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THE IMPACT OF THE DIGITAL CURRICULUM ON STUDENTS' LEARNING

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Abstract

The paper is focused on the use of an auxiliary digital instrument by primary school children, which acts as a complementary tool for the students' learning both at school and at home. It is oriented on providing an extensive set of learning experiences for the students, as well as relevant contents for the competences taken under scrutiny. However, more emphasis is placed on the set of learning experiences than on the contents, thus allowing the students to be active in their learning adventure. This digital instrument offers the teachers the much sought-after visibility of their students' learning since it allows one to observe not only the final results, but also the number of attempts made by the students. As for the students, it creates the opportunity to adjust the learning's pace according to their own rhythm and style, to use the digital instrument whenever and wherever thought convenient and to allow the complete understanding of the contents, requirements and goals (facilitated by the re-attempt option). Thus, it allows an orderly and flexible solving behaviour. Even though it is presented mainly as an independent learning activity, it is intended to complete the group or pair learning experiences at school and to ascertain each student's progress for the specific competences' attainment. The qualitative analysis employed for the closed scrutiny of the research's results is considered to have raise the value of the case study and to offer a truthful image of the impact the digital curriculum may have on the students' learning.

Keywords: Digital curriculum, active learning, Moodle, competences.

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1. Introduction

Today's reality is marked by the digitalization phenomenon. Therefore, the concern about its impact upon the educational sector apart from being understandable, is also seen as necessary. When analysing the digitalization's impact on education, multiple phases begin to unfold. The first one concerns the state of awareness of the technology's use in education. More precisely, the fact that the teachers use a myriad of available digital resources for their classes proves that the new technologies constitute facilitating elements for the attainment of the goals prescribed by the normative documents in effect. The second one refers to the definition of the digital curriculum concept and the understanding of its complex nature. Thus, it is seen not only as the large number of electronic resources used for teaching, learning and assessing, but also as all the learning experiences that are in close connection with the use of technology. The third phase implies the identification of the present generation's characteristics and the attempt to offer its representatives an instruction that is in compliance with their particularities, interests, necessities and aspirations. The last phase, relevant for the present paper, concerns closely examining the possibilities to optimize the instruction by using the technology in such a way as the produced learning to be useful both in the present and in the future.

2. Problem Statement

More than ever, learning nowadays has to be extremely up-to-date and flexible. Only in this way can it prove to be relevant for solving the problems encountered throughout life and for properly responding to the challenges of today's society. Since today's education in Romania, as well as in the EU, is centred on the attainment of competences, it is extremely important for this key concept to be correctly understood. The competence is defined by the "Official Journal of the European Union" (2006/962/EC) as "a combination of knowledge, skills and attitudes appropriate to the context"; furthermore, it is meant to be both "multifunctional and transferable" (Legea Educației Naționale p.1, 2011). Intended to be useful throughout different aspects of everyday life, it may also be regarded as "a consistent, operative system in which [its] components interrelate in the best possible ways so as to properly respond to similar, yet different situations which enables the person to adequately respond to different situations" (Micu, 2017, p. 216).

Assuming that the aims of education are understood correctly and in order to develop adaptable solving patterns and to emphasize the importance of thinking and doing when learning, the use of a digital curriculum for school learning appears to be the answer. Since the use of technology appears to play a crucial role in nowadays' learning, the present paper is concerned with identifying the impact of the digital curriculum on the attitude towards learning and on the specific mechanisms of school learning. For reaching this goal, the use of a digital instrument complementary to school and home learning and especially developed for offering a learning space favourable for practising the skills and attitudes dimensions of some competences for the subject matter Personal development was considered to be fit. Thus, the teleological orientation of the research is adjusted by specific competences "3.1. The attainment of a daily programme of activities, with the help of the adults" and "3.2. The presentation of the conditions that make learning easy or difficult" set by the Romanian curriculum for the subject matter "Personal development". By means of Moodle Cloud it was possible to design an online teaching-learning-assessing environment fit for the

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particularities of today's generation and to gather the necessary data for analysing the impact of the digital platform of the overall learning.

The choice for Moodle was made first of all due to the software's popularity and availability worldwide since it is "an open-source learning management system, (…) available free of charge to anybody under the terms of the General Public License" (Chung & Ackerman, 2015, p. 217). Also, other reasons for choosing to use Moodle is the fact that "it provides a set of tools and resources that allow course providers to create online courses, post materials such as course outlines and resources for participants, create assignments for participants to post their work, conduct online quizzes, monitor student performance, and communicate with students through forums and threaded discussions (Cole & Foster, 2008; Moodle, 2013 cited in Daniel, 2013, pp. 64- 65). Due to all these features and in the light of the interest shown by today's generation for using the digital technology, the use of an open-source learning management system for implementing a digital curriculum appears to be a wonderful possibility for ensuring the efficiency and effectiveness of the process of learning due to the open, flexible and interactive nature of the available digital instruments.

The digital curriculum is to be understood as a manner in which "digital teaching materials [are provided] to schools and home via the internet" (Scanlon & Buckingham, 2003, p. 192) giving both the students and the teachers the possibility to extend and enrich their cognitive horizons. In the light of this definition, the digitalization of education is seen in the more and more intense use of different sources of information, the possibility to disseminate ideas worldwide, the shift from the traditional forms of learning to new ones such as blended learning, flipped classrooms, gamification, m-learning and so on. If so, then it is everyone's responsibility to ensure that the present-day education unfolds in such a way as to accommodate the new tendencies and to create a safe and orderly learning space that brings forth the advantages of this digitalization process in education.

The first presumption that requires our attention is the fact that education is an ongoing project and it has always mirrored the political, economic and technological reality, being the main instrument of different groups of interests (Khan, 2015). It has been a source of power, which if it is used properly can help people develop and thrive. Throughout the world there is proof that people trust education, the first sign being the desire of adults to ensure well-informed and prepared future generations. Seen as a manner in which the traditions and the values considered necessary for the overall evolution of society are passed down to the future generations, education has always been considered important for the present and future society. Moreover, it "has been conceived as a means to better the lot of our children rather than our own lot; it is almost a universal belief that children should have a better educational opportunity than their parents" (Bruner, 1999, p. 74). Thus, it appears clear that education is not only a legacy, but also an opportunity to improve our existence, to relate to present and future issues and bring forth the best results possible.

However, at times education has displayed certain flaws that impeded the students' full development and their right of freedom of expression. At the present time, these are seen in the over standardization of education. This may be the reason why today's reality claims "the rethinking of the way in which schools operate" (Robinson & Aronica, 2015, p. 17) and the need to put value on the individual traits and help children develop them at full potential. More than ever, it has become important to raise the awareness concerning the fact that all people are different and that these differences may not constitute hindrances,

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but rather potentialities. Therefore, education needs to be made compatible with the present reality, to adapt to the different learning styles and rhythms of students (Khan, 2015), to accept and use at full potential the multiple intelligences of learners (Gardner, 2007), to prepare them for finding innovative solutions to a vast array of problems (Webb, 2007). Also, it is of utmost importance to make it possible for each student to express one's individuality, imagination and creativity (Robinson & Aronica, 2015, p. 20). Thus, in order to be long-lasting and to contribute to the overall development of each individual and of the society, learning has to be meaningful and satisfactory for the students. The way it which this can be achieved is by implementing an active learning approach, in which students should "intellectually engage with the content and not [just] passively receive information, (…) be socially active in the classroom (…) through partner work, small group activities, group projects and whole class discussions" (Edwards, 2017, p. 2) and even be allowed physical movement which would facilitate their involvement in learning.

Last, but certainly not least it is necessary to accept the fact that each generation has its particularities. Whether they refer to a preference towards certain activities or to specific ways of approaching an issue, it is important to realise that it is all guided by important events happening throughout their stages of development. This is why, today's generation, known as digital natives, displays a certain number of traits such as: extreme curiosity, openness to contractions and to new experiences, global orientation, sociability, impulsivity concerning doing whatever they can to solve the problems encountered (Pânișoară, 2017, pp. 45-46), cognitive and sensorial multitasking, easiness in jumping from an idea to another and in making unusual connections between ideas (Ceobanu, 2016, p. 14). All these particularities should be considered whenever formal and non-formal instruction occurs, because it is thought that only in this way can today's education become compatible with the present reality and be relevant to the youngsters it moulds.

3. Research Questions

Intended to analyse the impact of the digital curriculum on students' learning, this research attempts to provide satisfactory answers to the following questions:

- Is it possible for students in primary school to use Moodle for studying outside school?
- Is it effective for their learning (as adjusted by the competences set by the formal curriculum)?
- Is it offering them the chance to study according to their temporal availability?
- Can such learning experiences focus on the ability-attitude dimensions of some competences for the subject matter "Personal development"?
- Does such a tool allow the students to learn according to their individual learning profile?

4. Purpose of the Study

The present study has as main purpose the analysis of the digital curriculum's impact on the attitude towards learning and on the specific mechanisms of school learning. Thus, it implies offering students learning experiences via an electronic device, experiences that contribute to the attainment of two competences for the subject matter "Personal development". By means of the learning activities especially designed and delivered to students with the help of the digital learning platform Moodle, it was intended to

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measure the effectiveness and efficacy of this instrument as far as the attainment of the set competences is concerned, as well as to offer data about the level of attractivity and usefulness of such a tool for the learners.

5. Research Methods

The research methods used were the case study and the activity products' analysis. By using the case study, it was possible to obtain relevant and consistent data which would enable the fulfilment of the research's purpose. The activity products' analysis has facilitated the detailed analysis for the data obtained concerning both the products and the process of learning.

The study was unfolded on fifteen primary school students from ten different schools in Romania. Due to the fact that the present study was concerned with the effect that this digital instrument has on students' learning, it was considered suitable to use it for students that come from different classes and whose school activity is coordinated by different teachers. Therefore, it was possible to analyse the overall efficiency of this instrument without being limited to a single didactic style within a single classroom.

The programme used for ensuring the students' access to a form of digital curriculum is the learning platform MoodleCloud, whose popularity is recognized worldwide. The access to this learning platform was granted by the administrator based on a valid e-mail address. Due to the fact that the subjects of the research are underaged, the e-mail addresses used were those of their parents and in this way the consent for their children's participation in the research was obtained. Also, it was a chance for the school-family relation to be not only highlighted, but also sustained by the use of this digital learning instrument. The learning platform offers the users access to two texts and seventeen tasks which have the role of ensuring the attainment of two competences for the subject matter "Personal development". These two competences were chosen because they were considered fit for forming and developing the metacognitive abilities of students and for their contribution for lifelong learning. More precisely, they concern the knowledge, skills and attitudes concerning the organization of a personal schedule and the management of the external and internal factor of learning in such a way as to facilitate it and develop a pro-learning behaviour.

6. Findings

In order for further results to be obtained, the first issue was getting the primary school children to access the learning platform and use it for its intended purpose. In this way, the digital instrument would become a complementary tool for home and school learning. Mainly designed to be used for being first accessed at home and then furtherly explored at school, the learning tasks involved reading two texts and then solving a number of related assignments for each one of them. Written in the form of two short stories, the two texts contained in condensed form all the necessary information for the knowledge dimension of the two chosen competences. Thus, the users had at their disposal everything necessary for the correct solving of the related tasks. By means of this manner of presenting the information, it was attempted to make the students understand that they need to withdraw information from a text and use it for further discussions, sometimes without directly being made aware by these possible connections.

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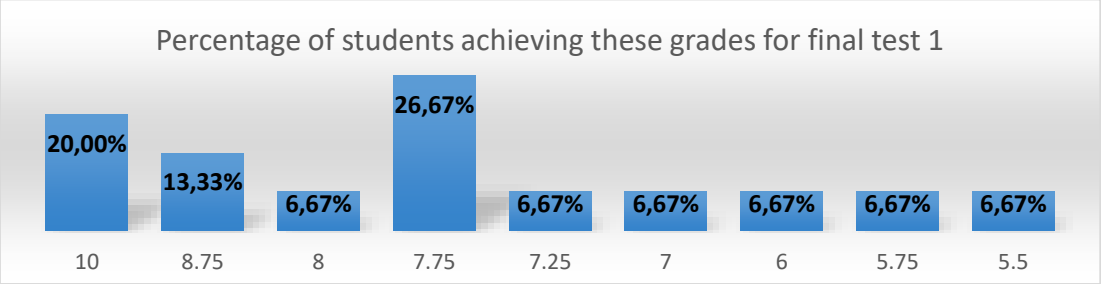

Figure 01. Percentage of students achieving these grades for final test 1

The final test 1 (Figure 01) was designed to verify the level of knowledge for the competence "3.1. The attainment of a daily programme of activities, with the help of the adults". According to the results obtained it is clear that this dimension of the competence needs further improvement since only 40% of the students managed to obtain grades above 8. Therefore, open discussions in the classroom and further tasks involving the knowledge dimension may prove useful for those users who achieved low grades at this test. Even though the users could re-attempt the test, in this case the option was not used by any of them. This may be due to the fact that the students were not accustomed to this manner of work and that they needed more time to adjust to this type of learning.

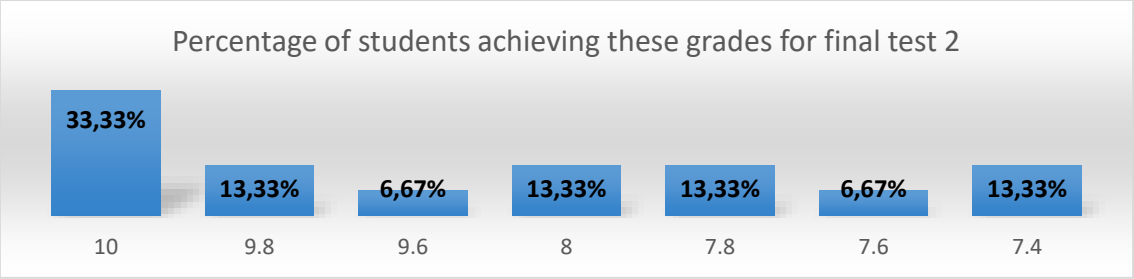

Figure 02. Percentage of students achieving these grades for final test 2

For the second final test (Figure 02) verifying the knowledge level for the competence "3.2. The presentation of the conditions that make learning easy or difficult", the result obtained reveal substantial improvements. Thus, 66,66% of the students managed to obtain results above 8. One reason may be the fact that the users got accustomed to these type of learning assignments and perhaps paid more attention to the text that they had to read before beginning to solve the tasks given for this competence. Another one, may have to do with the importance generally given to the conditions that facilitate learning rather than to those for a well-balanced daily programme. For this test, there were three re-attempts made prior to submitting the final answers, two of which were from the same user. This proves that the users paid more attention to the tasks and to their answering options and that this type of assignments may help student adapt to new manners of approaching learning.

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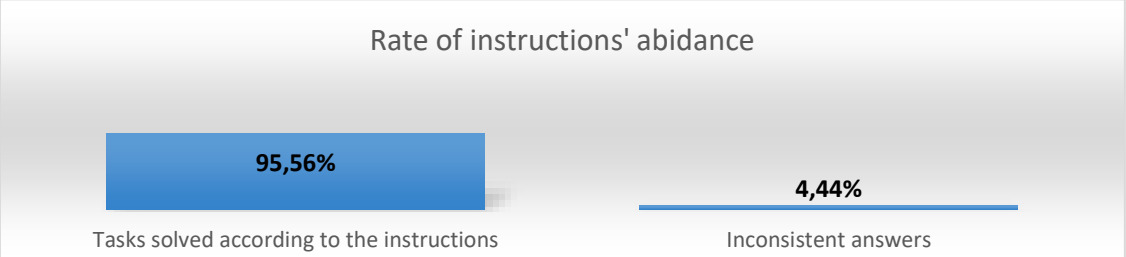

Figure 03. Rate of instructions' abidance

According to these results (Figure 03), it is clear that almost all participants in the study are used to solve the tasks according to the instructions given. These findings only highlight the manner in which the answers were given and not the rate of correct answers for the tasks proposed. As it was stated above, the fact that many of the users did not pay enough attention to the texts provided on the learning platform resulted in a range of varied results concerning the skills dimensions for the two chosen competences.

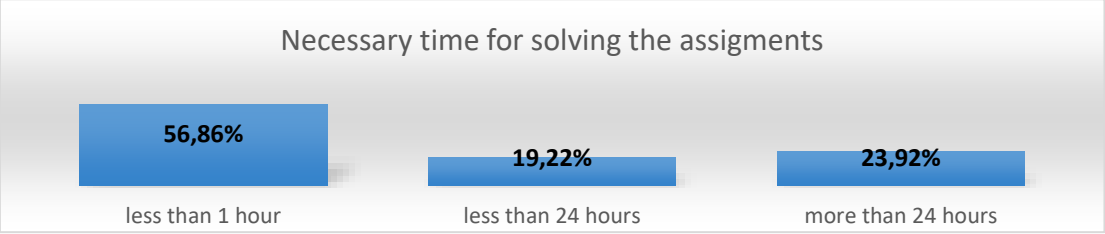

Figure 04. Necessary time for solving the assignments

More than half of the users managed to solve the assignments in less than one hour. This result proves that most of the students were interested in solving the tasks on the spot and one plausible reason may be the fact they found this type of learning appealing. We are inclined to believe this hypothesis since the students were not coerced to use this platform, but rather were presented with it and any type of login activity was at their own will. Also, the discrepancy among the results, showing that students at times needed minutes, hours and even days for solving an assignment proves the need to adjust the learning activities according to each student's pace. For this reason, it is believed that the use of digital learning platforms are useful instruments for not only attaining the formally prescribed competences for each year of study, but also (and perhaps more importantly) for developing the students' lifelong learning skills and attitudes and self-confidence (Figure 04).

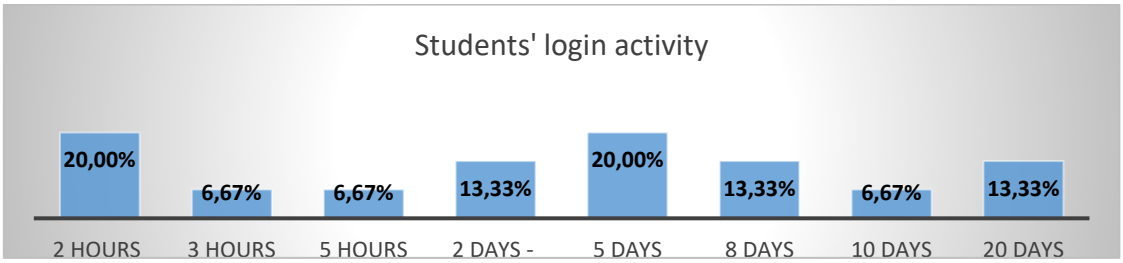

Figure 05. Students' login activity

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The login activity of the participants shows that 33,34% of the users used the platform for less than a day. This proves that the assignments were presented in an attractive form that encouraged the users to solve all the tasks at hand on the spot. It is important to mention the fact that this chart presents the login activity of all the participants in the study and that each one of them has provided answers to all the available assignments. The idea that the learning activity should be adapted to each student's learning profile (rhythm, style), spatial and temporal availability is re-enforced by the percentage of students that needed more days to access the learning platform and solve the assignments (Figure 05).

7. Conclusion

First of all, the fact that the primary school students can use Moodle for studying outside school has been ascertained by the number of students that have provided answers to all the assignments given using this learning platform. The fact that 75% of the user profiles created were accessed accordingly shows that the students are eager to try this kind of learning approach if they are given the opportunity. As for the other 25% who did not access the platform, it must be mentioned that out of these 40% never accessed the platform, while the other 60% accessed the platform only once, opening only a few assignments just to see what they are about. The reasons for not accessing this learning platform again remain unknown, however, suppositions such as lack of time or trust in this type of learning can be made.

Since the rate of instructions' abidance is so high (95,56%), it can be said that this type of assignments has been understood by the students. Thus, with individualised punctual intervention from the teacher to remedy the learning gaps of each student it is believed that the use of a digital learning platform is both effective and efficient as far as the attainment of the competences set by the formal curriculum is concerned. Even though it may require some effort from the teacher at first (to create the learning platform and to design it according to their class' needs), it is useful for the overall assessment of the students' progress and detailed competence attainment.

The assignments were designed is such a way as to require the students to exercise the skills dimensions of the competences chosen for this study. Since the assignments were solved accordingly by most of the students, it can be said that this digital learning instrument is appropriate for the attainment of this competence dimension. Also, the fact that the texts were meant to provide the necessary knowledge level for the competences in question proves that this dimension is also covered by this instrument. Last, but certainly not least, the attitude dimension (claimed to be the most difficult to ascertain) is also covered since enough proof is given concerning the interest for these type of activities by the students' login activity and time spent solving the assignments. Without trying to minimize the importance of face-to-face instruction in the classroom, the results obtained prove that this digital learning instrument can help teachers maximize their students' learning activity both at school and at home if such an instrument is used with a high frequency. Also, it is extremely beneficial since it allows the instruction to be conveyed to all students according to their individual learning profile and temporal availability.

All these being said, it is clear that this type of digital curriculum (if properly used) provides various learning experiences that can be adjusted to each students' necessities and interests and encourages an active approach to learning. Also, it helps teachers measure the level of competence attainment for each child, the data being preserved indefinitely and without bias. All in all, for the study presented it was proven

that the digital curriculum has a beneficial impact on students' learning and it is each teacher's decision if this type of learning instrument suits one's class' necessities and interests. So, if to teach means "to manage the learning" (Petre, 2016, p. 56), the first role of a teacher seems to be clear: to design the school learning even in a contextualized digital way.

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