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LEARNING STRATEGIES OF CONTEMPORARY ADOLESCENTS AND A NEW TEACHER TRAINING SYSTEM

Abstract

On the basis of the research conducted at the Department of Media and Information Technology, it has been established that currently cognitive preferences of students are focused on the use of short, dynamic forms of multimedia communication. Unfortunately, the development and provision of new materials on the educational platform have not brought satisfactory learning outcomes. This has been caused by learning strategies developed independently by Internet users. These activities significantly increase the pace of work and reduce the time spent on learning. In the long term, however, they cause gaps in students' knowledge and make them fall behind. Moreover, students' creativity disappears. Therefore, countermeasures should be taken in relation to teacher training and creating concepts for general and vocational education at all levels. This study analyses the assumptions of the educational system in terms of the possibility of appropriate education using ICT.

Keywords: learning strategies, teacher training, educational process, cognitive preferences, short multimedia messages, e-learning, educational film, YouTube Analytics.

Introduction

At the University of Zielona Góra, the Department of Media and Information Technology, offers courses part of which are multimedia online classes. This solution enables teachers to register and control the time in which their students use specific content both at home and in class.

The main elements of the courses are didactic videos made by the lecturers and published on YouTube. This solution enables very easy uploading of video materials on educational platforms. Its basic advantage, however, is the possibility of using YouTube Analytics, i.e. an advanced system for monitoring audience

behaviour. The “Audience Retention” report is particularly important, offering two graphs: relative and absolute audience retention. In both cases, the tool allows one to simultaneously track the content of the video and the vertical axis moving along the graph of the audience retention. This helps to correlate specific content with audience retention. The parameter, defined as the absolute audience retention, informs what percentage of the total number of the video views is the viewing of individual fragments. If the absolute audience retention graph is flattened, one can use a more sensitive solution: the relative audience retention. It informs about the level of audience retention determined on the basis of the activity of the recipients of a given video in comparison with all YouTube videos of similar length. This solution helps to determine whether there was content that diversified the attention level.

The research conducted in the years 2008-2014 and the reports on changes in cognitive preferences of young Internet users (Microsoft Canada, 2015; N. Carr, 2013; M. Spitzer, 2015) show that young people prefer short multimedia messages as forms of communication. This concept should be understood as pieces of music and videos that last a few minutes as well as memes (a single image or a short comic with a concise commentary) placed within hypertext structures (J. Jędryczkowski, 2014; 2016). Despite the fact that since 2008 teaching materials have been developed in the form preferred by students, no significant improvement in learning outcomes has been found. The optimization of applied solutions has not affected the situation. The problem of low effectiveness of learning theoretical content remained unexplained. In the academic year 2018/19 an attempt was made to explain this situation, assuming that a generation of young Internet users had developed their own learning strategies.

Learning strategies of Internet users

Learning strategies are the learner’s intentional activities aimed at facilitating the acquisition and processing of information. It is a general concept that refers to the use of cognitive and metacognitive strategies. Cognitive strategies are activities and thoughts that make information easier to be encoded and retrieved from memory. Metacognitive strategies are procedures used to plan, monitor and regulate the individual’s thought processes. In school practice, the acquisition of declarative knowledge is carried out through the strategies of repetition, elaboration and organization. Procedural knowledge is acquired as a result of recognising and classifying patterns, generalising, differentiating, and remembering the sequence of activities (M.H. Dembo, 1997, pp. 93-124; E. Filipiak, 2012, p. 72).

Multimedia courses used by students are aimed at shaping declarative and procedural knowledge. It has been observed that young people omit parts of the material containing theoretical content (J. Jędryczkowski, 2019). This is due to the new uses of smartphones and computers as well as the constant rush that electronic

media force on individuals. Students, who are able to find any information in a few seconds, treat smartphones and computers as extensions of their own memory, eliminating the need to remember (M. Spitzer, 2015, pp. 18-20). Unfortunately, this approach makes students lack some knowledge and fall behind. In consequence, they are unable to absorb and understand new information.

Analysing the dates on which students used multimedia courses in the academic year 2017/18, it has been observed that nearly half (49%) of the students did not study systematically. They studied for tests and exams only a day before (J. Jędrzykowski, 2019).

As for procedure learning, very low results of practical tests were found. This happened when the students were supposed to observe and practice procedure sequences at home (J. Jędrzykowski, 2016, pp. 15-20). Assigning homework turned out to be the optimal solution to this problem. The only way to do homework correctly was to watch and put into practice the sequence of procedures. Very short practical tests were used to verify whether the students had done homework on their own (J. Jędrzykowski, 2018, pp. 34-38).

However, in the academic year 2018/19 some worrying patterns were observed. When viewing multimedia teaching materials containing a theoretical part (that shapes declarative knowledge) and a practical part (that shapes procedural knowledge), the theoretical part was almost always omitted. The phenomenon was undesirable, because the theoretical part indicated the purpose of practical activities and discussed other often very wide applications of the presented procedures. As a result of skipping the theory, the students carried out their own projects in a reproductive way. They did not look for other applications of the procedures they had learnt, and their works were copies of the didactic materials.

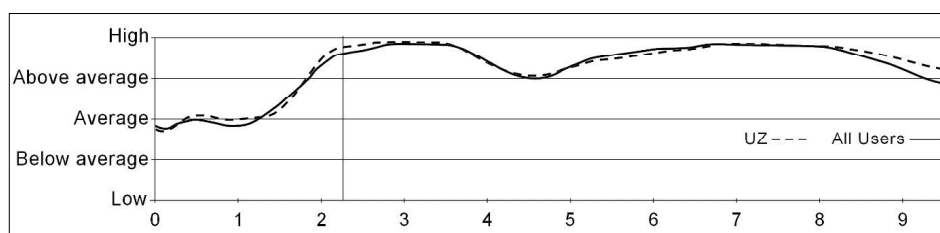


Figure 1. Relative audience retention when using a didactic video

Source: developed by the author.

The graph of the relative audience retention for a didactic video (Figure 1) is an example how the theory part in multimedia educational messages is omitted. The video, which lasted 9 minutes and 34 seconds, presented issues regarding the construction of electronic surveys. YouTube users viewed it 7664 times and

watched it for 307 hours. These values also included the activity of students of the University of Zielona Góra (UZ), who in the summer term 2018/19 viewed the film 338 times and watched it for 17 hours. Their task was to watch the video material and prepare their own projects based on it.

Slight differences between the two graphs show the uniformity of the studied population, which allows one to generalise on the learning strategies of Internet users. Low values of audience retention (section between 0:00 to 2:16) correspond to the theory content of the video. The rest of the video presents the sequence of procedures, which corresponds to a clear increase in the audience retention.

The manifestation of new learning strategies applied by Internet users is the ability to quickly find and skip repeated content. This is demonstrated by the drop in audience retention between the fourth and fifth minutes. At that time, the previously learned procedure was again presented. Although it was shown in a different context, the students immediately noticed analogies.

The main goal of the research was, however, an attempt to explain how the learners were able to give correct answers to questions related to the content presented in the omitted part of the video. It was assumed that new cognitive competencies that enabled the students to gather information after looking through the learning material played an important role in it. This would be possible mainly due to the use of speed reading techniques. (G. Pfeifer, 2013, pp. 74-75). However, these strategies do not seem sufficient in the case of multimedia materials containing: animated diagrams, charts and graphs as well as definitions with a teacher's commentary. Scrolling or having a glance at this type of material is not enough to understand the content of the message.

Explaining how students constructed declarative knowledge without viewing the theory parts of the video involved the use of the observation method. Data was collected in two ways: implicitly using Big Data (YouTube Analytics) and audience retention graphs, and using explicit participant observation. YouTube Analytics graphs provided information on how often viewers interacted with the video content, but they did not show the order in which the video sections were viewed.

It was observed that the students started their work by scrolling the video material. Virtually everyone skipped the theoretical part, which was placed at the beginning of the video. After finding the practical part, the students did not start work, they just continued scrolling until they found the part presenting the final effect of the work. The students watched this section with interest. After familiarizing themselves with the final effect, the students returned to the point where the presentation of the procedures began. Watching the subsequent procedures the students repeated them, doing their own projects. Only very few of them were not copies of the presented solutions.

Based on the observations, an attempt has been made to explain at least partial knowledge of the theoretical issues omitted while viewing. It has been found

that young people, by using dynamic multimedia messages throughout their lives, have developed new learning strategies. They consciously avoid extensive theoretical content reconstructing declarative knowledge through the analysis of the sequence of procedures. The goal of practical activities discussed in the theoretical part is reconstructed by familiarizing first with the final result of practical activities. They formulate rules, definitions and theorems on their own, observing the order and correctness of the presented sequence of procedures.

These abilities show unusual adaptation to the use of digital information sources. Unfortunately, the declarative knowledge obtained in this way is fragmentary. In the light of the research results, special attention should be given to the role of teachers in the teaching-learning process. Their task should primarily involve directing the learning process, including the identification of appropriate learning strategies. A thorough verification of the knowledge of theoretical content, which should take place before starting practical activities, seems particularly important. In addition to expanding the scope of declarative knowledge constructed by students, it can also stimulate creative inventiveness during the implementation of practical tasks.

Teacher training system

An interesting issue is whether the education system in Poland takes into account changes in preferences and learning strategies of children and adolescents. This applies to both teacher preparation and general and vocational education concepts at all levels.

The education reform initiated by the Ministry of National Education in 2016 with a nationwide debate on education titled *Pupil. Parent. Teacher – a good change*, modified the Polish education system. The transformations, that are still taking place, are of a multi-faceted nature and refer to the structure of education in Poland, directions of education development, organisation of psychological and pedagogical assistance, as well as activities connected with educational and vocational counselling. The authors of the reform found it necessary to modernise the teacher training system based on generally available comprehensive development support for schools (N. Stępień-Lampa, 2017, pp. 45-56).

Educational law has changed the structure of Polish schools. The changes covered all educational levels. Education in primary schools was extended to eight years, and junior high schools operating until 2019 were closed. As a result of the changes, vocational secondary schools have been replaced by two-stage vocational schools. A new form of vocational education has also been introduced into the education system – vocational qualification courses (so-called KKZ) (A. Wesołowska, A. Pfeiffer, 2013). They enable obtaining or supplementing professional qualifications. The idea of vocational qualification courses is part of the Lifelong Learning

Programme (G. Klimowicz, 2007, pp. 39-43). It includes the process of developing key competencies in the form of knowledge, skills and attitudes necessary for efficient functioning in the information society (M. Ponikowska, 2013).

The emerging educational system required undertaking activities related to the development and implementation of new core curricula. In 2016, the first works began on proposals for changes in the general education core curriculum in individual types of schools. The current core curriculum reflects the key goals and objectives of education reform, including¹: (1) greater emphasis on the development of key competencies; (2) strengthening the effectiveness of native language teaching by introducing students to the cultural and literary tradition; (3) enhancing the effectiveness of foreign language education; (4) returning to teaching history throughout the entire learning cycle; (5) developing entrepreneurship and creativity, and improving skills in the efficient use of information and communication technologies not only in the education process, but also in everyday life, which will be supported by a broader inclusion of all ICT subjects and programming into the curriculum; (6) developing knowledge and skills in mathematics and natural sciences by introducing biology, chemistry, physics and geography at the second educational stage with continuation at the third educational stage; (7) return to the spiral (incremental) layout of teaching content/educational requirements; (8) replacement of the idea of subject integration by subject correlation (within humanities and science).

The curriculum development is defined by the guidelines of the state's educational policy. Under Article 60 of the *Education Law*, the Minister of National Education sets the priorities for educational activities for a given school year. The main directions of the state education policy in the 2019/2020 school year include the following areas²: (1) addiction prevention in schools and educational institutions; (2) education to values by shaping civic and patriotic attitudes; (3) implementation of the new core curriculum for general education in primary and secondary schools; (4) development of students' mathematical competence; (5) development of creativity, entrepreneurship and digital competencies in students, including the safe and purposeful use of information and communication technologies in the implementation of the general education curriculum; (6) creating a course offer in vocational education and implementing new core curricula for vocational education.

Both the provisions contained in the current core curriculum and the priorities set by the Ministry of National Education emphasise the importance of acquiring social competencies, such as communication and cooperation in a group, work in virtual environments, participation in team and individual projects, project

¹ Cf.: New core curriculum, <https://podstawaprogramowa.pl/> [1.09.2019].

² Cf.: Podstawowe kierunki realizacji polityki oświatowej państwa w roku szkolnym 2019/2020, <https://www.gov.pl/web/edukacja/podstawowe-kierunki-realizacji-polityki-oswiatowej-panstwa-w-roku-szkolnym-20192020> [1.09.2019].

management, for the development of young people and their successes in adult life. In addition, the authors of the reform draw attention to the enormity of on-going civilisation and technology changes. They emphasise the fact that students live in the most stimulating and intense period of world development, and the new technologies among which they have to function, create appropriate conditions for introducing innovative forms of education (M. Wieczorek-Tomaszewska, 2013, pp. 5-47). In the digitization era, an important challenge is also to create educational models that can be implemented in school practice, and which help to increase the effectiveness and attractiveness of the teaching process. These models are largely based on the concept of learning by experience, the optimal use of ICT tools and multimedia Internet resources, constituting the basis for shaping effective learning strategies.

The use of digital resources is to help the student prepare for functioning in the modern world. It enables the creation of a personal learning environment that favours the acquisition of knowledge and the development of key skills. In achieving these goals, it is useful to promote blended learning that combines distance learning with traditional teaching methods. The dynamic significance of blogodidactics, video didactics, webquest methods and e-portfolio is a manifestation of the growing importance of this form of education (D. Hofman-Kozłowska, 2013, pp. 52-76).

New educational challenges force teachers to improve their methodological and digital competencies. The teacher's fundamental competencies related to the organisation of educational classes should correlate with skills connected with various forms of teaching (e.g. blended learning, e-learning, m-learning). Teachers are also required to use online materials and tools and to be able to design them on their own. They should be able to organise the lesson process in a traditional and virtual environment, using various types of educational platforms (M. Plebańska, A. Tarkowski, 2016).

The current system of the teacher training meets the needs of shaping digital competencies. An example of this is the Centre for Education Development in Warsaw. It is a nationwide public teacher training institution run by the Minister of National Education. The idea of the Centre is to undertake and implement actions for improving the education system and raising the quality of education in accordance with the state's education policy. The activities of the Centre relate to general, special, vocational and lifelong education. The Centre runs numerous government programmes focused on the development of the educational environment. These include: (1) Development of instruments for conducting psychological and pedagogical diagnosis. (2) Effective educational and vocational counselling for children, adolescents and adults. (3) Partnership for vocational training. (4) Support for local government staff in education management. (5) Developing models for training and supporting management of the education system. (6) Creating curricula as well as lesson and class scenarios included in sets of educational

tools supporting the process of general education in terms of key competencies of students necessary to navigate the labour market. As part of these activities, teachers are encouraged to use modern content, tools and resources (including ICT) to support general education. Works take place in thematic blocks, taking into account creativity, innovativeness as well as an individualised approach to the student. (7) Training instructors for the implementation of educational and vocational counselling trainings. (8) Creating e-teaching materials for general education focused on: increasing the use of ICT in subject teaching, developing digital competencies, individualising the teaching process, implementing teamwork. (9) Supporting the creation of practice schools. (10) Development of a training and counselling model for the needs of a student with special educational needs (M. Hajdukiewicz, J. Wysocka, 2015).

The added value of the initiatives conducted by the Centre are methodological materials made available on the Centre website. These resources are published and distributed under a free Creative Commons – Attribution – Non-Commercial (CC-BY-NC) license. These include: practice school materials, a bank of good practices in the area of assisting schools in development, descriptions of innovative activities and curricula.

Summing up the changes taking place in the Polish school, it is worth emphasising that the developing digital education facilitates change in the teaching paradigm. It supports the way of thinking about the teaching-learning process in which the student is the creator of their own educational resources, and school is a learning environment.

Conclusion

The child growing up in the multimedia world shapes their cognitive preferences that are focused on the use of short multimedia messages as the primary source of information. For the first time in history the cognitive apparatus of the generation of teachers differs significantly from that of students.

In this situation, proper teacher preparation is extremely important. It should include competencies that regard the use and implementation of multimedia teaching aids. Unfortunately, the use of new media does not guarantee satisfactory results in the teaching-learning process. This is due to learning strategies developed by students themselves. They significantly increase the pace of work and reduce the time spent on learning. However, their effectiveness is apparent. In the longer term, they make students lack parts of knowledge and fall behind. In addition, students' creativity disappear. In this situation, a special role is played by the teacher who, by implementing effective learning strategies, enables students to build complete declarative and contextual knowledge. Only then the transfer of knowledge, that

is the use of acquired information and skills in new situations, may occur. And this is a prerequisite for all creative activities.

The assumptions of the education reform and the consistent implementation of the education policy are conducive to the proper preparation of teachers and create a number of opportunities for encouraging children and adolescents to use digital sources of information effectively.

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