

Collaborative E-Learning – Bringing Social Accountability into Online Learning

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Abstract: The educational landscape is evolving too fast to be noticed, with e-learning and MOOCs pushing this evolution forward. The project the team is trying to develop, called Let's Learn Together, takes into consideration this evolution of learning path, as well as how e-learning is shaping the education system, and provides an overview of different e-learning methods such as group e-learning, e-teaching, e-tutoring, etc. E-learning is used by all types of people, whether they are at home or on the move. E-Teaching is E-learning's natural companion for companies and employees across industries, as well as students with teachers. E-Learning is not only about e-training; e-tutoring (or group e-learning) has gained momentum as a promising method that has shown to improve students' results. It seems like MOOCs are here to stay since their popularity has been recently growing exponentially in universities around the world. In addition to e-teaching, there are other methods such as blended learning, flipped classroom or gamification which have been making their way into the educational system too. The educational landscape will surely be different from what we know it today.

Keywords - E-Learning, MOOCs, tutoring, group learning

I. Introduction

Information technology has had a significant influence on the shift to e-learning as a modality of instruction. E-learning education is one in which students are taught via the use of technology. Learning management systems (LMSs), which are extensively used to offer organized course content and other learning resources online, enable e-learning. Filmed lectures, texts, and problem sets are all part of the e-learning course resources. With the emergence of MOOCs, the scope of e-learning has expanded. "Massively Open Online Courses" or "MOOCs", forshort, are very useful and important with many of them having unrestricted access for all. Apart from standard e-learning materials, some MOOCs also provide interactive courses to encourage student, professor, and teaching assistant interactions. These often include things such as user forums and discussion boards on social networks.

An archive of these exchanges is kept during e-learning. These data are utilized as a data source in the disciplines of educational data mining and learning analytics to look at things like learning outcomes, learning behaviour, learning sentiments, and e-learning course success.

There is little doubt that e-learning and MOOCs have brought major benefits in offering cost-effective access to a wide selection of courses to a big audience, even in remote areas. In the present pandemic outbreak, this advantage is more apparent.

With all of the advantages that e-learning and MOOCs have to offer, there has also been a significant drawback. According to studies, the "majority of courses have completion rates of less than 10% of those that enroll, with a median average of 6.5 percent." (Jordan K, 2014)

II. Current Limitations

This project has attempted to address the current limitation of e-learning:

- Firstly, one can find the brief summary of several research papers (presented in the 'Literature Survey' section) to understand the nature of the problem and come up with possible solutions to address this limitation.
- The proposed solution is to have collaborative learning along with bringing social accountability to online learning.

An online classroom is divided into smaller groups based on the numerous aspects that go into generating effective collaborative learning groups. This project aims to assign a weight and value to numerous elements that influence group studying and learning, which can be tracked and utilized for collaborative learning and motivation.

As a result, there would be a stronger feeling of community, more skill development, and improved learning outcomes.

III. Literature Survey

A. Effects of realistic e-learning cases on students learning motivation during COVID-19

(Published-2021Plos One)

Authors - Ann-Kathrin Rahm, Max Ole Hubert, Katrin Klein, Tim Sauer, Cyrill Wehling, Selina Hein)

Covid-19 has resulted in humanity going through some incredibly trying times and running into a number of issues. When you're socially isolated during a pandemic, it's tough to stay motivated to study. Despite early data indicating that students in medical institutes enjoyed offline interaction and training in clinical settings, the pandemic necessitated a complete shift to e-learning in medical schools, with no direct and face-to-face engagement. In order to convey “competency-based learning” material to students and analyze their reactions, the study designed patient e-learning modules that were as realistic as feasible. Students' drive was raised during the pandemic by solving and analyzing e-learning scenarios that were close to real-life settings, which may have partially compensated for the shortage of bedside teaching opportunities.

Methodology— Simulated e-cases were created on a weekly basis for a period of 10 weeks by a group of students and doctors. Internal medicine is one of the sources of study in medical education, specifically in the Heidelberg University. Emergency medicine or ER, in hospital and out-of-hospital care, and patient follow-up were all part in the course structure and design. This was all based on real experiences. When cases were finished, they were immediately evaluated online. End semester exams were when modules were graded fully. “Mayring's qualitative content analysis” approaches were utilized to analyze free-text replies using “MaxQDa”.

Outcome— 198 students provided 1252 individual case assessments (ranging from 49.5 percent to 82.5 percent for each case) and 51 end-of-term evaluations (25.8% of students). Because of the clinical setting, engagement, a scenario based on games and integrated learning opportunities, students were incentivized to engage with the delivered learning materials and work.

B. Exploring the role of social media in Collaborative learning the new domain of learning

(Published - 2020Springer Nature)

Authors - Jamal Abdul Nasir Ansari, Nawab Ali Khan)

This study looks into the role social media plays in sharing of resources and connecting with academics outside of institutional borders at higher education institutions, a hitherto untapped subject of research. This is based on a survey of 360 students, who were plucked from a college in east India. The goal is study and investigate how students view social media in a learning system, including things such as collaboration, peer communication and impact on already existing educational systems. In order to measure and validate the instrument, a “latent variance-based structural equation model” was used. According to the findings, using social had a big influence on peer interaction, teacher interaction, and online knowledge sharing behaviour.

It is also mentioned that adopting social media as a means of learning helps students become more creative and dynamic. Students also end up being far more interested in research. It is only a sphere of knowledge. The advantages of using social media for acquiring course information, video clips, and exchanging instructional notes, among other things, are well acknowledged. The purpose of this research was to evaluate how mobile device integration and utilization in sharing things such as notes for studying, communicating with colleagues, and educational goals affects learning and teaching at universities.

Methodology— This was conducted on a sample space of students who attended a university in east India. They were polled both offline and online to examine their impressions of social media and the prospect of using it for learning collaboratively or in groups within universities and colleges. Indicators of student and teacher interaction, student engagement aspects, and a statement on the use of social media for this purpose were adopted for the study. The indicators for all of the following factors are based on a standardized “seven-point Likert scale.”

Outcome— All possibilities provided were proven right. When other variables are taken into account, there is a strong link between social media collaborative learning and instructor interaction, implying that social media has a direct impact on teacher involvement. On the other hand, social media as a learning tool and outlet has been connected to a statistically significant increase in collaborative learning, meaning that university students using this method tended to form strong bonds with their coworkers. Based on a 10% increase in utilization of learning tools within social media, a 7.04% increase in collaboration is expected.

C. Trends in student behaviour in online courses

(Published - 2017)

Proceedings of the 3rd International Conference on Higher Education Advances Authors - Rianne Conijn,

Menno van Zaanen)

The relevance of learning management systems in giving simple and effective access to learning resources was discovered in this study. The level of interaction between students and course materials is regarded to be a proxy for student participation. Prior research has usually used frequency of student activities; however, this overlooks any time information. The amount of student involvement in class is investigated over time in this article. Based on activity data from 11 online courses, it classifies students who display similar behaviour over time. As a consequence, three separate groups emerge: a large number of mostly inactive students; a group of students who are extremely active throughout the course; and a group of students who are active at the start of the course, but their activity diminished throughout. These students put up a show in a number of ways. In general, pupils who are more engaged achieve more. In addition, the study discovered courses with unusual patterns, such as a group of students that became increasingly engaged during the course. This shows that student behaviour is more complicated than can be established from a single course, needing deeper research on learning activity patterns over many courses. It helps project validation and fosters the growth of collaborative learning through group learning.

Methodology— Data was gathered from the Canvas Network Courses and open-sources set. It was then pre-processed utilizing R. The analysis of the data was done by clustering of activities in 11 groups.

Outcome— The first step was to look at the clusters of sequences from all 11 courses. Students' activity sequences were discovered to fall into three distinct groupings. Clustering into additional clusters resulted in clusters with gradations across clusters rather than new patterns.

D. Designing MOOCs as Interactive Places for Collaborative learning

(Published - 2015)

Association for Computing Machinery.

Authors- Saijing Zheng, Mary Beth Rosson, Patrick C. Shih, John M. Carroll)

According to this survey, the Massive Open Online Courses have evolved quickly and piqued the interest of many. Regardless, students taking part in MOOCs have a suboptimal and negative learning experience. A high dropout rate in MOOCs has been linked to a lack of community and restricted alternatives for collaboration, according to many studies. In light of these concerns, the study is looking into new design elements that might promote better social interactions, collaborative learning, and communal feelings. It conveys design principles through a succession of activity design scenarios, as well as a look at the design's possible benefits and downsides. Increased attention may be achieved through collaborative learning and social interactions.

Methodology— MOOC students have a wide range of backgrounds, value systems, and personal goals. If sub-grouping is possible, the population's variety may combine, emerge, form, and contribute to the broader community's richness and tenacity. Subgroups enable smaller-scale activities like idea exchange, brainstorming, identity creation, and in-depth discussion, all of which help the wider community.

Outcome— In the future, there was plans to develop prototypes and analyze MOOC data in our institution to more directly explore the scenarios and tradeoffs. For example, creating and testing several choices for students to enroll in and join a classroom, to determine if time zones and course incentives are a useful and adequate sub-grouping strategy, and how crucial it is for students to have influence over their own class assignment process.

E. Creating Effective Collaborative Learning Groups in an Online Environment

(Published - 2009)

Athabasca University Press (AU Press).

Authors - Jane E. Brindley, Lisa M. Blaschke and Christine Walti)

Learning through collaboration can take the form of whole-class or small-group conversations in an online classroom. This study investigates the latter, first looking at how learner engagement is influenced by assessment, and then looking at the other aspects that go into forming effective collaborative learning groups. Students will receive a basic understanding of learner assistance while also completing assignments that will help them develop progressively sophisticated abilities. The research focuses on particular instructional practises that encourage student engagement in small group projects, resulting in a greater feeling of community, enhanced skill development, and improved learning outcomes. This enhances collaborative learning while also setting the foundation for a core course.

Methodology— Online courses were conducted using WebTycho, a proprietary platform from UMCS. It allows for direct communication, as well as collaboration using an online chat forum, and docs. This is especially useful for smaller groups.

Outcome— This study emphasizes the necessity of educators engaging in reflective practice. Assumptions regarding the influence of certain tactics on learner behavior must be evaluated on a regular basis. In this situation,

it appears that instructional tactics are as beneficial. Instructional practices that were specifically designed to improve group learning showed additional benefits. These include helping students in achieving a better understanding and cultivating confidence in their own abilities.

F. Learning Together: Exploring Group Interactions Online

(Published- 2004AU Press

Authors- Martha Gabriel)

Recent research on online learning have emphasized a “constructivist approach to knowledge-building in Web-based contexts”. In this case study, students were introduced to this approach during an online course, which facilitated a necessity to learn in a new environment, and a challenge to work in teams with their colleagues. The pupils met these requirements to a satisfactory degree. Participants in this research learnt to communicate, cooperate, engage, and participate in their online course using a framework of communication, cooperation, interaction, and participation. They used a constructivist learning method, which required them to interact, cooperate, engage, and participate in their learning environment on a regular basis. While the learning was challenging, the students got unexpected benefits in terms of independence and laid down future plans for e- learning courses in their lives. Participants claimed that they were able to learn more quickly since they were all aware of each other's learning processes and could learn from one another. The participants found that they preferred working in groups, or collaborative environments. All eight participants believed that their online cooperation and three face-to-face encounters had resulted in a solid community of learners at the end of the course. Students' feeling of self-efficacy and developing commitment to this “constructivist approach to learning” were aided by their communication skills, engagement with one another, interaction throughout the course, and frequent attendance in class

Methodology— In this study, qualitative and quantitative means were used to collect data. This data, that formed the basis of the study, had things such as audio interviews and their respective transcripts. There was also the analysis of the notes taken down by students in the lifetime of the course. Instructors can use the Toolkit to assess basic knowledge-building metrics.

Outcome— According to the Analytic Toolkit's analysis, there were 527 total notes in the database. This came mostly from a sample space of 8 students. Notes that one person has written are connected to other notes as well. Build-on notes, comments, and referrals to other notes are examples of these linkages. The percentage of connected notes was 77.5%; these linkages show that the writer read and reflected on the notes. Not enough students are still enrolled in online courses, and amongst them, not many finish the course fully. The sample space of 8 students did successfully finish the course, satisfying the requirements.

IV. Objectives

A. Allow users to bring in their own learning materials

Users are allowed to bring in their own learning materials and resources, such as online courses bought on other e-learning sites (Udemy, Coursera, etc.). Users are also allowed to bring in their own content in the form of cloud links to Google Drive.

B. Create groups with likeminded learners.

If there are multiple learners interested in pursuing the same line of learning in a particular field, the platform allows these users to create their own group and pursue their interest at will.

C. Account for proper data storage and authorization.

The platform will maintain records of all the data related to a particular user, such as their resources, their group etc. in a relational database. Any individual must be authorized to use or even look at this data.

D. Bring in accountability for learning in a set timeframe.

The groups are modelled after the classic learning systems of classrooms, hence there is a set time limit for the lifespan of each group after which it is archived and can no longer be interacted with. This accounts for responsibility of individual learners.

E. Gather questions and updates from peers.

Each member in a learning group is encouraged to ask questions to increase the overall thinking capacity of the group and also receive updates of the learning progress.

V. Future Plans

1. **Planning:** Working out plans for each development module. Planning each module of the platform, such as user modules, groups modules and so on. A module, in this case, refers to all controllers and models related to a particular theme, as well all data tables and UI screens.
2. **Development:** Coding and implementation. Putting the ideas and conceptions from the plans into code to being implementation of the first prototype and then using it to see what changes are required, and so forth.
3. **Testing:** Making sure the product is bug free. Implementation and testing are an iterative process in Agile, and hence the previous step and this one is conducted over and over again. As soon as each module is coded, it is tested for bugs and improvements to see what changes are necessary to be made.
4. **Optimization:** Ensuring that each iteration of a module in the application works optimally, with low load times, no jitter, no bugs and high usability and reliability.
5. **Modules planned:**
 - **Group module:** Features related to the creation and joining of groups.
 - **User module:** Modules related to the log in of existing user and sign up of new users, as well as authorization modules for these operations.
 - **Resource module:** Storage of resources brought in by all users, into multiple groups, their addition and removal at multiple levels and so on.
 - **Questions and feedback module:** Features for flow of information among peers of a group, and from the users to maintenance team of the website as well.
 - **Machine Learning modules:**
 - i. **Tag module:** To provide personalized recommendations to the users with respect to joining relevant groups or following like-minded users. This will drastically improve the user experience and will help them in creating the kind of environment that is optimal to them with little to no noise.
 - ii. **Sentiment analysis module:** Analyze the sentiments of the users and use that as feedback to assess not only a group's performance but also a learning resource's performance

VI. Conclusion

The product is intended to be a rehashing of a very important thing: solving the problem that many have with learning, and this product is being developed to make sure it can be cared for. It is a way to migrate the educational system in present currently in the world; studying with others, in a contained time frame, to the online sphere. If last 2 years have presented any observations, it's the fact that the systems in the world have a few holes in it, and when faced with a dire situation to deal with, it started crumbling. This product is meant to be a failsafe, to make sure that anything like that can be avoided in the future.

Imagine having this tool at the beginning of the pandemic. Distribution of information and recollection of feedback from students would have been much easier. A lot of time would have been saved; the time wasted scrambling to find tools to fit the niche. The main goal of this product is making sure that people are constantly improving themselves and gaining expertise in whatever makes them happy, while making sure that they enjoy the whole process, ensuring that they don't give up due to unmitigated circumstances.

Learning with others, learning something new and learning at a controlled pace and learning in general is something that is the core of the project. Promoting this type of learning improves the collective by making sure the individual is responsible and accountable for it.

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