metacognitive abilities and the practical application of knowledge. The teachers participating in the study tested the innovations with students of different grades, conducting integrated lessons. *"During the experiments, [the students] could explore all the materials, <...> when we calculated everything, we practically tested everything by making cocktails and tasting them"* (P4).

The teachers who participated in the action research emphasized that it is very important to measure each student's growth and learning achievements compared to the requirements provided for in the general programmes, and use the results, as stated by Galkienė et al. [4], for the analysis of students' individual progress. It has been observed that when organizing a lesson using the "Flipped Classroom" method, it helps to activate the students to ask questions, when students can independently collect information on a certain topic from various sources, and in the classroom, work is done with already available information – its analysis is carried out. One of the main sources of learning and the desired progress is the active performance of the learners themselves (when new experience, knowledge and abilities are created through cooperation). It was emphasized that cooperation between students in conducting experiments, analysing educational materials, sharing experiences, discussing, and talking over is also an important source of students' learning and a huge potential for their learning.

4. Conclusions

The analysis of literature sources showed that the assessment emphasized in the modern school is understood as a complex part of learning, the aim of which is the inclusion and empowerment of the student as a co-creator, meanwhile self-assessment is a learning strategy that students choose to learn to make decisions about their progress and achievements in order to find out their strengths and weaknesses. It is emphasized that how the learner assesses himself/herself is very important in the assessment process. Self-assessment promotes the student's self-esteem and motivation, improves critical thinking skills, analyses individual progress, anticipates further educational expectations, and develops lifelong learning competencies.

During the research, the role of the teacher and the student in achieving harmony between assessment and self-assessment was revealed: the teacher's role is more focused on creating the conditions for students' activity and self-assessment, and the student's role is more focused on the activity and its analysis in the lesson, as well as the prediction of prospects, the expression of responsibility and problem-based learning aimed at cooperation. All the teachers who participated in the action research emphasized the importance of assessment based on success criteria, distinguished not only the limiting factors of the teacher's assessment and student's self-assessment, but also four main stages of the student's self-assessment of the lesson (formulation of the learning objective; selection and purposeful application of training methods; feedback and self-assessment), during which teachers actively use various assessment and self-assessment methods and tools.

In natural sciences lessons, assessment and self-assessment of inquiry-based competencies are emphasized, where the focus is not on the repetition of facts, but on the expression of metacognitive abilities and the practical application of knowledge. It was emphasized that during the educational process, teachers must constantly monitor students, record their individual progress in a chosen way, analyse the outcomes, and discuss them with students. Referring to the results of the discussion, the steps for improving learning and achievements must be planned on the basis of the agreements between the student and the teacher. This is where collaboration with colleagues becomes very important, which helps to collect and analyse data, organize joint activities together, discuss results, examine challenges, and recommend solutions.

References
[1]   A. EMELJANOVAS, L. TRINKŪNIENĖ: Mokinių požiūris į pažangos ir pasiekimų vertinimą kūno kultūros pamokose [Progress and achievements in physical education lessons from students' viewpoint]. *Filosofija. Sociologija [Philosophy. Sociology]*, 4, 466-475, 2011.
[2]   S. GIESECKE, L. LASSNIGG, M. STEINER, D. SCHARTINGER, K. H. LEITNER, S. VOGTENHUBER & R. KALCIK: *Prospective Report on the Future of Social Innovation in Education. Executive Summary*. 2020. Retrieved from: https://irihs.ihs.ac.at/id/eprint/5572/7/steiner-lassnigg-vogtenhuber-et-al-2020-future-of-social-innovation-in-education.pdf
[3]   A. GALKIENĖ, O. MONKEVIČIENĖ: Preconditions of transforming the educational process by applying inclusive education strategies: theoretical background. In Improving *Inclusive Education through Universal Design for Learning* (pp. 1–21). Springer, Cham, 2021. https://link. springer.com/book/10.1007/978-3-030- 80658-3.
[4]   A. GALKIENĖ et al. (ed.): *Universalaus dizaino mokymuisi gairės: mokymosi kelias kiekvienam ir kiekvienai [Guidelines for Universal Design for Learning: A Learning Path for*

Everyone]. Vilnius: Europos socialinio fondo agentūra [European Social Fund Agency], 2023.
[5] D. BOUD: Assessment-as-learning for the development of students' evaluative judgement. In Z. Yan, & L. Yang (Eds.) *Assessment as learning: Maximising opportunities for student learning and achievement* (pp. 25-37). London and New York: Routledge, 2022.
[6] A. KAZLAUSKIENĖ, R. GAUČAITĖ (ed.): *Formuojamasis vertinimas – individualiai pažangai skatinti. [Formative assessment for achievement and progress]*. Metodinė priemonė [Methodological tool]. Vilnius: Švietimo aprūpinimo centras [Centre for Educational Supplies], 2018.
[7] Z. YAN, & L. YANG: Assessment-as-learning in the global assessment reforms. In Z. Yan, & L. Yang (Eds.) *Assessment as learning: Maximising opportunities for student learning and achievement* (pp. 1-7). London and New York: Routledge, 2022.
[8] D. WILLIAM: *Mokytis padedantis vertinimas [Assessment for Learning]*. Vilnius: Eugrimas, 2020.
[9] G. E. NOLLMEYER, & K. A. Baldwin: *Inquiry-based Learning: Definition, History, and Frameworks*. Routledge, 2022. https://doi.org/10.4324/9780367198459-REPRW34-1
[10] L. M. EARL: *Assessment as learning: Using classroom assessment to maximize student learning*. Thousand Oaks, Ca: Corwin, 2003.
[11] S. JACOBS: The Use of Participatory Action Research within Education – Benefits to Stakeholders. *World Journal of Education*, *6*(3), 48-55, 2016.
[12] I. JUOZELIŪNIENĖ: *Žemėlapių metodai vaizdu grįstame tyrime. [Mapping methods in Image-based Research]*. Monografija. [Monograph]. Vilnius: Vilniaus universiteto leidykla [Vilnius University Press], 2014.
[13] S. KEMMIS & R. McTAGGART: Participatory action research, in N. K. Denzin & Y. S. Lincoln (Eds), *Handbook of Qualitative Research* (2nd Ed., pp. 559–604). Thousand Oaks CA: Sage, 2000.
[14] V. CLARKE, & V. BRAUN: Thematic analysis. *The Journal of Positive Psychology*, 12(3), 297–298, 2017. https://doi.org/10.1080/17439760.2016.1262613
[15] V. ŽYDŽIŪNAITĖ, S. SABALIAUSKAS: *Kokybiniai tyrimai. Principai ir metodai [Qualitative research. Principles and methods]*. Vilnius: Vaga, 2017.
[16] A. REMESAL: Synchronous self-assessment: Assessment from the other side of the mirror. In Z. Yan, & L. Yang (Eds.) *Assessment as learning: Maximising opportunities for student learning and achievement* (pp. 217-231). London and New York: Routledge, 2022.
[17] B. Booth, M. F. Hill & H. Dixon: Supporting students to use assessment-as-learning. In Z. Yan, & L. Yang (Eds.) *Assessment as Learning: Maximising Opportunities for Student Learning and Achievement* (pp. 244-256). London and New York: Routledge, 2022.
[18] B. S. MEIER, & K. A. ROSSI: Removing instructional barriers with UDL. *Kappa Delta Pi Record*, 56(2), 82-88, 2020.