

Contributions and potential of the WheelDecide digital application in a Basic Education class

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Abstract— Currently, Information and Communication Technologies (ICT) are found in practically all areas of activity and are of essential importance, and therefore, schools are no exception. The internship report aimed to investigate whether the WheelDecide digital application can promote collaborative work and the formative assessment process. To understand this issue, we carried out a qualitative investigation, opting for action research within the scope of Supervised Teaching Practice in Basic Education, in a 2nd year school class, with 21 students. In accordance with the selected methodology, direct/participant observation, field notes, semi-structured interviews with the class teacher and two teachers who teach at the 1st CEB, the application of questionnaire surveys for guardians and photographic records. During the investigation, five intervention sessions were developed, and during the process, different opinions were collected, which allowed triangulation of the data obtained, determining that using WheelDecide can promote collaborative work and create opportunities to carry out evaluation. formative. In this sense and considering the data analysis from semi-structured interviews, we found that teachers consider this resource to have potential, capable of providing significant learning. In the opinion of those in charge of education, it is possible to see that the use of this digital resource can trigger better learning, creating a more motivating environment, even though the presence and supervision of the teacher is not dispensable. After triangulating the data obtained, the importance of using this resource to create innovative contexts that provide more meaningful learning is recognized.

Keywords— *Basic Education; WheelDecide; Collaborative work; Formative assessment; Communication and Information Technologies.*

I. INTRODUCTION

Digital technologies have undergone great evolution and, as such, it is crucial that the School follows this evolution. Therefore, we decided to carry out a study focused on digital technologies due to the importance they present in the teaching-learning process and the benefits in the development and acquisition of digital skills for the students involved.

The investigation was qualitative in nature, being an action investigation. During the investigation, special emphasis was given to the importance of using ICT in an educational context. As part of this research related to digital technologies, we chose to use the WheelDecide digital application. The selection

of this technology is related to the fact that it is a digital application little known and explored in an educational context. As we consider that its integration in an educational context can motivate and facilitate the teaching-learning process, we considered the selection of this digital resource even more pertinent due to the possibility that it offers to be contextualized in the different curricular areas of the Basic Education.

Firstly, we will present a brief theoretical framework on ICT in society and in an educational context. Next, we will explain what the WheelDecide digital application consists of and how it can enhance learning in an educational context, developing collaborative work and allowing the formative assessment process. Subsequently, we will highlight the methodology used in the investigation and then we will highlight the collection and analysis of the data collected. Finally, we will present the main conclusions of the study.

II. ICT IN SOCIETY AND IN EDUCATIONAL CONTEXT

Currently, Information and Communication Technologies (ICT) are found in practically all areas of activity and are of essential importance and, therefore, schools are no exception. ICT is so deeply rooted that it has been referenced for several decades, as we can see from the vision of [8] “(...) no one questions the need to introduce new information technologies in schools anymore (...). They are considered tools that enhance the desire to learn and essential means of accessing information and promoting learning.” Over time, the use of ICT continues to have such relevance that according to [1] educational technology has to be seen and considered “(...) as a set of methodologies, processes, strategies, tools and instruments that can be mobilized to promote maximum learning for all students (...).”

These digital technologies play an important role in schools, contributing to different forms of learning. Using digital technologies and applications, the aim is to increase students' interest and motivation in the activities presented and the learning they are intended to acquire. In general, ICT is a motivating factor for students because young people show great affinity and familiarity with the use of various digital resources in their daily lives. Since digital technologies are very present in our daily lives, it is important to mention that in terms of the educational context, there are countless

educational software programs created to awaken students' curiosity and to motivate them to delve deeper into certain content and themes. According to [6] educational digital applications are those in which children "(...) are cognitively active and engaged, when learning experiences are meaningful and socially interactive, and when learning is guided by a specific goal."

From another perspective, we can say that whenever the "educational" concept is presented, it refers directly to aspects and content worked on at school, in formal education, and does not reflect on the possibility of developing other skills. The use of educational software as a resource in the classroom aims to facilitate the teaching-learning process. The objective is not to replace the teacher or end the way we work in schools, but rather, to complement the work that is done in a more creative way, awakening creativity and providing a more stimulating environment in order to provide better learning and learning more significant.

III. COLLABORATIVE WORK AND FORMATIVE ASSESSMENT

When we enter a classroom there are many differences between students. Taking this aspect into account, the development of collaborative work encourages students to deal with differences in the best way possible. In other words, from different points of view and different conceptions of colleagues in order to be able to discuss them and find converging and/or more consensual points. Collaborative work, as [2] states: "Involves joint decision-making and requires time, careful negotiation, trust and effective communication (...)"

Technologies can promote collaborative work, which is a very important aspect of student development. From another point of view, we can also consider that technologies and the use of digital applications make it possible to evaluate knowledge acquired by students in a way that we can call a little different from traditional assessment. The development of collaborative work can lead to changes in mentality and other ways of seeing an issue and perspective. Collaborative work can be a positive aspect in the way of learning, since children, when talking to their peers, can understand certain content better and more easily, according to different points of view. In this sense, collaborative work must be seen as a priority and as a way of improving the teaching and learning process. From the perspective of [9]: "Collaborative work is essentially structured as an articulated and jointly thought-out work process, which allows better achieving the targeted results, based on the enrichment brought by the dynamic interaction of various specific knowledge and various processes cognitive." Assessment is inherent to the teaching-learning process, so it is essential to understand what assessment consists of. [5], assessment "(...) can be defined as a systematic process of determining the extent to which educational objectives have been achieved by students (...)" According to Decree-Law No. 139/2012, of July 5, assessment "(...) constitutes a process that regulates teaching, guides the school path and certifies the knowledge acquired and skills developed by the student." With regard to formative assessment, this works as regulatory feedback for the student and the teacher. Through this assessment, the student is able to have a more concrete perception of the content they have already mastered and the

content that is not yet well consolidated. In the case of the teacher, he can see which objectives have been achieved, which objectives have been partially achieved or which objectives have not yet been achieved. After this assessment, the teacher can change their methodologies and adapt criteria without ever losing sight of the program and the objectives they want to achieve. As already stated by [3]: the sole purpose of formative assessment is to recognize where and what the student experiences difficulty and seek to inform them. This assessment does not translate into a grade, much less into scores. This is feedback for the student and the teacher.

According to the General Directorate of Education (DGE), in Decree-Law No. 139/2012, of July 5, 2012, the formative assessment process is understood as: "(...) formative assessment is continuous and systematic and has a diagnostic function, allowing teachers, students, guardians and other legally authorized people or entities to obtain information about the development of learning, with a view to adjusting processes and strategies." Through activities developed using the WheelDecide digital application, it was possible to carry out collaborative work, developing several important skills for students. These skills are fundamentally related to improving interpersonal relationships, because through collaborative work the ability to accept the opinions of others, exchange experiences and negotiate is developed. Considering that in the development of collaborative work there is interaction between the participants, dialogue is developed, but also the capacity for reflection. On the other hand, and through these same activities it was possible to be aware of which contents were already consolidated and which still needed further systematization.

IV. THE WHEELDECIDE: A BRIEF CHARACTERIZATION OF THE DIGITAL APPLICATION

The WheelDecide digital application consists of a digital roulette wheel that can be used for different purposes. In the specific case of our research, we intended to use it in a way that could allow the inclusion of different contents in a collaborative context, stimulating interaction between teacher-student and between student-student. This digital application has several purposes, at an educational level. Thus, we can use the digital application whenever we want to choose a student to answer a question or if we want to do it randomly. However, this digital application combines several added potentialities that differ from conventional roulette. Firstly, as it is a digital application, it is very motivating for students. Despite this, it is a content-themed roulette wheel that can be personalized. In other words, it means that it can be reduced, increased and explored according to the needs and specificities of the students in question. On the other hand, the random factor causes students to remain in constant interaction and expectation. Otherwise, taking into account that the students had the privilege of creating thematic roulettes of content, it allowed them to be evaluated in a formative and collaborative way. Picture 1 shows an example of a roulette of contents:



Fig. 1. Example of a roulette of contents.

With the construction of thematic content roulettes, students had to mobilize their knowledge because they had to know the answers and, consequently, know how to select the content. Finally, since thematic content roulettes can be built in groups, it is possible to develop collaborative work. To create the content-themed roulette wheel, there are several customization possibilities, including choosing the color of the roulette wheel, what will be written in each of its sections and even the roulette rotation time.

V. METHODOLOGY

The research was carried out within the scope of the Master's Degree in Pre-School Education and Teaching in the 1st Cycle of Basic Education, within the scope of the Curricular Unit of Supervised Teaching Practice in Basic Education. For the investigation, the following problem question was taken into consideration: "Can the WheelDecide digital application promote collaborative work within the scope of the formative assessment process in a Basic Education class?". As a way of responding to the problem question previously presented, the following objectives were designed: include digital technologies in the classroom context; implement pedagogical activities with the WheelDecide digital application; evaluate the impact of the WheelDecide digital application: in promoting collaborative work and in the class formative assessment process and collecting the opinions of 1st CEB teachers and guardians regarding the use of digital applications in the classroom context.

As part of a qualitative investigation, we considered it relevant and selected action research. This methodology, as the name suggests, has two main objectives: on the one hand, investigation and, on the other hand, action. From the perspective of [7] "(...) we can define action research as the study of a social situation in order to improve the quality of the action that takes place in it." [7] further state that the very purpose of action research is "(...) to support teachers and groups of teachers to deal with the challenges and problems of practice and to adopt innovations in a reflective way." Throughout the action research process there are several steps

to be followed and worked on, namely: in a first cycle – planning, action, observation, reflection; in a second cycle – review, action, observation, reflection; and so on in the following cycles.

According to the methodology selected and used, direct/participant observation, field notes, semi-structured interviews with the class teacher and two teachers who teach in the Basic Education were preferred as data collection techniques and instruments. application of questionnaire surveys to guardians and photographic records. After data collection, triangulation was carried out.

VI. PRACTICAL SESSIONS: DATA ANALYSIS

All activities developed in the five sessions carried out with the WheelDecide digital application were inserted and framed in the didactic units of the different weeks of implementation and in the contents defined by the cooperating advisor. After each intervention session, a reflection was always prepared by the researcher with the cooperating supervisor and the scientific supervisor in order to identify and address weaknesses and highlight strengths.

In the first intervention session, the main curricular area involved was Portuguese. The content associated with this session was related to the exploration of a text where some of the dangers of the Internet were addressed. From this perspective and before working and exploring the text, we asked students about their use of the internet in their daily lives. All students stated that they use the Internet for various purposes, including watching videos on YouTube or even listening to music. After the debate of ideas, some precautions that we should take when using the virtual world were discussed. Taking this context as a starting point, the students were informed that in the following classes we would use the computer to use a digital application. Upon learning this information, they were immediately very excited, as despite having this equipment at home, it is not frequently used in an educational context. The motivation demonstrated was evident, through the questions they asked, namely:

P: Are we really going to use the computer ourselves?

This information provided a lot of enthusiasm among the students, who immediately asked:

M: Can't we use the computer today?

I: But what are we going to do on the computer?

Based on the students' comments, we found that enthusiasm was very present. It was very motivating for us to see the reception from the students. Although we are aware that technologies provide great motivation and enthusiasm for students, such great interest and involvement was not expected.

In the second intervention session, the associated content was related to a guided writing activity, with the main curricular area involved being Portuguese. In this way, we explored the guiding questions for writing a text. These questions were presented using the WheelDecide digital application, in a thematic content roulette previously created by the researcher. The questions to be explored were: Who?; What?; Where?; When? It is like?.

To explore the guiding questions for the guided writing activity, a random student was called to come and spin the content roulette wheel. After exploring the content-themed roulette wheel, the students wrote a text using the answers they recorded while we used the roulette wheel. After exploring the questions in a large group – class, each student wrote their text and at the end they presented the written text to their colleagues.

In this second session, some students had direct contact with the computer and the WheelDecide digital application. The fact that it was a session designed for students to get used to the digital application in question, the content roulette was constructed in advance with the questions that guided the writing activity. On the other hand, and since only a few students were able to interact directly with the computer and the content roulette wheel, it was clear that they were discouraged because they could not all use the computer to explore the roulette wheel. This fact ended up resulting in fragility. At the end of this session, there were several comments heard that showed they wanted to use this resource again:

M.F: Next time can I be the one to go to the computer?

This weakness was discussed with the cooperating supervisor in order to try to overcome this weakness. Despite this less positive particularity, the session was guided by the enthusiasm of using a different resource in the classroom.

The third intervention session had the Study of the Environment as its main curricular area. The content associated with this session related to the study of deciduous trees and evergreen or evergreen trees. In this sense, we initially explored and explained the concepts of deciduous trees and evergreen/evergreen trees using two images. After addressing and exploring these concepts, a new thematic roulette of content related to the study of this same theme was presented. During this intervention session with the WheelDecide digital application, several comments were noticeable from the students, namely:

I.S: Two repeated trees came out...

N.O: Can we get the roulette wrong again?

The fact that repeated questions were asked led to a new comment:

M: Can we write about other trees?

This question arose after we explored all the questions present in roulette, which demonstrates the students' interest in participating in the activities. In turn, since time was already running out in this session, we were unable to accept this request. However, we asked students to think about other trees that could be included in this thematic roulette of content.

This third session proved to be quite interesting as the students who had previously had contact with roulette showed a great desire to “teach” their other classmates how to use content roulette. On the other hand, and through the use of thematic content roulette, discussion was promoted, because at times there were exchanges of ideas between students in a collaborative context. At the end of this intervention session, the cooperating advisor was particularly enthusiastic about using the WheelDecide digital application, both for the

motivation and interest of the students, and for the consolidation of the content in question. In this intervention session, the enthusiasm of the students in using this digital application was also evident.

I: Can't we add more trees to know if they are deciduous or evergreen?

After this comment, the students were asked orally about other trees that could be in the content roulette, in addition to the questions already presented.

In the fourth intervention session, three curricular areas were involved: Environmental Studies, Portuguese and Mathematics. The content associated with this session was related to the properties of air, the interpretation of texts, capacity measurements: liter and volume.

This session was a little different from the previous sessions, as, in this particular session, we first worked on all the content and only afterwards was the thematic content roulette constructed. This content roulette was created by the students after we gave them the challenge of being “teachers” for some time. After teaching all the content, students created questions related to the content covered throughout the week. As a result, the content worked on during the week was recalled and each student recorded this information on the sheet. We then challenged students to write questions related to the same content, highlighting that if there were similar or repeated questions they would be corrected and improved in class. After writing the questions, they were read aloud by the students. There was then a debate of ideas about which questions would be most interesting for the construction of the content roulette, an activity that promoted negotiation and selection of questions within collaborative work. At this point, students were also informed that they had to know the correct answers. Therefore, there was a need to confirm answers, which led to the review of content and its consolidation. In this sense, and albeit indirectly and informally, formative assessment was promoted. This was a very motivating activity for the students because they felt that they would have some responsibility and decision-making capacity. Below we present some of the questions proposed by the students:

A: Does air have weight?

I: Where did the time monster live?

M: Does air take up space?

M.S: What happened when the weather monster was happy?

M.G: Does air have color

After selecting the questions, it was proposed that the students write the questions they created on the computer. The students who wrote on the computer in this session were very enthusiastic, something that can be seen in the following comments:

I: I can help with writing, I liked being on the computer.

M.G: We could write more often here, it's easy! I:

After writing all the questions, the students who had not participated in writing the questions on the computer were called to run the constructed content roulette wheel. When a question was asked, we decided that it was the author of each question who chose which colleague to answer and who

corrected that same colleague if necessary. This moment of the activity once again allowed for collaborative work, but also for formative assessment. By reading and answering the questions, it was possible to identify content that was already systematized and others that needed further consolidation. During this session, the students were very motivated. We consider that this reaction was due to the fact that they had an even more direct participation in the construction of the thematic content roulette. Although the students were very interested whenever we resorted to using the WheelDecide digital application, there was a noticeable feeling of greater satisfaction for having full responsibility for the construction of the thematic content roulette wheel.

In the fifth and final intervention session, three curricular areas were involved: Environmental Studies, Mathematics and Portuguese. The content associated with this session related to safety rules near water, mass magnitude and the interpretation of texts. As in the previous session, firstly, all the content covered throughout the week was recalled. The students recorded this same information and then wrote questions related to these same contents, highlighting that if there were similar or repeated questions they would be corrected and improved in class. There was then a debate of ideas about which questions would be most interesting for the construction of the content roulette, an activity that promoted negotiation and selection of questions, but also collaborative work.

Below we present some of the questions proposed by the students:

C: Can you enter the water without digesting it?

D: What colors are the beach flags?

H: What does the blue flag mean?

M: Why do we have to respect the rules at the pool or beach?

M. J: What can we do when the flag is yellow?

M. M: What is mass?

M. T: What does it mean when you see the checkered flag on the beach?

As in the fourth session, this was a session in which it was possible to see the motivation, interest and commitment of the students. In this session it was also noticeable that the integral construction of the thematic content roulette is what most captivates students, as can be seen from the following comments:

M: The part I liked most was also writing.

D: I enjoyed running! I was the one who decided what the question was...

In the last session it was possible to obtain a more complete thematic content roulette, as can be seen in figure 2. We consider that the roulette obtained in this session is more complete because it has more questions and because all of them are in fact related to the contents worked on. On the other hand, we also consider that this improvement in the construction of the thematic content roulette is due to the knowledge that students have already acquired from previous sessions.



Fig. 2. An example of a roulette of contents used in a practical session.

VII. CONCLUSIONS

Considering the sessions described previously, we found that the use of the WheelDecide digital application promoted motivation and mutual help among students, with collaborative work being observed.

The use of digital resources in itself represents an added value because it awakens students' interest and motivation in learning and carrying out activities from the first moment. Combining a digital application with the computer makes the learning process, in a certain way, much easier. On the other hand, this resource ended up exceeding initial expectations, since through it it was possible to observe mutual help between peers in a collaborative work context. It was quite interesting to see how students got involved in the activities and stayed motivated by new activities using the WheelDecide digital application. It is also important to note that in order to carry out the activities and to construct the thematic content roulette, students had to know the subjects and when they were not sure of the answers they were, in a way, "forced" to review and consolidate those same contents. In this way, within the context of a formative assessment, moments and spaces were created for the consolidation of learning and, consequently, for greater educational success.

Looking back at the intervention sessions, we consider that although it was very important at first to have the thematic content wheel ready to use, it was much more interesting for the students to fully build the wheel with the students' direct intervention. The students' interaction with the computer resulted in greater dynamism and involvement in the classes themselves, as they were given authority and responsibility in terms of decision-making and initiative.

According to the content analysis carried out on the semi-structured interviews, we can state that the teachers interviewed considered the use of the WheelDecide digital application in an educational context to be relevant and interesting. However, it was found that there are some

“barriers” that make it difficult to use these resources. Such obstacles are related to the lack of equipment and technological conditions in schools. We also realized that none of the three teachers knew the WheelDecide digital application, so a practical demonstration of the digital application had to be made. Through content analysis, it was possible to verify that the teachers interviewed consider that using the WheelDecide digital application, learning becomes more attractive, dynamic and capable of motivating and capturing students' attention.

According to the data obtained through questionnaire surveys carried out with parents/guardians, we understand that the majority consider technologies to be very important and capable of making activities more motivating, playful and appealing. On the other hand, it is noticeable that they do not call the role of the teacher into question, since they believe that technologies cannot replace the teacher. Despite not being familiar with the WheelDecide digital application, respondents believe that it can function as a playful element in the classroom, much to the liking of their students, which promotes an educational context that motivates them to learn.

Systematizing and concluding, we can say that the inclusion of digital technologies in Basic Education is important and essential. Students were born in a digital era and, as such, have a strong attraction to technologies: digital natives. Therefore, it is essential to develop digital skills in students so that they can make conscious use of ICT. The integration of collaborative work and formative assessment, ICT and the WheelDecide digital application create a motivating, innovative and stimulating environment that facilitates students' acquisition of learning. In this way, students develop

digital skills, but also cognitive skills for fuller social integration.

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