

Traditional Learning Versus Simulation Based Learning: A Comparative Analyses of Satisfaction Level of Students

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Abstract

Traditional learning incorporates physical presence of students and educators while promoting discipline, peer interaction, and hands-on activities. On the other hand, simulation based learning methods are more interactive educational approach that uses simulations to mimic real-world scenarios.. Traditional learning methods are seen to be more learning and educative. On the other hand, simulation-based learning is more interactive and engaging for students. Thus, it is imperative to asses the satisfaction levels of students with the two learning methods. This will facilitate the policy makers to understand the long-term impacts of these learning methods and their affects the performance of the students.

For the present research, bachelors and masters students from educational institutions (colleges, universities) of Bhubaneswar, Cuttack, and Dhenkanal, Odisha have been taken to be the population for sample collection. Survey strategy has been used to collect the quantitative data for this study. Both the questionnaires traditional learning and simulation based learning were randomly distributed amongst the selected sample. Descriptive analysis has been conducted where Paired Samples t-test has been used to compare traditional learning and simulation learning practices. SPSS 26.0 has been used to conduct analysis.

The research found a significant difference has been observed between traditional and simulation learning. Students showed higher satisfaction with simulation-based learning. However, in terms of self-confidence, collaboration, active learning practices, students favour traditional learning more. Based on the findings of the research, stakeholders can accordingly proceed with decision making and incorporate a mixed methodology incorporating both traditional and simulation based learning method in the curriculums.

Keywords: Traditional learning, simulation based learning, learning methods, technology

Introduction

Traditional learning is the oldest form of conventional method of learning. Herein, education is imparted in a structured, physical classroom setting. Traditional learning incorporates physical presence of students and educators while promoting discipline, peer interaction, and hands-on activities. This helps the students in clarifying their doubts in a better way and the teachers are also able to assess the learning status. (Lampropoulos, G. Sidiropoulos, 2024). Thus, traditional learning is based on instructor-led learning focused on fixed curriculum in a

classroom environment where in students are expected to adhere to a fixed schedule, location, and pace of learning.

With the emerging world of advancements in technology, simulation-based learning methods have been introduced. It is an interactive educational approach that uses simulations to mimic real-world scenarios. Simulation-based learning is more interactive and fun. It allows students to practice skills, make decisions, and gain experience in a simulated environment. Owing to its interactive nature, students experience high levels of satisfaction. Simulation-based learning uses AI technology to imitate real-life processes and allows learners to test their hypotheses in real-life environment with human-like interactions (Dai & Ke, 2022). It often utilizes virtual reality, augmented reality, artificial intelligence, or computer-based models to enhance interactivity there by increasing its effectiveness on the learners.

Traditional learning methods are seen to be more learning and educative. On the other hand, simulation-based learning is more interactive and engaging for students (Allcoat et al., 2021). Thus, it is imperative to assess the satisfaction levels of students with the two learning methods. This will facilitate the policy makers to understand the long-term impacts of these learning methods and their affects the performance of the students.

Review of Literature

Like traditional learning, simulation-based learning is spreading in every field of education. Almost all the domains have encapsulated simulation-based learning to simplify the learning experiences of the students. Simulation-based learning is also used in radiography education. The most beneficial aspect of simulations in radiography is that the students get to practice complex procedures in a safe environment without harming cadavers. Various medical fields and surgical training programs use cadavers for doctors to practice operations and understand the in and out of human body. Simulations have made this process easier as virtual reality is capable of generating a 3D view of the human body. This provides a detailed view of the human body with every minute detail of the organs that the doctors need to study and practice. The simulations have therefore, made the learning experience quite interactive and easy without harming anyone in the process (O'Connor et al., 2021). Other than surgical training, simulations are also beneficial in nursing education. It has significant positive effects on the cognitive, affective, and psychomotor domains of learning. Simulations mimic the reality of clinical environment that promotes the students to practice and accumulate their experiences. Both positive and negative effects of simulations were identified among the

nurses. The research observed significant improvements in knowledge acquisition, psychomotor development, learning satisfaction, self-efficacy, critical thinking ability, confidence, learning motivation, communication skills, and clinical competence. On the negative side, multiple exposures to simulations is driving people away from the reality. Nurses are observed to take simulations as games since no real lives are harmed and are forgetting the real complexity of their job (Hung et al., 2021).

With the technological advancements emerging in Covid times, online or simulation-based learning gained popularity since Gen Z's are all about technology and going digital with everything. Therefore, simulations for learning have been widely popular among the students. Most students prefer to use their smartphones, tablets, laptops, and desktops for learning. From pedagogical perspective, they are able to learn all the concepts that they would learn from books in a classroom setup. Rather they are learning it using virtual reality which gives them almost real-life experience virtually. This educational method is boosting student's motivation for learning and improving their learning outcomes. It is observed that learners are willing to indulge into learning activities themselves without their parents forcing them to sit and study all the time (Krouska et al., 2022). Simulation-based learning tends to engage the students more since it is an interactive and fun way to learn even complex topics. Many students stated that the subjects that they were most afraid to learn have become easy and understandable to them through simulations. Students who are learning foreign languages are finding it easy to learn through simulations since they get multiple runs to listen to the concepts and practice them with bots which increases their interactivity. Student's interaction has slightly reduced than traditional learning approach but their cognitive and social skills have improved. Simulations are also associated with mindset improvement and growth. Significant improvements in the critical thinking and problem-solving abilities are also visible in students (Adipat et al., 2021). Science laboratories used to threaten students from performing any experiments. Many complex experiments are supposed to be performed by teachers and lab experts and the students are allowed to observe only. As a matter of fact, not much can be learned by simply observing. Simulations have made it easy and non-risky for students to perform all kinds of experiments online using simulators. The experiments that go wrong will demonstrate what went wrong and the step that was wrongly performed by students. With this technology, the students are also able to see the repercussions of their mistake with the concept and learn from their mistakes. Traditional learning approach where

students observe the complex experiments do not teach anything to the students and they practically forget what they saw (Almasri, 2022).

Thus, both traditional and simulation-based learning have some positive and negative effects on students. However, simulation-based learning is providing more ease, interactive experience, engagement, and motivation to students thereby increasing their satisfaction with this learning approach.

Material and Methods

Bachelors and Masters Students from educational institutions (colleges, universities) of Bhubaneswar, Cuttack and Dhenkanal, Odisha have been taken to be the population for sample collection. The eligible respondents have been divided into two groups. These students have been exposed to both traditional learning and simulation learning methods. The sample size of the present research is 526. Among these 263 respondents were each for traditional learning and simulation learning respectively. Out of these 263 respondents from traditional learning, 28.3% population are males and 70.9% are females. The most number of respondents (127) belong to the age group of 20 to 22 years who are opting for traditional learning methods. Also, 76.2% of the respondents are Post Graduation students. For simulation learning group, male respondents is slightly more than traditional method that is 31.3% while 67.9% females are using simulation learning. Most number of respondents that is 127 respondents belongs to the age group of 20 to 22 years and are pursuing Post Graduation.

The questionnaire for both traditional and simulation learning has been adopted from (Unvera et al., 2017). Survey strategy has been used to collect the quantitative data for this study. Both the questionnaires were randomly distributed amongst the selected sample. Descriptive analysis has been conducted where Paired Samples t-test has been used to compare traditional learning and simulation learning practices. SPSS 26.0 has been used to conduct analysis

Result and Discussion

To conduct a comparative analysis between traditional learning and simulation learning, following paired samples t-test has been conducted.

Hypothesis for t-test:

H₀₁- There is no significant difference between traditional learning and simulation learning

H_{a1}- There is a significant difference between traditional learning and simulation learning

The six practices of traditional and simulation learning which have been considered in the present research are Satisfaction, Self-Confidence, Active Learning, Collaboration, Diverse ways of Learning, and High Expectations. The paired samples t-test has been conducted on these practices to compare student’s perception on traditional and simulation learning.

Table 1: Paired Samples Test

		Mean	Std. Deviation	Std. Error Mean	Sig.
Pair 1	Satisfaction TL	1.8700*	.62783	.03871	0.000
	Satisfaction SL	1.6844*	.57028	.03516	
Pair 2	Self-Confidence TL	1.7072*	.60014	.03701	0.000
	Self-Confidence SL	1.9686*	.59335	.03659	
Pair 3	Active Learning TL	1.7167*	.65419	.04034	0.000
	Active Learning SL	2.0395*	.58983	.03637	
Pair 4	Collaboration TL	1.6407*	.89910	.05544	0.000
	Collaboration SL	2.0837*	.73531	.04534	
Pair 5	Diverse ways of Learning in TL	1.9886*	.72829	.04491	0.000
	Diverse ways of Learning in SL	1.6958*	.78552	.04844	
Pair 6	High Expectations TL	1.9658*	.84527	.05212	0.000
	High Expectations SL	1.7586*	.88114	.05433	

*1= Strong Agreement, 2= Agreement, 3=Neutral, 4=Disagreement, 5= Strong Disagreement

It can be inferred from Table 1 that significant difference exists in all the factors of traditional and simulation learning since p-value is 0.000 (<0.05). Thus, alternate hypothesis (H_{a1}) is accepted while null hypothesis (H₀₁) has been rejected. It can be stated that there is a significant difference between traditional learning and simulated learning.

The mean values of all the factors are showing significant difference. When analysed on for “Satisfaction” of students for traditional and simulation learning, the mean values observed are 1.87 and 1.68 respectively. This shows that students have presented satisfaction with both the learning methods. However, students are more satisfied with simulation-based learning.

When analysed for “self-confidence” that students gain from these learning methods, the mean values observed are 1.71 and 1.97 for traditional and simulation methods respectively. This showed that students gain more self-confidence on their learning and knowledge via traditional classroom learning when compared to simulation-based learning.

For “active learning” practice, students again favoured traditional learning (1.72) over simulation learning (mean value=2.04). This shows students prefer traditional learning when it comes to being active towards learning practices.

Students were also asked to rate traditional and simulation learning on the parameter of collaboration. With a mean value of 1.64 for traditional learning, students stated that they get a better collaboration experience in traditional learning environment where both teachers and students meet physically and collaborate on the learning practices.

Contrarily, students have favoured simulation learning methods on the parameters of “diverse ways of learning” and “high expectations”. This could be because simulation-based learning methods provide diverse ways of learning every concept and thus attracts the students more towards learning even the hard topics. Therefore, it is observed that students have a higher expectation from simulation learning methods in the future.

Discussion and Conclusion

The research conducted a comparative analysis between traditional learning and simulation learning. Hypothesis testing has been performed and a significant difference has been observed between traditional and simulation learning. Students showed higher satisfaction with simulation-based learning. Simulation-based learning is also more preferable due to the diverse ways of learning like instead of just reading or listening to lectures, students actively engage in realistic scenarios. When compared with traditional learning methods like lectures, simulation methods are very interactive thereby making the students engaged and attentive. For example, gamification method of simulation based learning makes learning very enjoyable. Thus, students also have high satisfaction with simulation learning. However, for all the other parameters considered in this research like self-confidence, active learning, and

collaboration; students favoured traditional learning methods. The research conducted by Singh et al., (2020) stated that simulation-based learning is definitely not a replacement for traditional learning. There are several reasons behind this. The first and foremost important reason is the availability of traditional learning methods. Schools and institutions using traditional methods are readily available across the globe. However, with simulation learning, students need specific infrastructure and tools to be able to access simulations based techniques. Owing to these reasons, simulation based methods are not very prevalent.

As per the research by Prabhakar, (2023), traditional learning methods bring discipline into the lives of students and promote a healthier lifestyle. It is also preferable due to increased collaboration among the students and teachers. Students have also found it easier to resolve their doubts and queries with teachers in a classroom setup. This method helps students to get some time away from the screen and be with the real world. Personal interaction with teachers also promotes good behavior in students and improves their mannerisms.

As a matter of fact, both learning methods have their own pros and cons. Even though traditional method is widely acceptable and easily available, the positives of simulation learning methods like remote and scalable learning, improved engagement and motivation for students and inculcating decision making skills like problem-solving abilities and critical thinking cannot be ignored. Thus, simulation-based learning can be used complementarily with traditional learning methods. This amalgamation will use the best of both while ignore the cons of each method.

The conclusion drawn from the research showed that students are more satisfied with simulation-based learning since it makes learning interactive, allow students to make mistakes without real-world consequences while imparting skills of handling emergencies or critical operations before facing them in real life. However, in terms of self-confidence, collaboration, active learning practices, students favour traditional learning more since they get to have personal interaction with the teachers and peer students. This gives them a positive learning experience and maintains a healthy and disciplinary lifestyle in student's life. But, students still have higher satisfaction with simulation learning. Thus, it is expected that in the future it will become a more readily available and preferable medium of learning. This research presents an overview to the policy-makers on student's perception of both learning methods. The stakeholders can accordingly proceed with decision making and

incorporate a mixed methodology incorporating both traditional and simulation based learning method in the curriculums.

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