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USAGE OF DIGITAL LEARNING TOOLS TO ENGAGE PRIMARY SCHOOL STUDENTS IN LEARNING

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ABSTRACT

The article focuses on the usage of digital learning tools by primary school teachers in order to enhance student engagement in learning. Based on the data obtained in the focus groups of educators teaching at primary school, ways to identify and enhance student engagement in learning through digital learning tools were identified. The analysis of the research data proved that the use of the said tools enhanced students' cognitive, emotional and behavioural engagement in learning. To this end, teachers reconstructed common educational practices, anticipated the hindrances to engagement caused by digital technologies and the ways to overcome them, exploited the opportunities provided by digital learning tools, and applied effective means to ensure classroom management and interaction between students. To conclude, the enhancement of learners' engagement in learning required effective teaching and learning strategies, innovative methods, and apt and value-based organisation of the educational process.

Keywords: *digital learning tools, engagement in learning, innovative teaching strategies, primary school students, types of engagement*

Introduction

Over the past two decades, researchers and professionals of technologies have advanced considerably in developing educational technologies that enhance student engagement in learning. Elements for engagement have come to the attention of developers for several reasons: engagement is a prerequisite for meaningful learning, and it includes emotional, cognitive, and social abilities which are learning goals in themselves (D'Mello, 2021; Griffiths et al., 2012). Meanwhile, low engagement results not only in lower academic achievement, but also in decreased interest in learning, behavioural problems, increased exhaustion, absenteeism, or even dropout.

Technologies affect student engagement, because digital technologies, content, and methods are intertwined and cannot be considered in isolation

(Cheung & Slavin, 2013). Koehler et al. (2014) present a tripartite knowledge system of technological pedagogical content that outlines the kind of knowledge needed for effective integration of technologies into educational practice. First, the knowledge of technological content covers a system of technologies and the knowledge of an academic subject. Second, the knowledge of pedagogical content is related to the knowledge of how certain topics or problems are organised, represented, and adapted to the interests and abilities of learners. Third, technological pedagogical knowledge implies an understanding of how technologies can limit or, conversely, deepen learning. The knowledge of the technological pedagogical content means the knowledge of the links between technologies, pedagogy, and content that enables teachers to develop appropriate teaching strategies. For the educational process to be effective, teachers need to have a systematic understanding of the content, education, and technology interactions.

Although game-based and attractive experience of working with digital technologies is engaging, it does not guarantee that students will learn anything meaningful (D'Mello, 2021). The usage of technologies should be evaluated from a pedagogical perspective, focusing not on how much and what, but on when and why (Kurvinen et al., 2020). Most digital learning technologies designed to evaluate and enhance sustainable engagement have been tested in research laboratories, however, there is lack of research in real educational situations on the subject of how and under what conditions these technologies are applied (D'Mello, 2021). The aim of the current research is to identify ways in which primary school teachers use digital learning tools to enhance student engagement in learning.

Digital tools as a factor of enhancing engagement in learning

The development and implementation of digital tools is an evolving and promising area of educational technologies. An intelligent use of technologies for teaching and learning purposes can help students address the problems of communication, belonging to a group, and self-confidence (OECD, 2016). Digital learning increases students' motivation to learn, encourages their development of personal learning strategies, enables them to take responsibility and control their own learning, and helps identify what students need to do to achieve learning goals (Dehler et al., 2011; Papamitsiou & Economides, 2015; Davis et al., 2018; Kurvinen et al., 2020). Van Leeuwen et al. (2021) argue that digital learning tools allow for the application of collaborative learning ideas in virtual learning environments and help students and their peers solve relevant problems.

The opportunities offered by digital learning tools provide an effective way to enhance student engagement and to measure it. D'Mello (2021) distinguishes two groups of digital technologies in this regard: proactive and

reactive. Proactive digital learning technologies with their game-based tasks have been designed to encourage engagement and learning. Such systems aim to increase interest, curiosity, and exploration (Gibson et al., 2015; Plass, Homer & Kinzer, 2015). Well-designed educational games turn learning into a game through presenting challenges, encouraging the search for creative solutions, and proposing surprises. Reactive digital learning technologies have been developed to automatically evaluate student engagement and respond when engagement declines, or to give motivational feedback when engagement is high (D'Mello & Graesser, 2015). Reactive methods are more complex than proactive ones, as the level of engagement is constantly monitored, its decline is observed, and ways are chosen to enhance it. More effective digital tools are those that provide feedback and the opportunities of choice as well as create the preconditions for learning in accordance with one's skills and interests (Baziukė et al., 2022).

The concept of student engagement in learning

Enhancing student engagement in learning is one of the most important goals of teaching and learning (Hadzigeorgiou, 2016; Hadzigeorgiou & Schulz, 2014). Engagement is defined as the time and energy that learners invest in educational target practice (Kuh et al., 2008) and a high level of interest expressed in behavioural, cognitive, and emotional categories (Fredricks et al., 2004). Engagement can also be described as a set of elements of concentration, inner interest, interactivity, perceived control and choice, motivation, and functionality (O'Brien & Toms, 2008). According to Harris (2008), engagement is characterised by a) participation in class activities and adherence to school rules, b) interest in school processes and satisfaction with participation in them; c) motivated and confident participation in school activities, d) meaningful learning to achieve one's goals; and (e) acceptance and evaluation of learning.

Researchers present different engagement schemes. Fredricks et al. (2004) identify behavioural, emotional, and cognitive aspects. Behavioural engagement occurs when a learner engages in academic, social, and extracurricular activities. Emotional engagement is observed when a student feels positive emotions about school, teachers, peers, and learning. Cognitive engagement is demonstrated by student's focus on learning on a strategic and self-regulatory basis. Gresalfi & Barab (2011) describe four types of engagement: procedural, conceptual, consequential, and critical. Procedural engagement takes place through participation in activities that require supervision and attention. Conceptual engagement involves the study of the structure of concepts or objects. Consistent engagement is described as a thorough search for a solution and its implementation. Critical engagement is manifested in the analysis and evaluation of objects, phenomena, procedures, and

the results of activities. The nature of the engagement may vary depending on the specifics of the activity or task, its place in the curriculum, and the variables of individual students or their groups. In order to enhance student engagement in learning, it is important to recognise the nature of engagement and to understand which aspects of engagement dominate or should be encouraged. The task of the teacher is to ensure the expression of all levels of engagement and to reduce the impact of factors that minimise it.

Scientific literature features a number of studies on how classroom management, symbolic awards, effective instructions, interactive teaching, and effective planning can influence engagement (Good & Brophy, 2003; Kauchak & Eggen, 2003; DuPaul & Stoner, 2003; City et al., 2009). The key issue of the current research is the kind of teaching practices used to enhance the engagement of primary school students through the usage of digital learning platforms and the ways of their usage.

Methodology

One of the challenges in researching student engagement in learning is a wide variety of approaches to engagement and research tools. Sinatra et al. (2015) present a three-component research model of engagement in learning: *a person-centred perspective,* concentrating on the analysis of the cognitive, emotional, and motivational states of the student and the indicators of student engagement in teaching; *a context-oriented perspective*, focusing not on individual students but on educational situations and the classroom or school contexts; and *an interaction perspective* dealing with the learner-context interactions in order to identify the relationship between classroom processes and learning outcomes as well as between teaching practices and learner engagement. In the current research, a context-oriented perspective has been chosen, with researchers focusing on teacher activities aimed to enhance student engagement through digital tools.

The research was carried out as part of the project "Artificial intelligence in schools: scenarios for the development of learning analytics in the modernization of general education in Lithuania." A total of 43 teachers participated in the project. This study focuses on the experiences of primary school teachers. Twelve teachers from eleven schools with experience in this field were invited to participate in the study. All the respondents were women with more than 10 years of teaching experience.

Data collection and analysis

The focus group has been chosen as the main data collection method, that is, a semi-guided small-group conversation to understand and explain the meanings, beliefs, and experiences that affect individuals' feelings,

attitudes, and behaviours (Morgan & Scannell, 1998; Nyumba et al., 2018). In order to ensure the involvement of all the participants in the discussion, two sessions of meetings with the respondent teachers were held, each with six primary school teachers. The discussion followed a five-step focus group course: the introductory part, the introductory question, transition questions, essential questions, summarisation, and conclusion (Morgan & Scannell, 1998). The teachers were asked: 1) to share their experiences of the usage of digital learning tools; 2) to describe the digital learning tools used; 2) to provide examples of student engagement in learning and teacher actions to enhance their engagement. The teachers were encouraged to talk to each other and comment on each other's experiences. The researchers played the role of moderator.

The focus group discussions took place on the Zoom platform, each lasting for one and a half hours. The meeting was recorded using the Zoom platform tools. After each meeting, the recording was listened to, and the most important research topic-related moments were transcribed. The total volume of the transcripts is 915 words.

To process the research data, qualitative content analysis was used which helped to cover the obtained information, to divide the data into groups and categories, and to draw conclusions on that basis. The sequence of a three-step data analysis was used (Nyumba et al., 2018). In the first stage, the transcripts were read and annotated, and in the second stage, the initial encoding of the data was carried out, involving the generation of categories without limitation of their number. In the final (focused encoding) stage, the encoding categories identified in the second stage were combined, paying attention to recurring ideas and topics emerging in different groups.

Research results

The analysis of the focus group data proved that the teachers perceived all the three types of student engagement in learning. *Behavioural engagement* was revealed through the students' use of digital learning tools over a long period of time. The teachers pointed out that, after the bell had rung, almost all the students continued to work, reluctantly withdrawing from the computers. In quite a few cases, they had discussions among themselves or with the teacher on how and when they will continue completing tasks at home. *Emotional engagement* was observed when the students were motivated and emotionally responsive to the usage of digital learning tools. During the lesson, interjections *yes, hurray, that's a good one* accompanying the successful completion of the task were often heard in the class. *Cognitive engagement* was recorded by the teachers through

observing how the students performed tasks in the classroom. According to the research participants, technologies in the classroom allowed the students to get a deeper understanding of the topics they were interested in and to collaborate. The teachers also acknowledged that the predominance of a certain type of engagement depended on the topic of the lesson, the students' experience in performing such tasks, the specifics of the digital learning tool, and the form in which the task was performed.

According to the research participants, it would be wrong to believe that the usage of digital learning tools left teachers with nothing to do. In the process of learning, a variety of challenges are faced that have to be anticipated and addressed before they become a hindrance to engaging in learning. It is necessary to assess the physical environment of the classroom in advance. Thus, for example, when the classroom is small and the layout of computers is inconvenient and prevents students from concentrating on their tasks, the level of engagement in learning will be low. The teacher's ability to ensure the smooth use of technology is also relevant: each student ought to have a computer or a tablet, a stable Internet connection, and a smooth connection to the tool. The teacher must also be able to plan the lesson time in accordance with the set goals. The research participants argued that students were more involved in learning through the usage of digital technologies. However, there was also more frustration when the lesson failed to achieve the desired goals and there was not enough time to complete the tasks.

Ensuring interaction between students and creating a learning-friendly psychological atmosphere in the classroom is also important. According to the teachers who participated in the research, the relationships between students and the general atmosphere in the classroom influenced both the engagement of individual students and the willingness of the whole class to learn. Students' relationships with their peers in the classroom contributed not only to a positive learning environment in the classroom, but also to student engagement in learning. If teachers do not anticipate how and in what situations their students can share ideas or comment on each other's work, then students' comments or remarks cause some chaos. It is important for the teacher to identify trouble spots as well as to anticipate potential problems and the ways to solve them.

One of the strategies used by teachers to help solve communication problems is to organise work in pairs or groups. The teachers provided examples of how communication and support could effectively enhance engagement in learning through matching learners together in pairs or small groups. The most common way is to pair off more and less experienced pupils. When a student feels competent in relation to a peer in a particular subject area, he or she experiences a sense of self-pride. The teachers noticed that students

themselves were more likely to ask their peers rather than the teacher for help. Therefore, the teachers applied this strategy when assigning tasks that required cooperation.

Student engagement decreases when the learning material is irrelevant or unrelated to them. When tasks are too difficult or too easy, or take a very long time to complete, planning skills are required. In such cases, a student can participate in the lesson without delving into the subject. Not all digital learning tools allow the teacher to develop or supplement teaching materials. The creative nature of the tasks enables students both to choose the level of difficulty of the task completion and also to generate new ideas, to link the existing and newly acquired knowledge, to look at a topic or problem from different perspectives, and to use different ways of presenting information (speaking, writing a text, creating a soundtrack, selecting illustrations). The multimodal and creative nature of learning increases students' activity and their interest in learning.

Conclusions and discussion

The role of teacher in enhancing student engagement in learning through digital learning tools is not fundamentally different from that in traditional teaching. Technologies do not free teachers up; they only change the nature of their work. The focus group discussions revealed that the teacher's communication style, academic or emotional support, expectations regarding students' learning success, enthusiasm for educational innovations, and openness to innovation were important factors for engagement in learning. No less important is the role of the teacher in planning and organising teaching and learning. In supporting engagement, teachers rethink their mainstream educational practices, the hindrances to engagement caused by digital technologies and the ways to overcome them, they exploit the potential of digital learning tools and apply effective ways to manage the classroom and interact with students.

The research participants confirmed that, while working in the classroom, they noticed students' apparent cognitive, emotional, and behavioural engagement in learning. At the same time, however, they found that such engagement was not automatic, driven by the educational or technological solutions of the used digital learning tools. The findings of other researchers suggested that the use of digital learning tools could be either effective means or it could have little effect on student engagement in learning, especially when the focus was on the most obvious indicators of engagement (Fredricks & McColskey, 2012).

Enhancing student engagement in learning requires new teaching and learning strategies, innovative methods, and intelligent and value-based

organisation of the educational process, so that each student could develop self-confidence and succeed in and out of school. Both teachers and students exposed to digital learning tools *a priori* expect the usage of technology to guarantee a high level of engagement (Davis et al., 2018). Our research has proved that technologies can enhance student engagement, however, the engagement can be merely superficial, based on instant interest. In addition, despite the many advantages, the potential side effects of using digital learning tools, such as the ineffectiveness of passive learning strategies and the limitations of communication and collaboration with others, need to be evaluated (Stahl et al., 2006).

To encourage deep and lasting engagement, education theory and practice need to be rethought. This requires research to analyse the factors that enhance the usage of digital learning tools and the engagement of students from a wide range of different perspectives: the application of specific digital technologies, the teaching and learning of students of different age, the engagement of learners with different skills and interests, and the challenges faced and their overcoming. Synergies between interdisciplinary research are needed. The development and use of digital educational technologies, the generation and implementation of innovative teaching strategies, and research into student engagement in learning should be carried out interactively so that we would be able to describe educational processes as an effective and innovative area of human life and creativity responsive to the challenges of the 21st century.

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