Gamified Digital Trail: Experience report of collaborative work between University and School

Trilha Digital Gamificada: Relato de experiência de um trabalho colaborativo entre Universidade e Escola

Sendero Digital Gamificado: Informe de experiencia de trabajo colaborativo entre Universidad y Escuela

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RESUMO

Objetivo: Relatar a experiência de integração de Professores da Universidade e da Escola Básica, tendo como foco a criação de um recurso pedagógico digital inovador destinado a aprimorar o ensino de fisiologia humana na Escola Básica. **Método:** Trata-se de um relato de experiência, de caráter descritivo, acerca das vivências de professores da Universidade Estadual de Feira de Santana e de uma Escola Pública do Estado da Bahia, entre outubro de 2022 a outubro de 2023. As atividades foram organizadas em duas etapas interconectadas: 1) Realização de um Curso de formação de Educação à Distância (EaD) durante a Semana Nacional de Ciência e Tecnologia (SNCT). 2) Elaboração de um material didático inovador envolvendo as tecnologias digitais educacionais, como produto final do Curso EaD realizado na SNCT. **Resultados:** Elaboração do jogo de tabuleiro, intitulado jogo de trilha gamificada denominada "Trilha Corpo Humano: Conhecer para Cuidar". **Conclusão:** A proposta desenvolvida no presente trabalho vislumbrou a inovação da prática pedagógica, por meio do desenvolvimento de novas tecnologias educacionais, contribuindo para a melhoria do ensino na Escola.

Descritores: Educação Básica; Ensino inovador; Corpo Humano; Tecnologias.

ABSTRACT

Objective: To report the experience of integrating University and Primary School Teachers, focusing on the creation of an innovative digital pedagogical resource aimed at improving the teaching of human physiology in Primary Schools. **Method:** This is an experience report, of a descriptive nature, about the experiences of teachers at the State University of Feira de Santana and a Public School in the State of Bahia, between October 2022 and October 2023. The activities were organized in two interconnected stages: 1) Carrying out a Distance Education (EaD) training course during National Science and Technology Week (SNCT). 2) Creation of innovative teaching material involving digital educational technologies, as the final product of the Distance Learning Course held at SNCT. **Results:** Preparation of the board game, entitled gamified trail game called "Human Body Trail: Knowing to Care". **Conclusion**: The proposal developed in this work envisioned the innovation of pedagogical practice, through the development of new educational technologies, contributing to the improvement of teaching at School.

Descriptors: Basic education; Innovative teaching; Human body; Technologies.

RESUMEN

Objetivo: Reportar la experiencia de integración de Profesores Universitarios y de Educación Primaria, centrándose en la creación de un recurso pedagógico digital innovador orientado a mejorar la enseñanza de la fisiología humana en la Escuela Primaria. **Método**: Se trata de un relato de experiencia, de carácter descriptivo, sobre las vivencias de docentes de la Universidad Estatal de Feira de Santana y de una Escuela Pública del Estado de Bahía, entre octubre de 2022 y octubre de 2023. Las actividades se organizaron en dos espacios interconectados. etapas: 1) Realización de un curso de capacitación en Educación a Distancia (EaD) durante la Semana Nacional de Ciencia y Tecnología (SNCT). 2) Desarrollo de material didáctico innovador que involucre tecnologías educativas digitales, como producto final del Curso a Distancia realizado en el SNCT. **Resultados:** Elaboración del juego de mesa, titulado Juego de Sendero gamificado denominado "Human Body Trail: Saber Cuidar". **Conclusión:** La propuesta desarrollada en este trabajo vislumbró la innovación de la práctica pedagógica, a través del desarrollo de nuevas tecnologías educativas, contribuyendo a la mejora de la enseñanza en la Escuela.

Descriptores: Educación básica; Enseñanza inovadora; Cuerpo humano; Tecnologías.

EXPERIENCE REPORT

Introduction

Contemporary education is constantly faced with challenges in the mission of engaging students effectively, especially when it comes to addressing complex topics such as the systems of the human body. Thus, by providing attractive and innovative educational practices, where the student has the chance to learn in a more active, dynamic and motivating way, educational games can become important aids in the teaching and learning process.[1]

In this context, the teaching and learning process has increasingly contemplated the use of active teaching methodologies, which enable the student to be the protagonist of their own learning, while the teacher, in this case, assumes a role of facilitator of the learning process.[2] The literature indicates that educators, especially in the health area, need to develop increasingly complex competencies and skills, involving problem solving and inter, multi and transprofessional teamwork, with and without the mediation of new information and communication technologies.[3] In fact, health education contains complex challenges, since it needs to train students in cognitive skills. psychomotor and affective.[4]

With regard to health education, the school becomes an important space for development, in which there is a fundamental need for knowledge sharing and integration with the community. In fact, the school environment is very favorable to health promotion, since it contains the largest portion of the population with a strong interest in learning, and the potential for disseminating information often exceeds its physical limit, which is one.[5] In this context, Lopes et al (2018)[6] highlight that, in addition to transmitting knowledge about health by disciplines, Schools should also educate and develop critical values and attitudes related to social reality and lifestyle promotion in the process of acquiring skills that support lifelong learning and are conducive to health autonomy and empowerment.

In recent studies by our working group, it was observed that the use of educational technologies in the classroom promotes effective gains in competitiveness, interactions and fun on the part of the participants, as well as the autonomy of the students.[7,8] In this context, facilitating skills and competencies to work simultaneously in the teaching-learning process are developed, in addition to enabling conditions for the construction of knowledge in an interactive and fun way. through the use of games and other planned recreational activities.[9]

According to Guyton and Hall (2006)[10], the objective of Physiology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Considering the importance of having the real insertion of Physiology in the school context, since this is still poorly worked, especially in Basic Education[11], in the present work a board game was developed, entitled gamified trail game called "Human Body Trail: Knowing to Care", which can be used as pedagogical support material for Science classes in Basic Education. From the perspective of assisting students in the understanding and integration of concepts of human physiology. Thus, this article presents the approach to idealization and implementation of the gamified trail, describing the steps involved and the pedagogical principles that guided its creation. The present work had as its general objective to report the experience of integration

of University and Basic School Teachers, focusing on the creation of a digital pedagogical resource aimed at improving the teaching of human physiology in Basic School, with a view to supporting the understanding of students with regard to the vital systems that integrate the human organism.

Method

This article is characterized as an experience report, of a descriptive nature, about the experiences of research professors of the Center for Research in Science and Biology Teaching (NUPEECBio), of the Department of Biological Sciences of the State University of Feira de Santana (UEFS), in partnership with a Basic Education Teacher linked to a Public School in the city of Salvador, Brazil. Bahia. The activities were developed from October 2022 to October 2023, with the support of the "Science at School" and "Health at School" Programs of the Bahia State Secretariat (SEC – BA). Such actions of the program were also supported by the School Health Program (PSE), linked to primary health care, which focuses on prevention and health promotion, contributing to the education of students.[12] In this context, in the present study, the actions were organized in two interconnected stages, as detailed below.

Step 01: Teaching a training course in the format of Distance Education (DE). This stage was carried out during the National Week of Science and Technology, in 2022, with the realization of the Distance Learning Course: "Science Teaching for Health Promotion at School, which has the partnership of the Department of Education of the State of Bahia (SEC/BA)". The course included synchronous and asynchronous activities, involving several training activities. With a focus on Interdisciplinary and Interprofessional Teaching in Health, the training activity was distributed in four (4) modules: 1) Environment; 2) Micro to Macro; 3 Anatomical physiology and 4) Technologies. During the course, Basic Education teachers were encouraged to develop a Final Course Product (PFC), involving innovative didactic material to be used in their return to the classroom. This proposal enabled the dialogue between Basic Education Teachers, NUPEECBio professors and researchers and students from different UEFS courses, especially from undergraduate courses and in the area of health. The participants were guided by the research professors from NUPEECBio who made up the course team, according to the training and line of action of each member and encouraged to disseminate the experience of developing the innovative educational product in the form of publication.

Step 02: Elaboration of the PFC. At this stage, the board game was built, entitled gamified trail game called "Human Body Trail: Knowing to Care", through the integration of teachers from NUPEECBio and the Basic School. This pedagogical tool was developed within the scope of the Technologies Module, with the participation of professors from the areas of Biology, Physiology, Genetics and Technologies. With a view to the planning and development of didactic material with a focus on innovation in the teaching of human physiology in Basic School, several hybrid activities were carried out among teachers, involving remote meetings. To this end, different digital platforms were used, including Google Classroom, Google Drive, Google Docs and Whatsapp. focused on the management of activities, as well as on the sharing of technical-scientific knowledge and practical experiences, seeking the creation and improvement of

tools, so that the work could be carried out collaboratively. To this end, in this second stage, a digital resource was developed that can be used flexibly, both as classes for reviewing and consolidating concepts for students in the 8th grade of Elementary School, and as an instrument for recomposing learning in High School.

Results and Discussion

In education, there is a constant need to review and update teaching methodologies in order to improve the teaching-learning process. Such an update envisions the use of technologies, including the use of digital educational games.[13] In the present study, a didactic resource involving a gamified trail was proposed. This proposal was initiated, within the scope of a Distance Learning Course held during the SNCT of the year 2022. As described by Pimentel (2018)[14], the term gamification comprises the application of game elements in non-game activities, configuring itself as a promising support tool in the teaching and learning processes.

In this context, at the end of stage 01, with the teaching of the theoretical part of the Distance Learning Course "Science Teaching for Health Promotion in Basic School" offered to Basic Education Teachers, in Module 4 of the respective Course, the idealization and creation of a pedagogical trail took place. This proposal was idealized by a Basic Education Teacher, who was stimulated by the contents and discussions held during the Distance Learning Course. Thus, with the support of the research professors of NUPEECBIO UEFS, the gamified trail game called "Human Body Trail: Knowing to Care" was created, which aims to work, in an innovative way, the contents of Human Physiology, with students of the School.

This didactic strategy is a digital artifact built on the Genially platform, which focuses on reviewing the different systems of the human body in a creative and deeply engaging educational experience. The didactic resource involves a gamified trail on the different Systems of the Human Body, called the Human Body Trail: knowing to care (Figure 1), and is aimed at students of Basic Education, especially in the discipline of Science, of Elementary School II. which is available free of charge on the website: https://app.genial.ly/.

Figure 1. Cover of the Human Body Trail on the Genially platform.

The Human Body Trail represents a gamified digital artifact that allows the realization of a content review in a creative way about the systems of the human body, where the student is able to understand the theme "Human Body" in the form of a gamified track, using playful, digital and non-digital resources. Such an innovative approach to teaching that creates a dynamic and motivating learning environment for the student. In this way, gamification is used in the search for a deeper understanding of the subject, thus stimulating students' interest in health science, while capitalizing on the advantages of technology in the teaching-learning process.

As a narrative of the trail, we seek to present the option in which the student needs to perform a 'consultation' to attest to the health status of the person (patient) (Figure 2). Thus, as a sign of empowerment, the student will be the doctor who will assist the patient throughout the consultation, providing a seal as a reward when completing the activities that involve this system. For this, it is necessary to carry out the diagnosis and investigate the systems to discharge the individual, through a password/password.

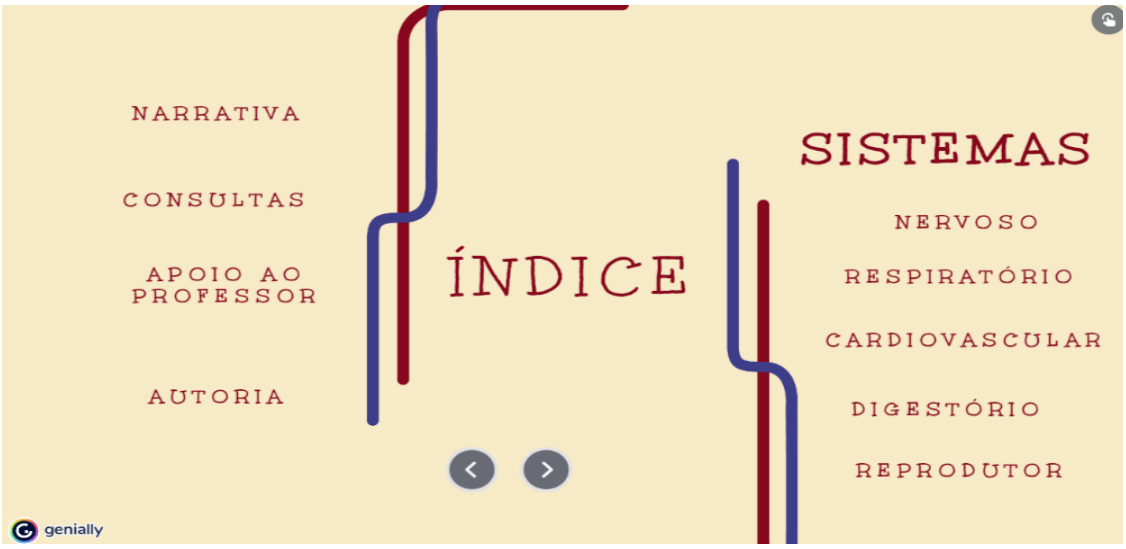

Figure 2. Presentation of Track options to the student.

According to Bernard (1984)[15], the objective of Physiology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Knowledge of the causes of the phenomena of life in the normal state, in turn, will teach us to maintain the normal conditions of life and to preserve health. From this perspective, in the pedagogical path created in this article, five physiological systems of the human organism are addressed: nervous, cardiovascular, respiratory, digestive and reproductive. As far as gameplay is concerned, in each appointment, to receive the seal, the patient must perform 3 tasks: Examination, Diagnosis, and Prescription. Thus, along the trail, 15 tasks will be performed to earn the health certificate, as shown in Figure 3.

Figure 3. Health Certificate/ Human Body Trail.

The tasks of the trail are subdivided into online activity, involving multiple-choice questions to be completed in the Google form. In addition, the student must also perform offline activities, which must be performed with the help of a notebook.

As shown in Figure 4, in this pedagogical tool, the tasks are named and organized along the trail in three stages (Examination, Diagnosis, Prescription/Treatment). In stage 1, Exam, the student must answer three objective questions related to the system in question using the Google Form.

In stage 2, Diagnosis, the participant must perform a digital activity using an online tool, which can be Kahoot, Quizzes, Flippty, WordWall, Words Capture, among others. In the third and last stage, Prescription/Treatment, the student must perform an offline activity, that is, without the use of technology, to be carried out in the notebook with the support of the textbook (readings, schemes, syntheses).

Figure 4. Structure of the Consultation - Human Body Trail.

With regard to the comprehension of health-related contents, especially Physiology, the literature indicates that transmitting information about the functioning of the human body, describing the characteristics of diseases, as well as listing hygiene habits, are not enough for students to develop healthy lifestyle attitudes.16 Therefore, in the present study, through the integration of teachers from the University and the Basic School, A tool was developed that promotes interactivity, with the use of game elements, as a way to bring technologies, engagement and involvement of students in relation to the study of the systems of the human body.

In this context, this innovative pedagogical tool has as its perspective a deeper understanding of the students of the School regarding the proposed theme, thus stimulating the interest of the students in the contents of human physiology. In addition, it encourages the student's independence and autonomy in the search for knowledge, thus making it a tool to support interactive and dynamic teaching methodologies for students. It is worth mentioning that the proposed methodology also capitalizes on the advantages of technology in the teaching-learning process.

Final Considerations

In the present work, through the integration of teachers from the University and the Basic School, within the scope of a distance learning course, a PFC was proposed and elaborated, which culminated in the production of a gamified digital track. This proposal was an opportunity for those involved to improve their teaching practice through the development of didactic products. The pedagogical trail was designed to meet the demands of the School, correlating the knowledge and themes developed during the Distance Learning Course. Its main objective was the promotion, expansion and acquisition of knowledge by students in the search to stimulate the innovative and interdisciplinary character of teaching-learning practice.

Considering the importance of the Initial and Continuing Education of School Teachers from the perspective of Health Education as a factor of promotion and protection and a strategy for the achievement of citizenship rights, efforts will be made so that new editions are carried out reaching a greater number of schools and students, thus strengthening the dialogue between University and Basic Education.

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