Leveraging E-learning to Support Student Engagement

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ABSTRACT
This paper delves into the imperative of leveraging eLearning to address heightened challenges in student engagement during the Covid-19 pandemic. As traditional lecture methods were questioned, the multidimensional nature of student engagement underscored the need for intentional design in electronically supported learning activities. Defining eLearning as an umbrella term encompassing various online and digital learning forms, the paper focuses on supplementing face-to-face instruction. While Learning Management Systems (LMS) serve as eLearning avenues, the choice of an LMS alone does not ensure positive engagement, as highlighted by challenges such as poorly designed materials and unclear expectations. To optimize eLearning, varied activities catering to different learning styles are essential, aligning with strategies such as interaction, exploration, relevancy, multimedia, engaging instruction, and authentic assessment. The paper introduces promising eLearning applications, including the STACK system and PHET simulations, and emphasizes community building through conferences and institutional initiatives. It concludes that a multifaceted approach and communities of practice are crucial for designing eLearning activities that effectively enhance student engagement, offering a roadmap for educators navigating the dynamic landscape of modern education.

Keywords: *Leveraging E-learning, students' engagement, Covid-19 pandemic.*

1. INTRODUCTION

One of the instructional challenges that the Covid-19 pandemic made more pronounced was student engagement. As instruction moved online, the adequacy of lecture methods that assume student engagement was questioned, as instructors considered how to leverage available electronic resources to support learning. Student engagement has a direct bearing on learning outcomes and student achievement [1], and thus should not be assumed. Student engagement is complex, multidimensional and has been defined in various ways and at different levels [2].

According to Groccia the dimensions of engagement that are important for the learning process are behavioral, cognitive and affective which exacerbates the complexity of student engagement as students can potentially engage positively in one or two levels and negatively in another. Even though, the idea of involvement is a common thread in the different definitions in the literature review by Groccia, 2018, educators have to be intentional when planning for instruction and consider characteristics of the learning activities that can drive involvement such as interest, motivation, relevance, connections all which contribute to the varied definitions of student engagement. Intentionality is even more critical when the learning activity is electronically supported, because it gives more ownership of the learning process to the student, and one has to ensure that it is designed to enhance learning and not simply replicate the classroom lecture. Optimal use of electronic learning platforms to enhance learning therefore requires careful planning of learning activities. In this paper we consider how instructors can leverage eLearning to enhance student engagement.

2. FINDINGS AND DISCUSSION

2.1 What is eLearning?

e-Learning has been defined in various ways by different authors [e.g. 3,4,5] with some authors looking at eLearning as instruction that is facilitated entirely online or as distance learning. [6] describes eLearning as an umbrella term that includes online learning, digital learning, computer assisted learning, computer supported collaborative learning among others. OECD [7] provides a comprehensive definition of eLearning which defines eLearning as the use of information communication technologies (ICT) to support and enhance learning in institutions of higher learning and includes use of ICT in online learning and a mixture of online and face-to face learning. According to [7] face to face programs continue to dominate undergraduate instruction where eLearning is used to supplement face-to-face instruction. The

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focus of this paper is on use of eLearning in contexts where it is used to supplement face-to-face instruction.

Learning Management Systems (LMS) are one of the avenues of eLearning and sometimes the term eLearning is loosely used to refer to a learning management system. There are a variety of learning management systems: Proprietary LMS (Black Board Learn, Design2Leran); Open Source LMSs (Moodle); Cloud Based LMSs [8]. The choice of a LMS is based on considerations of cost, flexibility, infrastructural needs. However, the best choice of LMS by itself does not guarantee positive engagement for students.

[9] in a study in Bangladesh found that students are enthusiastic about online platforms however there are several institutional limitations. Challenges included poorly designed materials that did not support student-instructor interactions. The study by [9] also reveals the importance of instructors making clear the purpose of online work and the expectations from online activities. Therefore, in addition to adequate infrastructure for eLearning, there is need for careful and intentional design of learning activities to enhance students' learning experiences on online platforms.

2.2 Optimizing eLearning to enhance student engagement

Studies on student experiences with eLearning reveal varied results and point to the need to vary activities to take care of the different learning styles of learners. Use of discussion groups, and assessments that allow for different types of responses, matching activities, drag and drop features and videos all which are supported by most LMS can potentially address the varied learning needs. [10] from a review of the literature on strategies for improving engagement synthesize the following categories of strategies: interaction, exploration, relevancy, multimedia, engaging and challenging instruction, and authentic assessment. In this next section we share some online applications that have the potential to support these strategies.

OECD, 2005 propose building a community of adopters and partnerships where people can share knowledge, experience, good practice and scale up successful experiments with eLearning. An example of this is the African STACK Community that was formally constituted earlier this year during a conference on the use of STACK in undergraduate mathematics assessment. During the conference participants shared their experiences on using STACK and results of studies they had conducted using data from student assessments. One of the positive outcomes of the use of STACK shared by most of the participants was the facilitation of meaningful assessments for large classes. STACK – **S**ystem for **T**eaching and **A**ssessment using a **C**omputer algebra **K**ernal is used in many disciplines. It supports formative assessment in Mathematics and related disciplines such as Physics. STACK allows for algebraic answers, students get validation of their responses before they are marked so that they are not penalized for not being able to input their answers in the required format. Students are also given feedback for their specific answer and mistake. To mitigate the challenge of plagiarism in assignments, STACK generates random questions so that every student gets a different question but at the same level. It is available in most European languages and Japanese. It is open source and therefore free to use. Educators can contribute towards making it better, authoring questions in different topics. Discussion forums can be embedded to allow for interaction among students and also with the instructor.

Another community that is growing rapidly is that of educators using PHET (originally Physics Education Technology) simulations of not only Physics but currently Science, and Mathematics. See https://phet.colorado.edu/ The simulations are interactive, allow for exploration and give students feedback as they interact with them. They can be embedded on learning management systems. Educators can also gain from periodical conferences that target users of specific eLearning tools such as Moodle Moot Global 2023 that was recently held in Spain. Moodle Moot Africa was held in August2023. The aim is to bring together educators who use Moodle to share best practices, experiences and to enhance the quality of eLearning.

Colleagues within our institutions are a great place to start building communities of practice to give us much needed support to adapt to the dynamic learning environment that is today's college classroom. In our institution Covid 19 motivated the need to be intentional about sharing knowledge and ideas related to teaching as we grappled with how to engage students online. The Centre for Teaching Excellence started a weekly 25-minute Monday morning meeting, titled *Coffee in a gulp* that has continued beyond the pandemic. The meetings continue to be a place for discussion on how to enhance students' learning experiences and to adapt to the emerging trends in education. More importantly the meetings have motivated us to reflect and research on our instructional practices as educators.

3. CONCLUSION

Designing eLearning activities that enhance student engagement, requires a multifaceted approach that can take care of diverse learning needs that students bring to our classrooms. Enhancing student engagement requires activities that align with [10] categories of strategies to facilitate interaction, exploration, relevancy, multimedia, instruction and authentic assessment. Communities of practice are important to support building of a knowledge base for new initiatives in student engagement and supporting faculty in effective implementation of such initiatives. Finally, an important way of contributing to the Communities of practice is by researching our own practice as we implement new initiatives in the courses we teach.

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