Overcoming educational challenges: an innovative remote program for high school students during the pandemic

Curso de férias na pandemia: um projeto inovador com estudantes do ensino médio

DOI: 10.55905/revconv.16n.10-205

Recebimento dos originais: 15/09/2023
Aceitação para publicação: 20/10/2023

Ellen Eduarda Fernandes
PhD Student in Sciences Applied to Oral Health
Institution: Instituto de Ciência e Tecnologia da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP) – Câmpus São José dos Campos
Address: São José dos Campos – SP, Brasil
E-mail: ellen.fernandes@unesp.br

Amanda Rodrigues Rehem
Master in Applied Oral Health Sciences
Institution: Instituto de Ciência e Tecnologia da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP) – Câmpus São José dos Campos
Address: São José dos Campos – SP, Brasil
E-mail: amanda.rehem@unesp.br

Jacqueline Maria Ferreira
Graduating in Dentistry
Institution: Instituto de Ciência e Tecnologia da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP) – Câmpus São José dos Campos
Address: São José dos Campos – SP, Brasil
E-mail: jacqueline.ferreira@unesp.br

Anderson de Oliveira Nascimento
PhD Student in Sciences Applied to Oral Health
Institution: Instituto de Ciência e Tecnologia da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP) – Câmpus São José dos Campos
Address: São José dos Campos – SP, Brasil
E-mail: a.nascimento@unesp.br

Monica Ghislaine Oliveira Alves
PhD in Oral Biopathology
Institution: Instituto de Ciência e Tecnologia da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP) – Câmpus São José dos Campos
Address: São José dos Campos – SP, Brasil
E-mail: monica.alves@unesp.br
ABSTRACT
The COVID-19 pandemic catalyzed a paradigm shift in education, necessitating innovative approaches to engage students. This article discusses the "Winter at the University" project, which aimed to bridge the gap between higher education and public schools during the pandemic. The project encompassed remote stages, from promotion to execution, with a selection process utilizing online forms. The instructional design featured synchronous sessions, virtual laboratories, and flipped classroom techniques. The initiative fostered interest in science, though the virtual format limited hands-on experiential learning. As a future direction, the study recommends longitudinal impact assessments, comparative analyses, qualitative inquiries, and exploration of cross-disciplinary and demographic aspects. The findings offer insights into the potential and constraints of remote learning, illuminating avenues for further research and development in transformative education strategies.

Keywords: student engagement, transformative education, active teaching methodologies.

RESUMO
A pandemia da COVID-19 catalisou uma mudança de paradigma na educação, exigindo abordagens inovadoras para envolver os alunos. Este artigo discute o projeto "Inverno na Universidade", que teve como objetivo preencher a lacuna entre o ensino superior e as escolas públicas durante a pandemia. O projeto abrangeu etapas remotas, desde a promoção até a execução, com um processo de seleção que utilizou formulários on-line. O projeto instrucional contou com sessões síncronas, laboratórios virtuais e técnicas de aula invertida. A iniciativa promoveu o interesse pela ciência, embora o formato virtual tenha limitado o aprendizado prático e experimental. Como direção futura, o estudo recomenda avaliações de impacto longitudinal, análises comparativas, pesquisas qualitativas e a exploração de aspectos multidisciplinares e demográficos. As descobertas oferecem percepções sobre o potencial e as
INTRODUCTION

In the midst of unprecedented global challenges posed by the ongoing pandemic, the realm of education has been confronted with a myriad of obstacles that demand innovative and adaptive solutions (MOLDAVAN; CAPRARO; CAPRARO, 2022; ZHAO; WATTERSTON, 2021). The COVID-19 pandemic has presented substantial challenges within the realm of education (BRAMMER; CLARK, 2020; KHALIL et al., 2020; BABBAR; GUPTA, 2022). The cessation of in-person classes and the implementation of social isolation measures have engendered adverse repercussions on students' mental well-being, concurrently fostering detachment and diminished enthusiasm for academic pursuits (CASTRO; JUNQUEIRA; CICUTO, 2020; RUBERT; DENES; BATTIST, 2021; MAKSUM et al., 2022; WALTERS et al., 2022).

Among these challenges, the disruption of traditional educational formats has sparked a need for inventive approaches to engage and empower high school students (MORALES et al., 2020; YEAP; SUHAIMI; NASIR, 2021). This article delves into an exploration of an innovative winter program, conceived against the backdrop of the pandemic, aimed at high school students. This experiential account details the phase of the project termed "Winter at the University." This initiative encompasses a vacation course with an emphasis on the sciences, designed explicitly for high school students.

The project's primary objective is to bridge the gap between the university and public schools, thereby contributing to societal transformation by potentially nurturing interest among high school students in research pursuits. This is accomplished through the presentation, discussion, and demystification of various scientific domains and facets. Simultaneously, the endeavor strives to engender motivation and virtually foster integration across different educational tiers, facilitating connections between high school students, university undergraduates, postgraduates, and researchers within a Brazilian public university.
By combining educational aspirations with technological advancements, this initiative not only addresses the immediate disruptions caused by the pandemic but also endeavors to revolutionize the way students perceive and engage with their learning experiences. Through the critical lens of educational theory and practice, this study examines the conception, implementation, and outcomes of the proposed program, shedding light on its potential to serve as a paradigm for future educational endeavors in times of crisis. As we navigate these uncharted territories, this article underscores the importance of creative and dynamic educational interventions that can mitigate the adverse effects of the pandemic while fostering intellectual growth and resilience among high school students.

2 ENGAGING SCIENCE EDUCATION AMIDST PANDEMIC CHALLENGES: EXPERIENCE NARRATIVE

"Winter at the University" was a project conducted during the COVID-19 pandemic period. As a consequence, all its stages, from the initial announcement to the selection process and the execution of the intensive vacation course, were executed remotely. Consequently, the project’s promotion took place online, utilizing email distributions to Regional Education Directors in the State of São Paulo, as well as coordinators of Technical Schools (ETECs). Additionally, project information was disseminated across social platforms such as Facebook and Instagram (#invernonauniversidade) (Figure 1).

Figure 1. Divulgação the project on social media

The selection phase took place from May 13 to 21, 2021, utilizing Google Forms as the platform. This stage comprised a composition contest, wherein candidates were required to expound upon the following inquiries: What is the significance of science in our lives? How does one become a scientist? And why do I deserve to partake in this project? Through this process, 40 high school students were chosen, representing all five regions of Brazil. The candidate-to-seat ratio stood at 3.92, and expansion of the participant pool proved infeasible due to the inherent demands of the remote nature of the program. Notably, the curriculum encompassed daily exercises and challenges, necessitating prompt evaluation and feedback.

The winter course took place from July 5 to 9, 2021, encompassing a total of 40 instructional hours. The course's commencement ceremony featured the participation of the deputy director of the institution, alongside faculty members, undergraduates, postgraduates, technical-administrative staff, as well as school directors, pedagogical coordinators, select teachers, and parents of the students engaged in the project.

The course's structure was as follows: throughout the week, the project coordinator conducted synchronous morning sessions wherein the day's activities were introduced. Subsequently, two instructional videos pertaining to the afternoon classes were presented, each accompanied by associated "challenges." These challenges were deliberated upon synchronously with the teaching staff and/or postgraduates during the afternoon sessions (Figure 2). Undergraduate students, under the guidance of the project coordinator, served as monitors, constituting the support team.
Active teaching methodologies, including the flipped classroom approach, were employed. Virtual classrooms, virtual laboratories, and activities within the Google Classroom platform were integrated, featuring various challenges during the morning period.

At the conclusion of each day, the activities and challenges were assessed, with the students exhibiting superior performance earning points toward awards distributed on the course's final day. Additionally, a questionnaire was administered to allow students to evaluate the lessons and activities themselves, thus articulating their perceptions regarding the course.

On the final day, during the morning session, a synchronous lecture was conducted titled "Trajectories of Postgraduates, Undergraduates, and Former Participants of the Winter Course." Subsequently, a task grounded in the realms of neuroscience and neurolinguistics was proposed. In this task, students were prompted to expound upon the question: "Where do I envision myself one year, five years, and ten years from now?"

Upon the culmination of the course, following the motivational lecture titled "The Secret to Success," the closing ceremony took place. This event featured a virtual "food and drinks"
segment, accompanied by students' testimonials. The concluding act comprised the recognition ceremony, encompassing daily awards throughout the week and the acknowledgment of the outstanding student of the course. Medals were bestowed upon the students, designed and sent via email.

Despite the manifold challenges stemming from the pandemic period, the "Winter at the University" course facilitated a meaningful convergence between the university and public schools across diverse regions of Brazil. The feedback from participating students underscored that engaging with academic and scientific dynamics, even in a remote capacity, represented an innovative approach. This approach enabled students to envision the multifarious opportunities that the realm of science can provide, thereby harboring transformative potential within the lives of these young individuals.

3 TRANSFORMATIVE LEARNING IN REMOTE TIMES

The "Winter at the University" project stands as a commendable endeavor that sought to navigate the intricacies of education during the COVID-19 pandemic. The decision to execute all phases remotely in response to the pandemic-induced challenges is a testament to the adaptability and resilience demonstrated by educational institutions. The utilization of online platforms for project promotion, involving email outreach to educational authorities and social media dissemination, reflects a contemporary approach to engage a wider audience. This strategic outreach showcases the project's responsiveness to current communication channels, fostering accessibility and inclusivity.

The selection process, administered through Google Forms, presented an equitable method to identify potential participants from a diverse applicant pool. The requirement for candidates to articulate their views on science's significance, the path to becoming a scientist, and their suitability for the project is indicative of a thoughtful selection criterion that aligns with the project's objectives. The chosen participants, representing various regions of Brazil, highlight the project's national scope, fostering a sense of inclusivity and diversity.

The instructional design of the course is well-structured, blending synchronous morning sessions, instructional videos, and interactive "challenges." This synthesis of methods caters to different learning styles and maximizes student engagement. The integration of active teaching methodologies, virtual laboratories, and flipped classroom techniques showcases an innovative
pedagogical approach. The involvement of undergraduates as monitors adds a peer-learning dimension, further enhancing the learning experience and student interactions.

However, despite its merits, the project is not without limitations. The virtual nature of the course, while necessary given the circumstances, may not fully replicate the immersive educational environment of an in-person experience. While the course effectively fostered interest in science among participants, the potential for hands-on experiential learning might have been constrained by the remote format.

The project's successful execution highlights the efficacy of remote learning models, though the inherent limitations of such formats must be acknowledged. The project's emphasis on inclusivity, engagement, and interdisciplinary connections augurs well for future educational initiatives, as it encourages active participation, fosters curiosity, and fosters transformative potential within the participants' lives.

4 LESSONS LEARNED AND FUTURE DIRECTIONS

The initiative has yielded valuable insights that can contribute to the advancement of educational practice. Among the key lessons extracted from the project's execution, can be highlighted the following:

- adaptability amidst adversity: the project's seamless transition to a fully remote format underscores the significance of adaptability in educational initiatives. The ability to swiftly modify and tailor educational strategies to dynamic circumstances emerged as a pivotal determinant of success.
- student-centric engagement: the project accentuates the potency of student-centered engagement strategies. The diverse array of activities and challenges fostered sustained student participation, underscoring the importance of crafting interactive learning environments that facilitate proactive student involvement.
- strategic technological integration: the seamless integration of technological tools, ranging from virtual platforms to instructional videos, emerges as a key facilitator of the project's triumph. This highlights the strategic importance of embracing technology to enrich learning experiences and amplify student interaction.
- continuous assessment and timely feedback: the incorporation of ongoing formative assessment and rapid feedback mechanisms proved pivotal in maintaining
student motivation and refining the learning process. Daily assessments and immediate feedback served as catalysts for student engagement and adaptive content delivery.

- Diversity and inclusivity: the project’s participation from various regions of Brazil emphasizes the significance of inclusivity and diversity in educational initiatives. This reinforces the imperative to design educational programs that provide equitable opportunities, fostering cross-pollination of perspectives and ideas.

As future directions for further studies, several recommendations emerge from the analysis of the "Winter at the University" project:

- Long-term impact analysis: a longitudinal study tracking the participants' educational and career trajectories could reveal the lasting effects of the project on their academic pursuits and personal development.

- Comparative analysis: a comparative study contrasting the outcomes of remote learning initiatives like "Winter at the University" with traditional in-person programs could shed light on the efficacy and limitations of each approach.

- Qualitative inquiry: in-depth interviews or focus groups with participants could provide nuanced insights into their experiences, capturing the nuances of engagement, challenges faced, and perceived benefits.

- Learning experience design: future initiatives could incorporate innovative techniques to bridge the gap between remote and in-person learning, leveraging technology to facilitate immersive experiences and hands-on engagement.

- Impact on university-community relations: investigating the broader impact of such projects on the university's relationship with local schools, communities, and educational policies could unveil avenues for enhanced collaboration and mutual benefit.

- Cross-disciplinary exploration: expanding the project to include various academic disciplines could provide a holistic understanding of its adaptability and efficacy across different subject areas.

- Socioeconomic and demographic analysis: exploring how socioeconomic backgrounds and demographic factors influence participation and outcomes could inform strategies for addressing educational disparities.

- Teacher training and integration: Studying the impact of including teachers in similar initiatives could provide insights into how educators can be trained and integrated.
into such projects to enhance their effectiveness, and

- technology adaptation: investigating the adoption and adaptation of technology among participants could offer insights into the digital readiness of students and potential areas for improvement.

By pursuing these recommendations, future research can build upon the foundation laid by the "Winter at the University" project, contributing to the advancement of remote education strategies and their impact on student engagement, learning outcomes, and educational policies.

5 CONCLUDING REMARKS

In conclusion, the "Winter at the University" project stands as a testament to the capacity of education to transcend challenging circumstances, even within the throes of a global pandemic. By meticulously adapting to remote formats, this initiative successfully bridged the divide between higher education institutions and public schools across various Brazilian regions. Through a strategic blend of active teaching methodologies, virtual platforms, and engaging activities, the project not only achieved its initial goal of fostering curiosity and interest in science among high school students but also demonstrated the potential for innovative approaches to reshape educational paradigms.

The project's emphasis on fostering interdisciplinary connections, evident in the collaborative involvement of undergraduate students, postgraduates, and university staff, showcased the potential of unity across educational levels. The culmination of the course was marked not only by accolades but also by the empowerment of participants, who were inspired to envision their futures through the lens of scientific inquiry. Such an experience resonates beyond the virtual walls of the classroom, as it equips students with a transformative outlook on the opportunities and possibilities that the realm of science can provide.

As the education landscape continues to evolve, the "Winter at the University" project serves as a beacon of innovation and adaptability. It exemplifies the importance of curating dynamic learning environments, even amidst adversity, to stimulate intellectual growth and encourage aspiring young minds to embrace the transformative potential of education. Moving forward, it is imperative that similar initiatives are celebrated and replicated, underscoring the profound impact that purposeful educational endeavors can have on the lives of students and the advancement of society as a whole.
FUNDING

Pró-reitoria de Extensão da Universidade Estadual Paulista “Júlio de Mesquita Filho”– PROEX-Unesp

DECLARATION OF USING GENERATIVE AI

During the preparation of this work the authors used ChatGPT by OpenAI, July 20 Version, in the writing process to improve language and readability. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.
REFERENCES


