Effect of Virtual Activity and Game-Based Learning Techniques in Effective Teaching of 'Professional Ethics'Course

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Abstract: COVID-19 pandemic has created a need for adapting to online teaching, making this the era of Digital Pedagogy. The switch to the online mode makes tutors not use their usual chalk and board methods, creative flashcards, charts, models and creates urges to switch for online materials. Professional ethics is a common humanities course across all engineering courses offered in multiple Engineering educational Institutions. This course requires more activity and game-based learning than formal lecturing for understanding the basic concepts. This article illustrates the list of various online tools and their roles in interactive teaching for this course. The implementation and impact of this teaching-learning technique to this course were discussed here briefly. Based on the student feedback from the 36 Biotechnology undergraduate students who learned this course under this method it was clear that the learning environment was more interactive and engaging. Thus, based on the learning outcome observed at the end of this course, it was evident that the use of such a teaching method helps the learners have more interaction and learning. The faculties and institutions offering this course could adapt similar teaching practices to enhance their teaching-learning process.

Keywords: Gamification, Professional ethics, Activity based learning, Online class

1. Introduction

The education industry is the one that got a huge evolution due to the impact created by the COVID-19 pandemic. The teaching-learning process was switched over to online mode putting both the tutors and learners in a blindfolded situation. To meet this circumstance, the teaching community is putting out its full effort by learning and implementing various online tools and techniques in their online lecture sessions (Mishra et al., 2020). The ultimate goal for all these tutors is to achieve effective teaching-learning for their courses.

There are many online teaching platforms and tools available to create an effective learning atmosphere. But the selection of the right tools and implementation of the same is the challenge for the tutors (Bailey and Lee, 2020). The 'Professional Ethics' course has been offered as compulsory course to undergraduate engineering students in almost all the premier engineering institutions of India (Sethy, 2017). In this article, we have highlighted and outlined the above-mentioned online tools concerning

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the implementation of these tools made for the course 'Professional Ethics'. Irrespective of the various meeting platforms used for online classes, the way of presentation matters the most for achieving a better learning environment. The use of interactive presentation, online tools like Pear Deck, Mentimeter and Google spreadsheets has shown increased learner interest during the class sessions. Also, for performing interactive activities and virtual games, there are multiple online portals available specifically for this course.

2. Need for activity and game based teaching and learning

The era of passive learning is over and now it's the era of active learning (Roberts, 2019). The current generation students have multiple options to learn a course such as Coursera, edX, NPTEL, Youtube, etc., (Aithal and Aithal, 2016). So, it puts a new task in front of the faculty, as they have to go the extra mile to attract students to their classes. Besides this, the current generation students have less interest in lectures and they need more hands-on sessions (Haseeb, 2019). Thus the regular classes themselves need more activity and game-based learning.

Nowadays, online classes can be stressful and less interesting for students if it doesn't handle properly. Thus, it's the utmost responsibility of the faculty handling the course to make every online session more interesting and interactive. To create interest in the course we need to move out of our comfort zone of just lecturing and start working on conducting more online activity sessions for the participants. If we share or conduct online activities and online games relevant to the topics, the students may start participating in your classes more actively. When active participation is established then the effective learning of the topics happens automatically.

3. Course Design and Implementation

The Professional Ethics course was offered to the third year B.Tech students as a humanities elective course that carries 3 credits. Around 36 students undertook this course in online mode which was offered by the author. The course consists of 5 modules with 9 hours of teaching for each module leading to a total duration of 45 hours to complete this course. The course had a total of 5 Modules with each module containing various topics which is listed in the Table 1.

Table 1 : Module and Topics

Module No.	Topics
1	Functions of Being a Manager, Skills of a Manager, Stock hol der and stakeholder management, Ethical treatment of employees, ethical treatment of customers, supply chain management and other issues.
2	Senses of Ethics, Moral dilemmas , Moral Autonomy, Kohlberg's theory , Gilligan's theory, Consensus and Controversy , Professions, Professional ideals and virtues , Theories about right action, Self-interest, Customs and religion, Use of Ethical Theories
3	Corporate social responsibility - Collegiality and loyalty , Respect for Authority , Collective Bargaining, Confidentiality, Conflicts of Interest, Occupational Crime , Professional Rights, Employee Rights , Discrimination, Whistle Blowing
4	Moral imagination, stake holder theory and systems thinking, One approach to management Decision, making Leadership
5	Multinational Corporations , Environmental Ethics, Computer Ethics , Weapons Development, Engineers as Managers, Consulting Engineers , Engineers a s Expert Witnesses and Advisors, Moral Leadership, Sample code of conduct

The learning objectives for this course are described below:

1. Students will understand the importance of values and ethics in their personal lives and professional careers.

2. The students will learn the rights and responsibilities.

3. Students will realize the responsibilities of employee, team member and a global citizen.

4. Students will develop leadership qualities and able to identify various stakeholders of a organization.

A. Planning of Virtual Activity based Sessions

The virtual activities planned with its corresponding topics and tool is provided in the below Table 2.

Pear Deck

It is an add-on used with Google slides. It is a powerful interactive presentation tool that allows real-

Table 2 : Virtual Activities

Module No.	Topic from the Module	Tool used for Activity
1	Functions of the Manager	Pear Deck (Scenario discussion)
1	Responsibility towards employee	Mentimeter (QA session)
1	Stakeholder Management Plan	Pear Deck (Scenario discussion)
1	All Topics	Puzzle.org (Crossword Puzzle) Wheel of Names (Pick Student for Interaction)
2	Senses of Ethics	Pear Deck (Scenario discussion)
2	Theories about right action	Pear Deck (Scenario discussion)
2	All Topics	Puzzle.org (Crossword Puzzle) Wheel of Names (Pick Student for Interaction)
3	Respect for Authority	Mentimeter (QA session)
3	Whistle Blowing	Pear Deck (Scenario discussion)
3	All Topics	Puzzle.org (Crossword Puzzle) Wheel of Names (Pick Student for Interaction)
4	Stakeholder theory	Pear Deck (Scenario discussion)
4	All Topics	Wheel of Names (Pick Student for Interaction)
5	Multinational corporations	Mentimeter (QA session)
5	Engineers as managers	Pear Deck (Scenario discussion)
5	Computer Ethics	http://ethicsonlineireland.weebly.com/online-ethics-game.html
5	All Topics	Wheel of Names (Pick Student for Interaction)

time slide sharing with the participants (Javed and Odhabi, 2018). The facilitator can choose an instructor-paced activity if he wants to regulate or control the flow. The other option is a student-paced activity where the individual students can perform the activities at their speeds. In this course, we used this tool to create interactive Q&A sessions based on scenarios specifically for the topic. The key feature of this tool is this can be linked with our Google slides presentation, hence doesn't require moving out of the presentation. Some of the sample Pear Deck slides images used for this course are given below in Fig. 1 and Fig. 2.
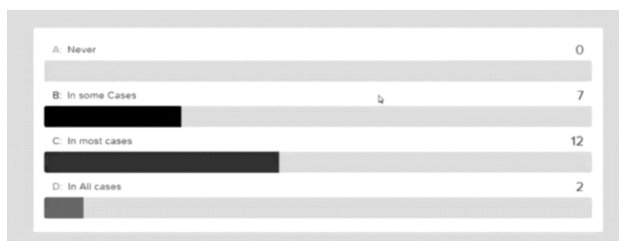
Mentimeter

Mentimeter is an online polling tool. It is used to conduct online polls, Word cloud, and MCQ questions live (Rudolph, 2018). The one drawback of this tool
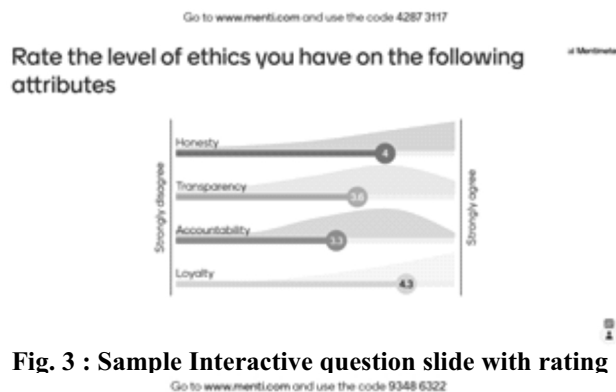

Fig. 1 : Sample Interactive question slide using Pear Deck add-on

Fig. 2 : Sample Interactive student response slide using Pear Deck add-on

comparing with Pear Deck is that we need to break out of the presentation to use this. But one extra feature we have here is the presence of word cloud formation. Few sample Mentimeter poll images used for this course are given below in Fig. 3 and Fig. 4.


Fig. 3 : Sample Interactive question slide with rating

Fig. 4 : Sample Interactive question slide with word cloud answer option using Mentimeter tool.

Puzzle.org

Crossword puzzles help tutors to evaluate the learning level of their students, especially in a theory course (Zamani et al., 2021). It also makes them curious while solving the puzzle, which makes this evaluation a fun based activity. In virtual class, we can use 'puzzle.org' - an online crossword puzzle maker to create your crossword puzzle. This tool gives an excellent appearance and simple organization. Some of the sample crossword puzzle used for this course is provided below in Fig. 5.
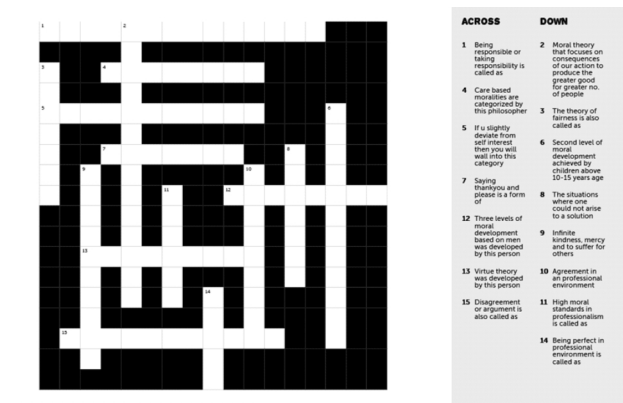
Fig. 5 : Sample crossword puzzle prepared for Module 2 via puzzle.org tool.

Wheel of Names

Randomly picking a student to respond during the online class becomes tricky, as it may feel biased sometimes for the students (Vargas Luna, 2018). So to avoid this, we can make use of this spin wheel link https://wheelofnames.com/. In this, we can save our students list, and during the time of conducting activities or Q&A sessions, we can use this to pick students from the class. It rules out bias and also makes it fun for the students to participate in classroom activities. The sample image of the tool is given below in Fig. 6.

Fig. 6 : Homepage of wheelofnames.com tool to create spin wheel with student names

Table 3 : Online Game Activities

Mod ule No.	Topic from the syllabus	Online game links
1	Stakeholder Management	http://bioteamsapps.com/netsim/netsims/ken.thompson/scg_demo/index.html
1	Supply Chain Management	https://forio.com/app/showcase/near-beer-game/ https://beergame.masystem.se/game/-MSa0k2rvv-LXSrSsbrL
2	Moral Dilemma	https://www.moralmachine.net/
3	Discrimination	http://playfairplay.org/
3	Loyalty	https://www.mission-us.org/games/prisoner-in-my-homeland/
4	Making leadership	https://www.mission-us.org/games/a-cheyenne-odyssey/
4	Moral Imagination	https://www.mission-us.org/games/city-of-immigrants/
5	Environmental ethics and Moral leadership	https://www.quandarygame.org/

B. Planning of Game based Sessions

The virtual activities planned with its corresponding topics and tool is provided in the below Table 3.

Online Games

Playing games is an easy way to grab students' attention. Gamification has proved to be effective in creating an interactive learning environment. The students learn and understand the concepts conveniently by this gamification (Zainuddin et al., 2020). Pinterest and multiple resources sharing websites are available to track and find the best online game matching your topics. But a prior preparation is needed to implement this in the classroom to get better effect.
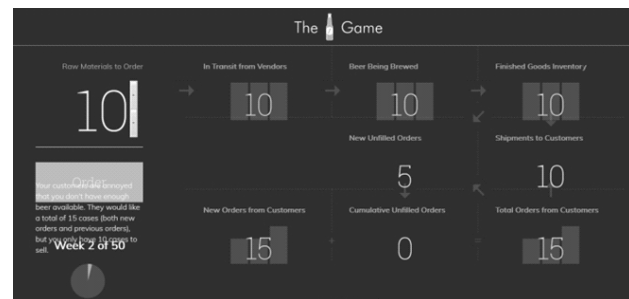
Fig. 7 : Sample clip from the online game - 'The Beer Game' used for the topic 'Supply Chain Management'
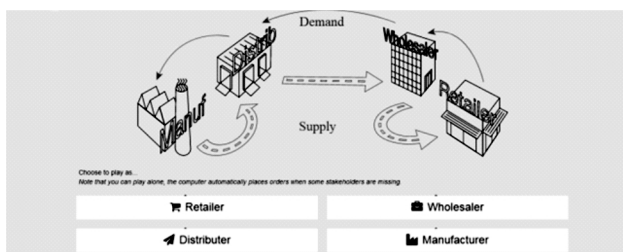
**Fig. 8 : Sample clip from the online game -
'MA systems Beer Game' used for the topic
'Supply Chain Management'**

**Fig. 9 : Sample clip from the online game -
'Fair Play' used for the topic 'Discrimination'**

C. Teaching Methodology

When we plan to implement the virtual activities and gamification then the teaching and learning methodology also must change. The contents and slides have to be prepared accordingly. The online class should be pre-planned very well based on the activity/game:

1) Activity sessions: To conduct the activities, we need to keep the required tabs open before initiating the session to avoid any issues. Plan your narration for handling the activities. Make your students first understand the objectives behind the exercises. If it's an individual activity, then select students using the spin wheel to participate in that. At the end of each exercise, explain the takeaway points correlating with the topic.

2) Gamification: Online games and simulations have to be evaluated by you once before trying it outlive. The best practice is to play the game by yourself once and plan accordingly for the live session. Explain the concepts related to your topic in between the games and proceed further. You can

share the link with your students and ask them to play and can ask them to share the screenshots.

4. Students reflection on this course

A survey on the impact of activity and gamification methods in the teaching-learning process was collected from all 36 students. The survey consisted of a total of 5 questions, as mentioned below, and its corresponding responses are also given:

Q1. Which of the following online tool was most helpful and effective in creating an interactive learning atmosphere for this course? (Check all that apply).

The responses from the participants for this survey question Q1 is depicted as a Bar graph as shown in Fig. 10.
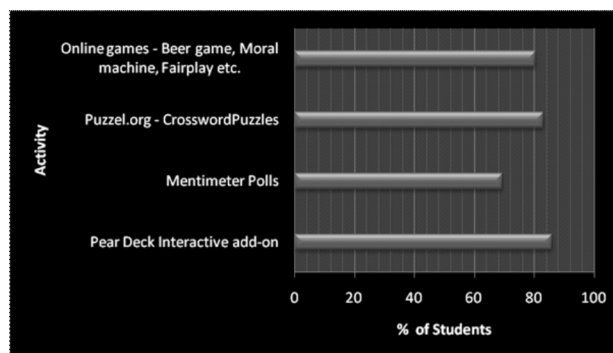
**Fig. 10 : Response of participants for
Survey Question #Q1 on activity tools**

From Fig 10, it was evident that around 86 percent of students felt that Pear Deck was the most helpful and effective tool to create an interactive learning atmosphere for this course. We can also get to know that around 80 percent of the students mentioned that the online games were also equally effective. Also,
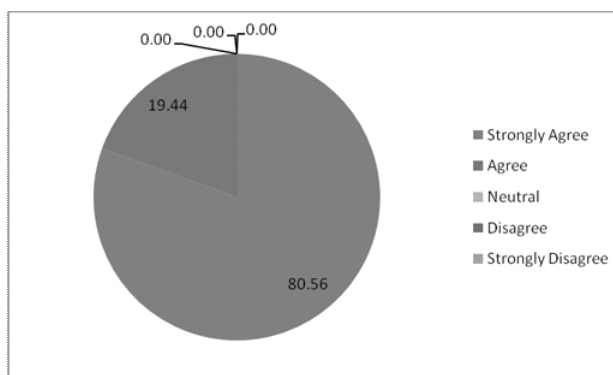
**Fig. 11 : Response of participants
for Survey Question #Q2 on learning objectives**

around 83 percent of students felt that crossword puzzles were also helpful for interactive learning. The Mentimeter polls have been mentioned by around 70 percent of the students.

Q2. The activity and gamification methods helped in achieving the course learning objectives at the end of this course. The response from the participants for this survey question number Q2 is depicted in Fig. 11.
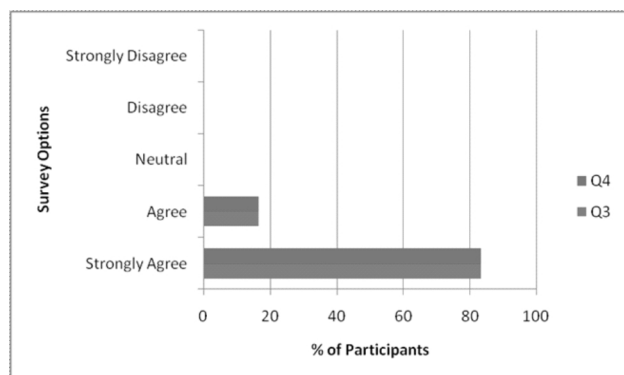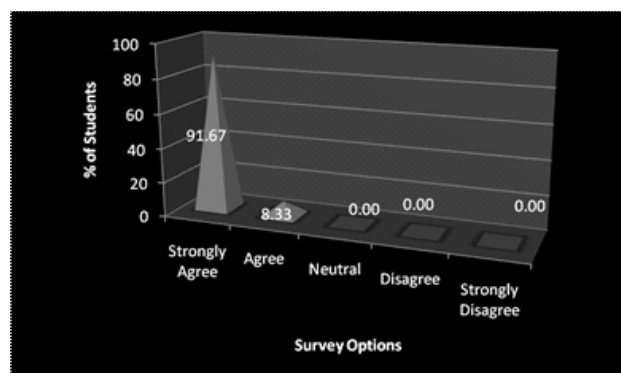

Fig. 12 : Response of participants for Survey Question Q#3 and #Q4 on blended learning on interactive learning and interest in course

From Fig.11, we can know that about 81% of the students have strongly agreed and the remaining 20% has agreed that the activity and gamification methods adapted in this course helped them in achieving the course learning objectives at the end of this course.

Q3. The combination of regular lecturing with activity and game based teaching – learning method helped to create an interactive learning atmosphere.

Q4. The use of activity and game based teaching – learning method helped to create an interest towards this course. The responses from the participants for

Fig. 13 : Response of participants for Survey Question #Q5 on recommendation of course for future learners

this survey question number Q3 and Q4 are depicted in Fig 12.

About 92% of the participants strongly agreed and 8% agreed and which implies that all the students recommend this course for future learners.

5. Conclusions

Participants of the course 'Professional Ethics' under this activity and game-based learning method have mentioned through survey a significant achievement in their learning objectives and experienced effective classroom interactions. This methodology inculcates interest in the learners towards the course and makes it simple to grasp the concepts. There is a lot more preparation when one wants to incorporate virtual activities in lessons when compared to the traditional lecture or tutorial sessions. The faculties and institutions offering similar courses could try such approaches to enhance their teaching-learning process, especially for virtual classes. It is a small-scale study with only 36 students from one sample site. It will be best not to claim that the findings can be generalized to other courses/countries due to the size of the samples. The teaching methodology incorporated in this study was planned for a virtual environment. Thus for offline mode, we need to plan accordingly.

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