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USE OF FREE SOFTWARE TO MONITOR SCHOOL LEARNING BASED ON DATA: A PROPOSAL

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Abstract: Technological devices facilitate the reach of knowledge and the expansion of the learning process. More than just serving as a content repository, such devices can collect data that are capable of providing students and educators with information that enable them to review assessment methods, making them more individual and, consequently, assist in the development of personalized learning plans, based on data. Thus, we intend to discuss the creation of a free software platform that allows monitoring the evolution of the students' learning process, in addition to providing new learning strategies and the development of cognitive skills.

Keywords: Learning, software, teaching.

INTRODUCTION

Increasingly, human life in the 21st century is permeated by technological devices such as telephones, computers, cars, machines and various tools that make life easier and improve well-being. Along with them, we also find resources with high elaboration and development, which include artificial intelligence, machine learning, blockchain, Intelligence of things (IoT), data analysis, among others that, through advanced algorithms, allow for greater scope and speed. information and facilities for users in the most diverse dimensions of life, such as health, entertainment, communication, education, among others.

In this sense, education has become increasingly mediated by technological resources such as these, allowing new constructions in the relationship between student, teacher, institution, information and, above all, between the student and the content to be learned and, without a doubt, promoting more autonomy for students. Research in education indicates that effective learning occurs from the commitment of subjects during the process and also from their ability to control their own learning (CRUZ et al, 2019). Therefore, the more autonomy the student has, the more conditions he will have to commit to the learning process, especially if he has tools that favor him in this.

It is also important to consider that, in addition to simple access to content, assessments are essential to verify the student's evolution and enable the necessary adjustments and corrections to the teaching-learning process. However, traditional methods of evaluation and monitoring of teaching do not consider the different factors that can influence their results. (GIACOMAZZI, 2016). A generalist education that does not take into consideration, the individual limitations and difficulties of students will hardly form people who can develop their skills easily.

Thus, it is important to think of a teaching model that is supported by open access technological support, to ensure comprehensive access, and that is capable of collecting data and providing valid information to students and teachers. The purpose of this would be, therefore, to significantly expand the individual development of each student in the learning process from the construction of autonomy and data that correspond to their evolution, as well as enabling teachers to improve their teaching techniques and didactics based on the results, since, in a certain sense, learning is a reflection of the methodology used in teaching.

OBJECTIVE

Propose the creation of a platform that directs the student to basic teaching contents, similar to those offered at school, and strategies for the development of metacognitive skills and new ways of apprehending said contents in a personalized way, with the objective of enhancing learning.

DISCUSSION

To achieve this objective, we initially propose a bibliographic survey on existing digital platforms aimed at teaching in Brazil, used in private and public school and academic environments, and which of them allow some type of personalization of teaching. The personalization of teaching as a support for learning is central in this research, as it can allow constant feedback to the student, indicating their level of knowledge acquisition in each topic and their predisposition to new learning, in addition to just providing educational content (PIMENTEL et al., 2004).

It is important to emphasize that the use of software and teaching platforms are not only at the service of distance education. The proposal is that they are based on both distance and face-to-face education. Distance education, in turn, already exists even before the popularization of the computer and digital devices, and has already been very present in the formats of books, magazines, tapes, videocassettes, CDs and DVDs, in addition to classes and courses broadcast on TV, among other formats. (GOMES & PIMENTEL, 2021).

Currently, however, it has been seen that distance education has expanded more and more in Brazil and around the world and, with it, the use of technological support that allows students to access the contents of teaching proposals. Some of these formats, also called Virtual Learning Environments - VLE - are supported by platforms with advanced resources that allow students to monitor the progress of their learning, percentage of content already studied, percentage of correct answers in assessments and, in some cases, teaching absorption percentages. (ARAUJO, R.; OTSUKA, J.; OLIVEIRA, R.; FALVOJR, V.; BARBOSA, E. F. 2019; BEDER, D. 2009; ROSALES, G.; GIACOMAZZI, 2016).

A VLE, according to Gomes and Pimentel (2021), is software developed for use through the Web or through applications, with the objective of providing functionalities and mechanisms that involve the main elements of the educational scenario: student, teacher, content and the mediation of learning. Besides, according to them, a good VLE provides several tools for communication, interactivity and structuring of teaching-learning processes, which can favor interaction between teacher-student, student-student and, above all, between student and content.

According to Cruz et al (2019), many Brazilian higher education institutions make use of different formats of tools, some of which are exclusive to the institutions themselves and others of common use to more than one of them. Most private institutions use their own AVAs or those provided by other private companies, in which they only place content, such as texts, links, articles, books, whether in Word or PDF formats, videos, images and audios. Public institutions, in turn, mainly use tools that are freely accessible to users and that are also free software, although they are very similar to the software of companies and private institutions.

Gomes and Pimentel (2021), in an important study, present some of the most common software for the virtual learning environment and some of its main features, the most common being: Moodle, BlackBoard, Amadeus, Edmodo and Openredu. They also present an evolution of the creation and development of these software in the last decades, in addition to the main purposes for which they are intended and available resources.

However, despite this variety of software, the most common in public education environments in Brazil is Moodle. According to studies by Gomes and Pimentel (2021), Moodle (Modular Object-Oriented Dynamic Learning Environment) is the best-known LMS (Learning Management Systems) on

the market, with approximately 1,370,000 registered users worldwide in 2021. Cruz et al (2019) point out, confirming the research by Gomes and Pimentel (2021), that Moodle is the main VLE model used in Brazil. However, according to the authors, Moodle lacks some applications that allow more individual monitoring of students, such as cognitive skills and indicators of knowledge acquisition.

In this sense, recent research points to an important dimension related to the learning process, especially that which is mediated by technological devices, which concerns the acquisition and development of cognitive and metacognitive skills. (CRUZ, et al, 2019; FEITOSA, M.; OMAR, N. 2019). These skills refer both to the learning process itself and to the metacognitive capabilities of tracking, monitoring, planning and managing one's own learning.

The assessment and monitoring of cognitive skills, as well as of learning itself, can significantly favor the progress of students, as in addition to making content relevant to their learning phase available to students, they allow for a more adequate assessment of learning and management. by the student who learns. Some authors (CRUZ, et al, 2019; GOYA, D et al. 2017; LAGUARDIA, J.; PORTELA, M.; VASCONCELLOS, M. 2007) point to the importance of monitoring and improving metacognitive skills for more effective performance in the learning process, demonstrating how reaching said can improve and enhance students' educational development.

Likewise, according to other authors (ALLIPRANDINI, P. 2014; FEITOSA, M.; OMAR, N. 2019; PIMENTEL, E. et al, 2006), it is important that there are ways in which the student monitors their own academic progress and can focus on topics that have greater difficulty, in order to have a more effective learning. This learning, in turn, supported by

cutting-edge technologies, is based on data, which are the basis for collecting information and returning it to the student.

However, according to Carvalho; Cunha & Quiala (2021) for teaching regular public-school students, who attend classes in person or, after the advent of the pandemic, by digital means, this tool with more advanced resources and based on data analysis is not yet available. What is available today, whether in Moodle or in other software used in public education, does not include assessment and monitoring of metacognitive skills or a tool based on data analysis that allows a more adequate view of individual progress. Moodle is mainly a vehicle for transmitting information between the teacher and the student, functioning, in many cases, as a repository of texts and files. As much as it allows some other resources, such as building an entire course or discipline and carrying out assessments, Moodle does not have tools that promote metacognitive skills management and not even an advanced system for individual knowledge development.

Regardless of the teaching model, whether face-to-face, remote or hybrid, software that helps students monitor their development can bring many benefits. According to Cruz et al (2019), the use of technologies aimed at education can serve as an addition to teaching and learning and, as Segenreich (2008) points out, digital platforms can even allow the existence of collaborative learning, favoring the acquisition and sharing of knowledge between students and the community as a whole, regardless of where users are.

In view of this, it is seen that the use of technological resources that support students at all stages of the school trajectory is urgent. However, it is essential that these resources are made available in a universal and as accessible way as possible, so as not to generate segregation or disadvantage for any group. In addition, for access to this type of

tool to be democratic and accessible to all, it is understood that it is necessary to build it as free software, both for collaborative construction and for shared use, as presented by Evangelista (2014).

Today there are several application formats that, even if they are not used directly for teaching in schools or are not configured as VLEs, use artificial intelligence and results based on data analysis to provide more reliable results to users, which allows them autonomy in the learning and a more accurate analysis of points of attention for improvement or the user's strengths (RODRIGUES, 2019). You can easily find applications like these on the internet, some of them quite popular, such as Duolingo, ABA English, Anki, EnglishGap, Khan Academy, among others. One of them, already well known and in common use in some high schools, is Geekie Games, which enables learning more oriented to the needs of students from learning paths. This shows, therefore, that there is already a solid construction of using data as a methodology to support a better learning process.

What is proposed with this article, finally, is the creation and propagation of a free teaching and learning software, with collaborative construction, based on the most advanced techniques of software creation, such as Artificial Intelligence and Big Data (data analysis) to help both teachers and students. The possibility of having content to be done on the platform, such as the regular content of the curriculum matrix and some others, especially aimed at the development of cognitive and interpersonal skills or learning strategies, can favor the learning process as a whole, since that, according to Laguardia; Portela & Vasconcellos (2007), the teaching-learning process is holistic and must take place beyond the walls of the classroom.

Therefore, through the union of efforts from the most diverse sectors of society and the collective participation of educators, students, programmers and companies, it is possible to support students and teachers with more resources for educational success and the universalization of the right to education.

CONCLUSION

The proposal to develop software for monitoring learning encompasses aspects of the areas of technology and education, seeking to integrate individual skills so that students feel challenged to learn more and better. With this work, we intend to present that digital tools, as Free Software, can contribute to a more democratic and objective learning.

The mapping of the learning to be carried out will be able to facilitate the learning evaluation process both from the student's perspective - who will be able to regulate their thinking and learning processes - and from the teacher's perspective - who will be able to analyze the students' knowledge construction process, from monitoring of their individual production, in addition to being an important agent in future adjustments in the teaching process.

REFERENCES

ALLIPRANDINI, P. et al. Estratégias de aprendizagem utilizadas por estudantes na educação à distância: implicações educacionais. Psic. da Ed., São Paulo, 38, 1º sem. de 2014, pp. 5-16.

CARVALHO, Alba Valéria Gomes. CUNHA, Marcos Roberto Da. QUIALA, Rosário Fernando. O Ensino Remoto a partir da pandemia, solução para o momento, ou veio para ficar?. Revista Científica Multidisciplinar Núcleo do Conhecimento. Ano 06, Ed. 05, Vol. 10, pp. 77-96. Maio de 2021. ISSN: 2448-0959, Disponível em: <https://www.nucleodoconhecimento.com.br/educacao/partir-da-pandemia>.

CRUZ, E. et al. Ferramenta para Autoria e Acompanhamento de Atividades Metacognitivas no Ambiente Moodle. Brazilian Symposium on Computers in Education (Simpósio Brasileiro de Informática na Educação - SBIE), [S.l.], p. 179, nov. 2019. ISSN 2316-6533. Disponível em: <https://www.br-ie.org/pub/index.php/sbie/article/view/8722>.

EVANGELISTA, Rafael. O movimento Software Livre no Brasil: política, trabalho e hacking. In: Horizontes Antropológicos, Porto Alegre, ano 20, n. 41, p. 173-200, jan./jun. 2014. Disponível em: <https://doi.org/10.1590/S0104-71832014000100007>

FEITOSA, M.; OMAR, N. Um Modelo para Avaliação do Conhecimento Acadêmico com Base em Unidades Conceituais. Brazilian Symposium on Computers in Education (Simpósio Brasileiro de Informática na Educação - SBIE), [S.l.], p. 31, nov. 2019. ISSN 2316-6533. Disponível em: <https://www.br-ie.org/pub/index.php/sbie/article/view/8707>.

GIACOMAZZI, M. A. Proposta de aplicativo móvel para monitoramento da avaliação da aprendizagem no ensino superior. 2016. 150 f.. Dissertação - Mestrado Profissional em Educação e Novas Tecnologias, 2016. Disponível em: <https://repositorio.uninter.com/handle/1/67>.

GOMES, Alex Sandro; PIMENTEL, Edson Pinheiro. Ambientes Virtuais de Aprendizagem para uma Educação mediada por tecnologias digitais. In: PIMENTEL, Mariano; SAMPAIO, Fábio F.; SANTOS, Edméa (Org.). Informática na Educação: ambientes de aprendizagem, objetos de aprendizagem e empreendedorismo. Porto Alegre: Sociedade Brasileira de Computação, 2021. (Série Informática na Educação CEIE-SBC, v.5) Disponível em: <https://ieducacao.ceie-br.org/ava>

GOYA, D et al. O Uso de Estratégias de Aprendizagem Cognitivas e Metacognitivas na Disciplina Semipresencial de Processamento da Informação. In: Anais dos Workshops do VI Congresso Brasileiro de Informática na Educação. 2017. p. 1079-1088. Disponível em <DOI: 10.5753/cbie.wcbie.2017.1079>.

LAGUARDIA, J.; PORTELA, M.; VASCONCELLOS, M. Avaliação em ambientes virtuais de aprendizagem. Educação e Pesquisa, São Paulo, v.33, n.3, p. 513-530, Fundação Oswaldo Cruz, 2007. Disponível em <https://www.scielo.br/j/ep/a/SjqMdvjbpY5BzLJMprTjJ7n/?format=pdf&lang=pt>.

OLIVEIRA, R.; FALVOJR, V.; BARBOSA, E. F. Internet das Coisas aplicada à Educação: Um Mapeamento Sistemático. Brazilian Symposium on Computers in Education (Simpósio Brasileiro de Informática na Educação - SBIE), [S.l.], p. 499, nov. 2019. ISSN 2316-6533. Disponível em: <https://www.br-ie.org/pub/index.php/sbie/article/view/8754>.

PIMENTEL, E. et al. Um modelo para avaliação e acompanhamento contínuo de aprendizagem. Tese de doutorado. 2006. Disponível em <https://br-ie.org/pub/index.php/sbie/article/viewFile/314/300>.

RODRIGUES; S. J. S. EnglishGap: aplicativo móvel para ensino da língua inglesa. UFRP; Recife: Penambuco, 2014.

ROSALES, G.; ARAUJO, R.; OTSUKA, J.; BEDER, D. Aplicação de redes de sensores lógicos no monitoramento de ambientes de aprendizagem. XX Simpósio Brasileiro de Informática na Educação, Universidade Federal do Rio Grande do Sul, 2009. Disponível em <http://www.niee.ufrgs.br/eventos/SBIE/2009/conteudo/artigos/completos/62184_1.pdf>.

TEIXIERA, C. V., Lima, K. M. R. (2020). NOVAS FORMAS DE APRENDIZAGEM: UTILIZAÇÃO DA PLATAFORMA ADAPTATIVA GEEKIE GAMES. <http://www.abed.org.br/congresso2020/anais/trabalhos/57107.pdf>

SEGENREICH, S. Tecnologia na avaliação da aprendizagem colaborativa online: contribuição do fórum de discussão. Revista Tecnologia e Sociedade, v. 4, n. 6, pp. 153-174. Universidade Tecnológica Federal do Paraná, 2008. Disponível em <https://www.redalyc.org/pdf/4966/496650325009.pdf>.