A Study of Student Satisfaction and Student Engagement in Massive Open Online Courses

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In the partial fulfillment of the requirements for the degree of

MASTER OF PHILOSOPHY IN EDUCATION

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CERTIFICATE OF DECLARATION

This is to certify that the material embodied in the present work entitled ***"A Study of Student Satisfaction and Student Engagement in Massive Open Online Courses"*** is based on original M.Phil. research work. It has not been submitted in part or full for any other diploma or degree of any University/Institution deemed to be University and College/Institution of National Importance. References from other works have duly cited at the relevant places.

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CERTIFICATE OF ORIGINALITY

The research work embodied in this dissertation entitled ***"A Study of Student Satisfaction and Student Engagement in Massive Open Online Courses"*** has been carried out by me from School of Education, Central University of Haryana, Mahendragarh, Haryana, India. The manuscript has checked for plagiarism verification by Turnitin software under submission ID No. 1740984659 vide Plagiarism Analysis Report No: CUH/2022/CENLIB/P07 Dated: 13/01/2022 I declare that the research work and languages included in this dissertation are free from any kind of plagiarism.

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ABSTRACT

The teaching-learning process has undergone tremendous shifts in the 21st century. There is also a paradigm shift in the education system during the pandemic COVID-19. Several innovations have taken place towards making education student-centric. Presently, the learning system moves beyond the recall of various facts and focuses on developing 21st century skills such as problem-solving and creativity by providing opportunities for deeper engagement and satisfaction in the process of learning. Massive Open Online courses provide enormous opportunities for millions of learners to participate in free higher education courses via online mode. The present study aims to find out student satisfaction and student engagement in massive open online courses concerning their demographic variables and find out the validity and reliability of both the student satisfaction and engagement scales. The researcher used a self-prepared questionnaire entitled "Student satisfaction in MOOCs" to measure student satisfaction in higher education and adopt a "MOOC engagement scale" tool. The demographic variables adopted in the study are gender and educational background of the students who have completed at least one MOOC. The target population constitutes all higher education students studying in MOOCs all over India. A sample of 240 students was chosen by using convenient sampling. The findings reveal no substantial difference in student satisfaction or involvement in MOOCs between male and female students. On the other hand, there is no discernible difference in student satisfaction and engagement based on educational background also. There is a strong relation between student satisfaction and student engagement. According to the findings, MOOCs give students equal chances irrespective of their gender and educational background, and they are equally engaged and satisfied with the quality of the courses available.

शोधसंक्षिप्तिका-

21वीं सदी में शिक्षण अधिगम प्रक्रिया में जबरदस्त बदलाव आया है। महामारी-COVID-19 के दौरान शिक्षा प्रणाली में भी बदलाव आया है। शिक्षा को छात्रकेंद्रित बनाने की दिशा में कई नवाचार हुए हैं। वर्तमान में- सीखने की प्रणाली विभिन्न तथ्यों की याद से आगे बढ़ती है और सीखने की प्रक्रिया में गहन जुड़ाव और संतुष्टि के अवसर प्रदान करके समस्या समाधान और रचनात्मकता जैसे-21 वीं सदी के कौशल विकसित करने पर ध्यान केंद्रित करती है। बड़े पैमाने पर खुले ऑनलाइन पाठ्यक्रम लाखों शिक्षार्थियों को ऑनलाइन मोड के माध्यम से मुफ्त उच्च शिक्षा पाठ्यक्रमों में भाग लेने के अपार अवसर प्रदान करते हैं। वर्तमान अध्ययन का उद्देश्य उनके जनसांख्यिकीय चर से संबंधित बड़े पैमाने पर खुले ऑनलाइन पाठ्यक्रमों में छात्र संतुष्टि और छात्र जुड़ाव का पता लगाना है और छात्र संतुष्टि और उनकी सहभागिता दोनों की वैधता और विश्वसनीयता का पता लगाना है। शोधकर्ता ने उच्च शिक्षा में छात्रों की संतुष्टि को मापने और एमओओसी(MOOC) एंगेजमेंट स्केल टूल को अपनाने के लिए एमओओसी में छात्र संतुष्टि नामक एक स्वतैयार प्रश्नावली का उपयोग किया। अध्ययन में - अपनाए गए जनसांख्यिकीय चर उन छात्रों के लिंग और शैक्षिक पृष्ठभूमि हैं । लक्षित जनसंख्या पूरे भारत में छात्रों एमओओसी में पढ़ने वाले सभी उच्च शिक्षाजिन्होंने कम से कम एक एमओओसी पूरा कर लिया है का गठन करती है। सुविधाजनक न्यादर्शन का प्रयोग कर 240 विद्यार्थियों का एक प्रतिदर्श चुना गया। परिणाम दर्शाता है कि एमओओसी(MOOC) में छात्र संतुष्टि और जुड़ाव दोनों में पुरुष और महिला छात्रों के बीच कोई महत्वपूर्ण अंतर नहीं है। दूसरी ओर, छात्रों की शैक्षिक पृष्ठभूमि में छात्र संतुष्टि और जुड़ाव दोनों में कोई महत्वपूर्ण अंतर नहीं है। छात्र संतुष्टि और छात्र जुड़ाव के बीच एक महत्वपूर्ण संबंध है। वर्तमान अध्ययन इंगित करता है कि छात्रों को एमओओसी से समान अवसर मिल रहे हैं और वे एमओओसी में प्रदान किए गए पाठ्यक्रमों की गुणवत्ता से समान रूप से जुड़े हुए हैं और संतुष्ट हैं।

CHAPTER 1
INTRODUCTION

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INTRODUCTION

1.1 Introduction

The era of twenty-first century is known as the century of science and technology. In the age of modernization, learners are deeply involved with various technologies. MOOCs, which stand for Massive Open Online Courses, are immensely changing how students learn more about it on the internet viz., online (education-blog). Under the mission of digital India, the government has taken several initiatives, and one of the most challenging and focus area is Massive Online Open Courses (MOOCs). The Indian government has launched a major initiative named SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) (MHRD Guidelines for MOOCs), to provide an integrated platform and gateway (portal) for online courses that cover all higher education, secondary school, and skill sector courses (Mondal & Majumdar, 2019). SWAYAM is an Indian-developed IT platform for hosting Massive Open Online Courses (MOOCs) (Majumdar, 2021).

Satisfaction is based on fulfilling one's requirements and anticipation (Shiv & Huber, 2000). It is the judgment of a pleasurable level of consumption that is connected to the total fulfilment of a person's life. It is broadly accepted as a desirable outcome of different experiences of products and services (Hossain, 2018). It can be measured by the views of the pleasurable fulfilment of one's wants and needs (Ali et al., 2016). Satisfaction is a state which is usually felt by a person who has already experienced performance (Weerasinghe, 2017) or an outcome that fulfils one's expectation and

service quality (Santiuste et. al, 2015). It is also an essential parameter of the educational field of excellence.

Student engagement is defined from the perspective of persistence, self-direction, sustained inquiry, playfulness with content, and unprompted transfer of understanding (Heick, n.d.). The students' engagement generally talks about what a student brings in the field of higher education in terms of certain goals, beliefs, aspirations, and values and how these are shaped and mediated by the experience of the whilst a student. Students' participation is generated, co-produced, and recreated via the lenses of their overall identities and views, as well as the meaning and sense they make of their experiences and interactions.

1.2 Massive Open Online Courses (MOOCs)

MOOCs have brought a big wave of scope to the door of constructive education (Kanjilal & Kaul, 2016). A MOOC is an online course that enables many students to study at their speed (education-blog). Peer feedback and open-source materials play an essential role in students' interactions (Samanta, 2018). MOOCs are learner-centred because they allow any number of students to study simultaneously. These classes are open to anybody from anywhere. MOOCs have grown in popularity as a tool for individuals of all ages to enhance their skills and knowledge. MOOC professors employ technology to imitate their teaching methods in the classroom (mooc.org).

MOOCs provide opportunities to their learners such as video lectures, sharing notes, downloading notes, contributing their own, and sharing their point of view by communicating with peers and getting certificates. The OER (open educational resources) movement, spurred by the MIT open courseware initiative, gave birth to the

first MOOC. However, in the case of OER, we are unable to resolve our concerns about specific themes. We may simply resolve our doubts through MOOCs (Venkatesh, 2014).

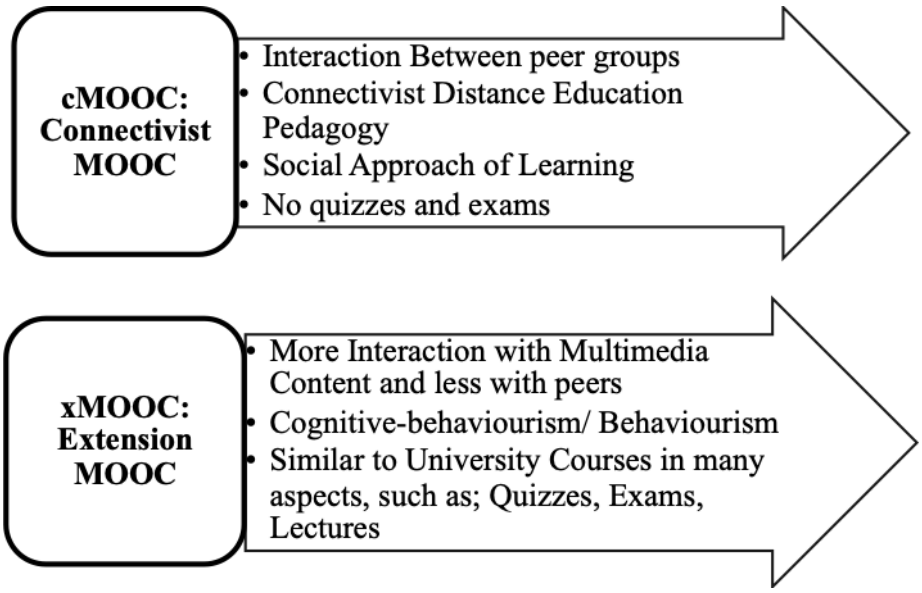
Therefore, MOOCs fulfil both sides. Various MOOCs platforms provide open educational courses, such as Coursera, Canvas, SWAYAM, edX, UDACITY, Khan Academy, and Future Learn. Anyone can enrol in the course of his choice without any qualification restrictions. Online courses comprise videos, handouts, suggested readings, and online tests. On successful completion of the course, certificates are also issued.

MOOCs are online courses that are asynchronous, open-access, and meant to register hundreds or thousands of students simultaneously (Kurt, 2021). MOOCs provide a wide range of content forms, such as recorded video lectures, online examinations, and online readings, as well as varying degrees of student-instructor and student-student interaction (Kurt, 2021). Because of their nature, MOOCs may be able to accommodate students with similar interests from various backgrounds, experiences, and locations throughout the world (Kurt, 2021).

1.2.1 Types of MOOCs

MOOCs are divided into two categories: xMOOCs and cMOOCs. Both MOOCs use different pedagogies. Such as:

Figure 1.1. Types of MOOCs



xMOOCs: These MOOCs are based on a behaviourist approach, which is allegedly dominated by "drill and grill" techniques of training (Alkhuzaimi, n.d.). According to the behaviourism theory of learning, all behaviours are learned by conditioning, such as video presentations, brief quizzes, and testing. It is based on standard course frameworks and employs well-known teaching methods and resources. Students will watch pre-recorded lectures, complete assigned readings, and engage in discussions guided by the course instructor or the instructional staff of a higher education institution. xMOOCs are typically self-contained, with materials from outside the primary content distribution and learning platform being utilised only in rare cases (Kurt, 2021). Courses have a specific goal of finishing and earning certain knowledge certification of the subject area. However, some services need paying memberships to get graded materials and certifications. They include components of the original MOOC but are, in essence, branded IT platforms that provide universities with content distribution relationships (Levy, 2014). The teacher is the authoritative source of

information, and student interactions are confined mainly to asking for help and offering advice on difficult topics.

cMOOCs: These are based on connectivist pedagogy principles, which state that content should be aggregated rather than remixable, pre-selected, repurposable, and fed forward, i.e., developing resources should be oriented towards future learning (Anderson et al., 2010). In cMOOC instructional design techniques, learners are linked together to answer questions or cooperate on collaborative projects. This may involve promoting the MOOC's collaborative development. Students in a cMOOC will collaborate to find, assess, and add course content by utilising the learning platform to submit resources such as tweets, blog entries, and wikis (Aragon & Johnson, 2008). By finishing, collecting, and evaluating the students' contributions to the course, a cMOOC teacher or instructional team fosters learning (Kurt, 2021).

Even while other asynchronous online courses have been available for decades, MOOCs are among the most recent evolutions in online learning due to its asynchronous nature, global reach, relationship to college credit, and fully-online design and delivery (Kurt, 2021). Because of its rapid and ongoing popularity among current and lifelong learners, MOOCs seem to be signalling many important trends that will continue for the foreseeable future (Kurt, 2021).

As educational technologies, instructional design, online learning, content delivery platforms continue to evolve, more learners with more needs, and motives will be drawn to taking online courses (Muthuprasad et al., 2021); a growing demand that will spur further improvements in technology and delivery. Rather than relying just on content delivery, it seems that future online learning options will need to focus on using

technology to enable customised learning experiences that meet a variety of student needs, including accreditation, affordability, and accessibility, among others (Kurt, 2021; Patrinos & Shmis, 2020).

1.2.2 Four Quadrant Approaches in MOOCs

There are four quadrants in MOOCs: e-tutorial, e-content, discussion forum, and assessment.

E-tutorial: An online tutorial is a self-study activity that aims to meet the course's learning objectives (Design principles for online tutorials, 2016). They are frequently offered through the internet in the form of recorded tutorials, which consist of video or screenshots of a topic expert delivering information and concepts or doing demonstrations. Interactive tutorials, which are an organised collection of navigable web pages, are another instructional. Text, picture, audio, video, self-test questions, and other interactive activities may be found on a single page. E-tutorials often contain structured video and audio material, simulations, animation, virtual labs, video demonstrations, and video transcription, as well as other multimedia elements (CEC on MOOCs, 2021). As a result, students' study, amass a wealth of information and take an active role in class. In addition, instructors frequently create and teach unique courses to achieve certain learning objectives.

E-content: In MOOCs, e-content is very important in online learning. A wide range of digital assets with instructional value is offered in the online mode. Teachers and students may use, reuse, and modify some high-quality materials provided for free or with little limitations for their learning and teaching (The emergence of open educational resources, n.d.). Students are transitioning from textbooks to digital course

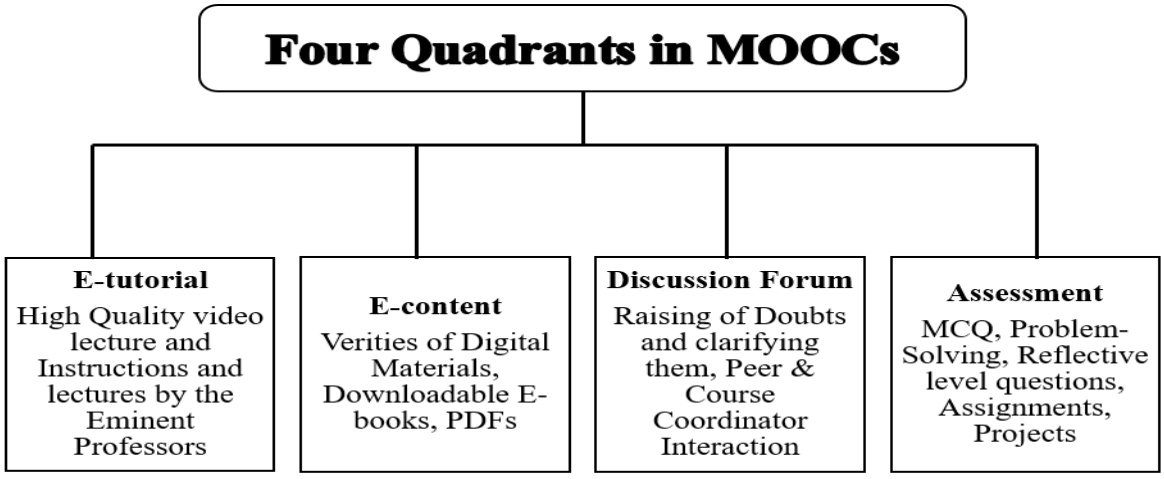
materials due to the high expense of textbooks. These products increase interaction and social participation for both students and instructors. Because of the flexibility in time, location, and learning speed, it is gaining popularity. It encompasses all types of material produced and disseminated through different forms of electronic media. It can be utilised by a broad range of learners with a wide range of requirements, backgrounds, prior experience, and ability levels. It can be simply and quickly shared and transferred to an endless number of individuals throughout the globe. The usage of well-designed and created e-content benefits students, instructors, and others (Malik, 2015).

Discussion Forum: A discussion forum is usually utilised by the course organiser or his team to raise questions and explain them in near real-time (CEC on MOOCs, 2021). Student satisfaction is affected by the academic assistance offered in the course, which is based on communication between learners and mentors (Kakada et al., 2019). Students may utilise the online discussion forum for many purposes, including reading materials before an assignment or exam, engaging students in a discussion of course materials before class, and commenting on topics read or accomplished outside of class (Conventry University, News, 2021). This forum has the potential to help students succeed in online learning. Students often ask questions regarding the course materials, express their thoughts on many issues, and ask questions on the forum. The communication environment is based on e-learning feedback and answers through email and telephone.

Assessment: Assessment, the fourth quadrant in MOOCs, is a vital component of online learning and plays a major part in the learning process. It gives students a notion of how far they have progressed in a course, identifies individual strengths and

weaknesses, and (Wiley, 2020) eventually determines if students have met the course's learning goals. Assessments must also engage students and provide them with the skills they will need in future courses, practicums, and possibly employment ("Authentic evaluation" 2020). Questions and answers are generally presented in the form of multiple-choice questions, fill-in the blanks, matching questions, short answer and long answer questions, quizzes, assignments and solutions, discussion forum topics, FAQs and the process of creating the questions and answers (Projects CEC on MOOCs; Kamarudin et al., 2020).

Figure 1.2 Four Quadrant approaches in MOOCs



A MOOC may be taken by anybody interested in the topic and has access to the course, regardless of age, background, or location. MOOCs are often provided twice or three times a year to ensure that students do not miss out. MOOCs, which are led by subject matter experts and assisted by teaching assistants, provide students with high-quality instructional resources. A MOOC generally involves 1-2 hours of study each week for 5 weeks, allowing students with hectic schedules to learn (Kurt, 2021). In a MOOC,

students may go through course materials and assessments at their leisure while also engaging in a global learning community (Kurt, 2021).

MOOCs (Massive Open Online Courses) are online learning environments that allow students to take courses in various areas for free or at a low cost. MOOCs are a kind of educational technique that enables hundreds of thousands of students to attend online courses for free worldwide. MOOCs are free online classes that need just that you have access to the internet. Consequently, MOOCs are open to everybody and do not have a limit on the number of people who may participate (Kurt, 2021). MOOCs enable users to enrol in various courses for a variety of reasons, including personal curiosity, job progress, and social networking. Similarly, MOOCs vary in their intended purpose in terms of how designers construct their MOOCs to meet the needs of prospective students, especially when it comes to addressing intrinsic goals like general curiosity or extrinsic goals like professional development (Kurt, 2021).

It offers a flexible schedule and provides education free of cost, but learners have to pay a nominal charge for certificates on some MOOCs platforms. So, it basically focuses on access, equity, and quality. Thus, we can say that the learning in MOOCs should be very satisfying, which depends on the design of the course (Fournier & Kop, 2015). The design must be instructional and the cognitive and sometimes constructive instructional design are used by MOOC platforms accordingly. During pandemic COVID-19, open educational resources for online learning (NEP, 2020) has upgraded much. Governments in most developed and developing countries have consequently recommended moving teaching-learning through online mode.

Now, the Government of India has decided that they will provide education through blended mode. That is like 60% of their total courses will be provided through offline mode and 40% of their total courses will be provided through online mode. UGC has also announced that they will provide 83 undergraduate and 40 post-graduate non-engineering courses through the online mode (India Today, 22nd May). The UGC has also announced new MOOCs for its SWAYAM platform for July session 2021 and this report was published on 28th May, 2021. UGC has also declared the disciplines, degree programmes, subjects, course titles, name of the course coordinators with their designations, affiliated institutions, starting dates as well as ending dates, name of the host universities, tentative exam dates with no. of credit of the courses and the URL of the courses. It can be said that the proper engagement comes from various ways (Fredricks et al.,2004). So, it's needless to say that they are providing learner, learning support, managing assessment, and feedback as well as a certificate of completion will be awarded to those who complete all the tasks in the course and provide the certificate of participation on the marks and assessments.

1.3 MOOCs from the Perspective of NEP-2020 and Indian Initiative

The National Education Policy (NEP) permits students to take a major part of their course through online platforms. This includes the Government's NEP 2020 MOOC platforms like the SWAYAM portal. Online platforms are now considered one of the major parts of digital education. During the pandemic COVID-19, the MOOCs gained much more relevance. The SWAYAM platform has partnered with more than 203 institutes and has around 1,24,41,000students enrolled. However, 900000 have registered for the exams, but only 6,54,664 have passed successfully. The UGC has

declared guidelines to all the universities to offer 20% of the online course. Available in either the SWAYAM portal or from any other institution of higher education.

According to the FICCI report (2021), “it is true, and it really sounds nice, that our country’s education system has been greatly enhanced to promote online education with the New Education Policy. Online education is not only the finest crisis management tool available now, but it is also a blueprint for the future. Indians are the second-largest MOOC customers. There are roughly 3.5 million students enrolled in higher education in India, with approximately 900 institutions to meet this need. MOOCs will have approximately 14 million students in 2030, which is a four-fold increase in demand. India will need four times the number of universities, colleges, and instructors to fulfil this”.

Similarly, India might suffer a shortfall of 250 million qualified people across all industries by 2022. The NEP isn’t about getting a degree; instead, it concentrates on life skills and practical training. NEP is an online education portal where students may think outside of the box and turn their life skills into job-ready courses in a short amount of time. The government must open its eyes to the realities of e-content to establish standards for quality material and student equity in both schools and higher education. NEP creates a new path and transforms each student’s educational career into a digital one. It’s a path toward a comprehensive educational vision that will equip youngsters and children for skill-based education in the twenty-first century. NEP is a big supporter of open-source programmes that combine artificial intelligence, smart analysis, and well-structured information to promote learning in the context of gamified learning (MOOC-Personalising Universal Education Aspect, 2020).

1.4 MOOCs: Status in India

It's been a decade since MOOCs became popular. They currently have a total of 220 million students. According to a study from class central (Shah, 2021), over 300,000 people attended the free Stanford courses that launched the current MOOC revolution 10 years ago. MOOCs have already surpassed 220 million learners worldwide, excluding China, over a decade later. According to suppliers, over 3100 courses and 500 micro-credentials will be available in 2021 (Shah, 2021). In 2021, 40 million additional students enrolled in at least one MOOC, up from 60 million in 2020. In terms of subscribers and offers, the leading MOOC providers are:

Table 1.1 Enrollment in MOOCs in 2021

Platforms	Learners	Courses	Micro-credentials	Degrees
Coursera	97 million	6000	910	34
edX	42 million	3550	480	13
FutureLearn	17 million	1400	180	22
SWAYAM	22 million	1465	0	0

Source: ([By the Numbers: MOOCs in 2021], Shah, 2021)

Across 950 universities around the globe will announce or launch 19.4 thousand MOOCs by the end of 2021. Approximately 3.1 thousand new courses were added in 2021 (Shah, 2021).

1.5 Significance of the Study

Nowadays, MOOCs are very famous online learning platforms all over the world. It is very easy to join the courses on MOOCs. The learner has to sign into MOOCs first and they can log in from anywhere and anytime with the proper connection of the network. Otherwise, the course progress is not counted by the authority. Nowadays, learners cannot go out because of the pandemic COVID-19 and every educational institution has been closed for more than one year. So, the following are the major areas where the particular study will be significant in today's scenario. Such as:

1) Our Government and UGC have decided to teach online. UGC also notified that every university could not refuse any student for the credit mobility of courses earned through the SWAYAM platform. UGC has developed more than 145 MOOCs and offered more than 208 MOOCs on the platform of SWAYAM.

2) NEP 2020 also discussed the blended mode of learning in the field of teacher education and SWAYAM and DIKSHA portals would be used for teacher training programmes and standardized training programmes. They have taken so many digital initiatives in the field of education and they talked about the DIKSHA portal for an online national repository of high-quality resources on fundamental literacy and numeracy and digital libraries.

3) They also talked about introducing peer tutoring in education. Teachers will be recruited based on technology-based efficiency. So, it is seen that the upcoming world will take education not only in the conventional mode but education will be provided by the online mode also. The government is also trying to focus on the up-gradation of the design.

4) All the educationists should be prepared for the ongoing and upcoming education system and MOOCs will take a significant place over here. It will be impossible without the help of proper strategy of student engagement, the students' satisfaction, design of the courses like OERs, and attractive course design based on four quadrants of MOOCs. So, this study is very important from the perspective of the present situation.

5) UGC has already provided some of the lists of UG and PG courses on their website and the government of India has also declared that about 40% of the total courses will be provided online.

6) Students will get much more flexibility through this process of learning and they can upgrade themselves from the teachers and professors and their peers also. UGC has also allotted some specific universities for providing online learning in various courses.

This study provides significant insight to those learners interested in joining this kind of MOOC and they also understand the (Kumar & Kumar, 2020) several engagement patterns; such as behavioral, social, emotional, and cognitive engagements of the learners. The behavioural engagement will help to understand the student involvement in MOOCs. This will help understand the students' participation in different types of academic activities and efforts to perform academic tasks. The cognitive engagement will help to understand the integration and utilization of the student's skills, motivation, and strategies in their learning. The social engagement will help to understand the involvement of the students to the instructors and peers as well as their contribution in regular discussion. The emotional engagement will help to understand the level of self-

motivation of the students and try to find out their inspiration for that particular course which they have already attended.

This study will help to understand the student satisfaction on the basis of four quadrants of MOOCs. The researcher will find out the perception of the students on the basis of the four quadrants approaches in MOOCs. The course coordinator will also understand how the students have been involved in different disciplines of MOOCs concerning four quadrants. Thus, the study will help to understand the various relations between student satisfaction and students' engagement in MOOCs. The researcher is trying to find out the aspects of those parts that play a significant role in student engagement and satisfaction. If the students do not engage with the courses, they cannot understand whether they are satisfied or not. This study is trying to know the student satisfaction and engagement from the different aspects because The Ministry of Education is planning to provide their courses through the India-based MOOC platform SWAYAM. It is an upcoming project of the Government of India. Moreover, it will help the course coordinator to understand the lacunas how they can engage a large number of students in various online courses in different MOOCs platforms. They can also understand which factor affects the students more related to their satisfaction and engagement in MOOCs (Rajabalee & Santally, 2020).

We all know this is the time of pandemic COVID-19. We have seen that there is a massive change in the education system all over India. UGC has also approved full-fledged online degree programmes in 38 universities across India. Though India is a developing country and this kind of education system which the Government wants to provide, it's not very easy. So, basically, it is a paradigm shift in the education system. This kind of research had not happened before in this pandemic situation. Thus, the

researcher has chosen this topic for research. So, the researcher chooses student satisfaction in MOOCs concerning investigating the effect of student engagement and barriers.

1.6 Statement of the Problem

MOOCs are student-centric because any number of students can study at a single time. MOOCs have become a famous avenue for diverse learners to upgrade their knowledge and skills. However, sometimes we see that the rate of students' course completion is very low upto only 15%. There are various reasons behind it, such as, sometimes they want to explore and try to get experience on the MOOC platform and therefore, do not complete the course. The present research aims to study student satisfaction regarding the four quadrants of MOOCs with respect to their engagement with MOOCs. Hence, the problem of the present study entitled "A study of Student Satisfaction and Student Engagement in Massive Open Online Courses".

1.7 Operational Definitions of key terms

The operational definitions of the variables of the study are as follows:

I. **Student Engagement:** The students' engagement talks about what a student brings in the field of MOOCs in terms of behavioural, cognitive, emotional, and social engagement. It is because engagement plays a very important role in every work. Self-interest must be there; otherwise, it won't be fruitful (Lan & Hew, 2020). The engagement of students is created, co-created, and recreated through the lens of the identities and perceptions which is generally held by the students and the meaning and sense the student puts in of their experiences and

interactions. In the present study, the Students' Engagement comprises four dimensions and the description of these dimensions are as follows:

II. **Behavioral Engagement:** It is a type of engagement where students involve in massive open online courses from the aspect of time-management, note-taking, and making for the assignment as well as projects, and also revise notes when preparing assessment tasks.

III. **Cognitive Engagement:** In the present study, it refers to up-gradation of knowledge, incorporating data, skill development in the process of learning, and various ranges of memorization to use self-regulated strategies to promote students' understanding. During the massive open online courses, students search for further information other than what was provided by the course coordinator, go through the notes, and watch the video lectures for understanding (Lan & Hew, 2020).

IV. **Emotional engagement:** It mostly refers to students' feelings or emotions towards MOOCs. It reflects the student's inspiration to expand their knowledge, interest in various courses, and enjoy watching video lectures.

V. **Social engagement:** It refers to the interaction among diverse students and with their course coordinator as well.

VI. **Student satisfaction:** It is based on fulfilling their requirements and expectation in various MOOCs. In the present study, students' satisfaction considers satisfaction with the four-quadrant of MOOCs with respect to their characteristics. These are described as follows:

VII. **E-tutorial:** It describes satisfaction with e -tutorial in relation to organized content, covers all the learning outcomes, completion of the modules within the prescribed time and the self-assessment based on reflective level questions.

VIII. **E-content:** The e-content plays a very crucial role in the process of online learning in MOOCs. Satisfaction with e-content is considered in the context of organized content , content related to intended learning outcomes, suitable for all learners, the completion of the modules within time, and the self-assessment based on reflective level questions.

IX. **Discussion Forum:** A discussion forum is mostly utilised by the course organiser or his team to raise questions and explain them in near real-time. This quadrant has been explored extensively in the context of student satisfaction in MOOC platforms' discussion forums. Students should encourage themselves with the help of communication and cooperation with others. The course coordinator team and students usually provide feedbacks within the required time period. It focuses on building learners' confidence by promoting their participation in the discussion forums.

X. **Assessment:** Assessment, the fourth quadrant of MOOCs, is a vital component of online learning and plays a major part in the learning process. The satisfaction of students with assessment is considered in the context of providing feedback for the wrong attempt on the quiz to students, variety of objective questions are used for the assessment purpose, uses problem-solving approaches by giving them different projects, and checks the level of student creativity.

XI. **Student:** A student who has successfully completed at least one MOOC on any online platform is considered as a student.

1.8 Objectives of the study:

i) To create a model of student satisfaction in MOOCs.

ii) To create a model of student engagement in MOOCs.

iii) To study the student satisfaction and student engagement in MOOCs with respect to their demographic details.

iv) To study the relationship between student satisfaction and student engagement in MOOCs.

1.9 Hypotheses of the Study

The hypotheses formulated based on objectives are as follows:

i) There is no significant difference between male and female students with respect to their satisfaction in MOOCs.

ii) There is no significant difference among students of different educational backgrounds with respect to their satisfaction in MOOCs.

iii) There is no significant difference between male and female students with respect to their engagement in MOOCs.

iv) There is no significant difference among students of different educational backgrounds with respect to their engagement in MOOCs.

v) There is no significant relationship between student satisfaction and student engagement in MOOCs.

1.10 Delimitations of the Study

The study is delimited in the following way:

1) The study is delimited to those students who have not completed at least one MOOC are excluded from the research.

2) The study is delimited to only two variables- Student's Satisfaction, Student's Engagement.

3) The study is delimited to massive open online course offered in India.

1.11 Chapterization

The research report is presented in five chapters. The details of the chapters are as follows:

Chapter-I: This chapter contains a introduction, need, and significance, followed by the statement of the problem, operational definitions of key terms, objectives, hypothesis, delimitation of the study.

Chapter-II: This chapter consists of a conceptual framework and review of related literature.

Chapter-III: This chapter describes the methodology in details-the population, sample selection, method, tool used for the data collection for the study, tool construction, statistical techniques.

Chapter-IV: This chapter presents the data analysis and interpretation in detail.

Chapter-V: This chapter consists of major findings, discussion of major findings followed by a discussion of the study's educational implications. A few suggestions for further research in the area are also provided, followed by summary of the study. Fairly exhaustive bibliography follow the report. The bibliography is followed by a series of appendices about the study.

CHAPTER 2
REVIEW OF RELATED LITERATURE

CHAPTER 2

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2.1. Introduction

Research is a very careful and scientific process of investigation, mostly with the help of several searches for new and different facts in the various branches of knowledge. It may be characterised as the scientific application of multiple approaches and the discovery of various problems based on that investigation. The review is a very important part of the field of research. A researcher cannot move further without reviewing related studies regarding research, which helps the researcher find out the problems. Redman and Mory (2009) defined "research as basically a very systematic effort to acquire new knowledge. The review of related literature provides the background and several technical bits of knowledge to the researcher. The knowledge of what is already done in the particular area of research regarding specific methods, tools for gathering the various data, and analysis of the result are keeping the investigators systematic in their endeavour".

"Practically all human knowledge may be found in books and libraries," according to Best (1977). Unlike other animals, which start from scratch with each generation, man draws on the information that has been gained and documented in the past. His continual additions to the immense wealth of knowledge enable advancement in all fields of human endeavour.

A review of the associated literature, according to Creswell (2005), is "a written summary of journal articles, books, and other materials that summarises the previous

and present status of knowledge, classifies the literature into subjects, and shows the necessity for suggested research" (pp. 79).

So, the literature review is mostly based on the classification, presentation, and evaluation of what other researchers have written on the specific subjects and provide an elaborate discussion on that particular topic. The review of related literature is also helpful for developing and upgrading the conceptual or theoretical framework.

The review of related literature helps the researcher do the research quite different from the previous research problems. It also helps avoid the repetition and replication of the problems taken by several researchers. The study of previous research works truly provides a specific and exceptional outlook for selecting the study area. It helps to build up a gap in the previous research limiting those problems and defining them very clearly and precisely.

2.2 Conceptual Framework

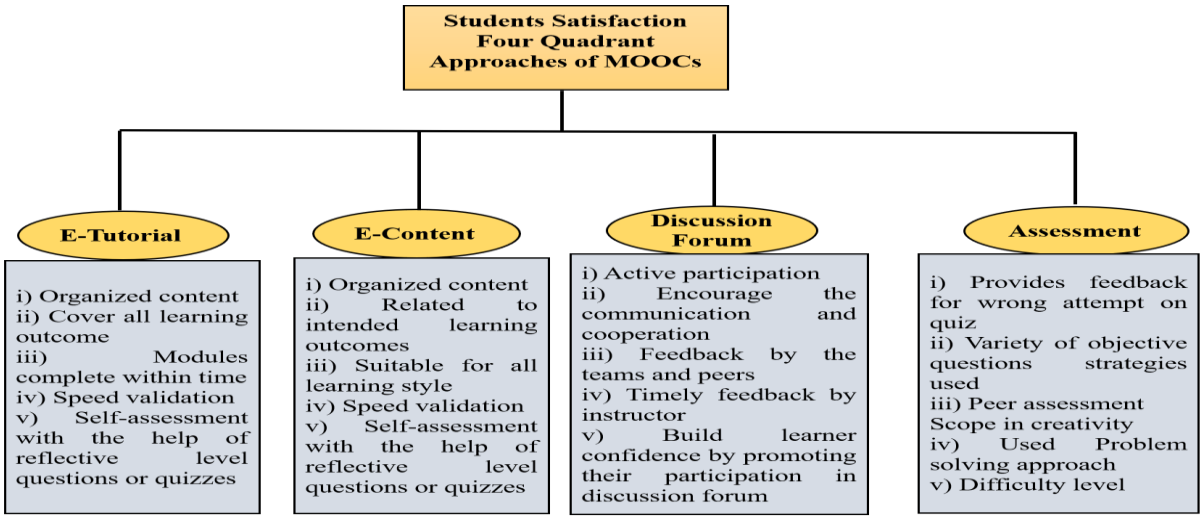
2.2.1 Student Satisfaction

Student satisfaction is conceptualized in terms of the four quadrants of MOOCs. Satisfaction is based on fulfilling one's requirements and anticipation. It is basically the judgment of a pleasurable level of consumption that is connected to the total fulfilment of a person's life. It is broadly accepted as a desirable outcome (Motselisi & Mokhethi, 2019) of different experiences of products and services (Hossain,2018). It can be measured by the views of the pleasurable fulfilment of one's wants and needs. Satisfaction is a state which is usually felt by a person who has already experienced performance (Ali et. al, 2016; Weerasinghe, 2017) or an outcome that fulfills one's

expectation and service quality (Santiuste et. al, 2015). It is also an important parameter of the educational field ofexcellence (Fredericksen et al., 2019).

The four quadrants are generally associated with course design, which is a technique for designing high-quality learning environments and experiences for students. Students may access knowledge, acquire skills, and exercise higher-order thinking via purposeful and planned exposure to instructional materials, learning activities, and interaction. Course design aims to provide students with the best possible learning experiences in an atmosphere that is both supportive and receptive to learning and intellectual growth (Boyd et al., 2020). Student pleasure should be the basis for student satisfaction. The following is a list of them:

Figure 2.1 Conceptual Framework of student satisfaction



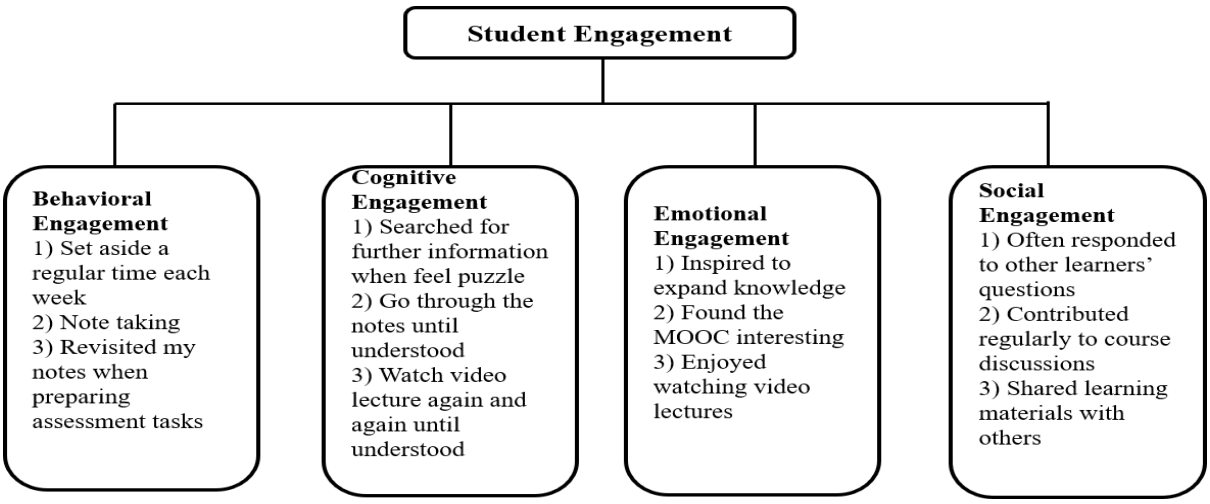
2.2.2 Student Engagement

Student engagement is defined from the perspective of persistence, self-direction, sustained inquiry, playfulness with content, and unprompted transfer of understanding (Heick, n.d.). There are four components of student engagement and the first finds that

engaged students must be attentive, in the sense that they pay attention and are entirely focused on the tasks associated with the work being done (Schlectly, 2009). The second component is about the student's commitment to their work.

They must participate willingly, that is, without the promise of extrinsic benefits or the danger of negative consequences, in the deployment of limited resources within their control, which are often time, effort, attention, and other resources that support the task's activity. The third component is related to the role of persistence of engaged students. They generally stick with the task even when the task presents difficulties. And the last and fourth component is that engaged students usually find the meaning and value in the different tasks that make up their work. As a result, student involvement refers to what a student brings to higher education in terms of specific objectives, ambitions, beliefs, and values and how they are formed and mediated by the student's experience. Students' participation is generated, co-produced, and recreated via the prism of their overall identities and views, as well as the meaning and sense they make of their experiences and relationships. In this research, the students' engagement is defined in terms of the following dimensions:

Figure 2.2 Conceptual framework of student engagement



2.3 Review of related literature on student satisfaction

Some of the relevant studies related to student satisfaction are given below:

Satisfaction is based on one's wants and expectations being met. It is essentially a judgement of a pleasant amount of consumption linked to a person's overall fulfilment. It is widely recognised as the desired effect (Motelisi & Mokhethi, 2019) of many types of product and service encounters (Hossain, 2018). It may be assessed in terms of one's satisfaction with fulfilling one's desires and requirements. On the other hand, it is essentially a post-consumption judgement (Asaduzzaman, 2013), which is assessed based on the consumer perspective of various goods and services (Siritongthaworn & Krairit, 2006). Finally, satisfaction is a feeling experienced by someone who has previously had a performance or a result that meets or exceeds their expectations in terms of service quality (Asaduzzaman et al., 2013).

It is also an essential criterion in the realm of educational quality. Student satisfaction is becoming a major challenge for higher education, particularly universities, and it has

been shown that student satisfaction is a major source of competitive advantage, as well as a source of student retention (Petruzzellis et al., 2006) and attraction for new students, as well as positive verbal communication. Higher education's long-term viability and survival relied on the quality of services provided and the efforts made to attain that, which differed from one higher education institution to the next (Arambewela & Hall, 2009; Aly & Akpovi, 2001; and Kanji et al., 1999). E-learning has recently emerged as one of today's educational system's most important learning strategies. Naturally, satisfaction in the context of e-learning refers to a particular student's attitude toward the e-learning system (Chen et al., 2004).

Determining user satisfaction is crucial in both higher education and business. The satisfaction metric must be applied to more than one attribute (Wang, 2003). E-learner satisfaction may be defined as a total of reactions to various e-learning activities (Wang, 2003). It is influenced by various factors such as user interface and content quality learning community, personalization, and learning performance. Oliver (1981) defined satisfaction as a succinct psychological state that occurs when the user's earlier feelings about the consumer experience are combined with the emotion around unmet expectations. As a result, while satisfaction is often articulated in an emotional, affective, and evaluative reaction, it does not have an uniform meaning (Kaul, 2016).

Student satisfaction may be described as the student's many perceived values and educational experiences at educational institutions (Horvat et al., 2013; Bolliger & Wasilik, 2009; Astin, 1993). There are still significant differences in students' perceptions of their online learning experiences (Muilenburg & Berge, 2005, p-29). Students' perceptions of their online learning experiences may influence their decision to complete the course and their overall happiness with their online learning

experiences (Carr, 2000; Kenny, 2003). According to the American Distance Education Consortium (ADEC, n.d.), student satisfaction is the most important aspect in continuing education. A variety of factors has impacted students' pleasure in the online learning environment. Students' pleasure is influenced by three major aspects, according to Bolliger & Martindale (2004)- the teacher, interaction, and technology (Hale & Petel, 2013). The other components are communication with all other course constituents, the course website, course administration difficulties, and the course management system. Furthermore, the correlation between students' judgments of task value and their self-efficacy and social ability, system quality, and multimedia teaching has been discovered as a highly important concept (Liaw, 2008; Lin, Lin, & Laffey, 2008).

Students must be confident in their ability to succeed in an online learning environment (Sloan Consortium, 2002). Students' contentment has also been connected to their academic achievement (Fredericksen et al., 2019). Furthermore, students' contentment is a crucial factor to consider while looking at the faculty of satisfaction. Student learning and instructor satisfaction are substantially connected (Hartman et al., 2000).

As a result, it is reasonable to conclude that student satisfaction is an essential learning component. When it comes to online learning, there is also a vital role. MOOCs are a sector that is getting much traction these days, and they provide a variety of courses via their different national and international platforms. Students are increasing the number of feathers in their academic cap. It offers credit scores that are essentially added to their higher education courses at the UG or PG level, and it has hosted a variety of curricular, skill-based, and continuing education courses. SWAYAM, or Study Webs of Active-Learning for Young Aspiring Mind, is a large national platform of the Ministry

of Human Resource Development and the Government of India that serves as an integrated portal and a well-known platform for hosting Massive Open Online Courses, or MOOCs. It has grown as a result of the NMEICT. The appropriate pedagogy delivers various courses depending on the specific courses. For its courses, SWAYAM uses a four-quadrant approach: e-content, e-tutorial, discussion forum, and self-assessment. This research is mainly concerned with MOOC content design.

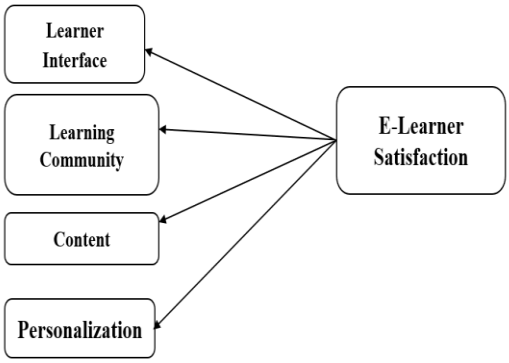
2.3.1 Models of Learning Satisfaction

i) Model of E-Learning Satisfaction (ELS)

In 2003, Wang was the one who came up with the E-Learning Satisfaction model. The four essential criteria evaluated in this technique are Learner Interface Quality, Learning Community Quality, Learning Content Quality, and Personalization Quality (Wang, 2003). Learning content quality is influenced by the degree of comprehending simplicity, supplying up-to-date information, and the contents that typically fit user roles. According to the International Data Corporation, "content quality customization is one of the most significant factors influencing end-user satisfaction, with a high preference for customised content" (Muntean, 2007). If the content quality cannot support the supply of personalised e-learning, the e-learning process would fail. Both portions are entirely integrated, which influences the cost and complexity of the e-learning system. The ELS instrument shows acceptable validity and reliability across a wide range of e-learning systems (Wang, 2003). Wang was the first to develop a comprehensive model and instrument for evaluating user satisfaction with an e-learning system (Tarigan, 2012). In this case, there are two main kinds of e-learning systems:

synchronous and asynchronous. Wang sought to construct the asynchronous mode instead of the synchronous mode in this circumstance.

Figure 2.3 E-Learning Satisfaction (ELS) Model



Source: Giray, 2021

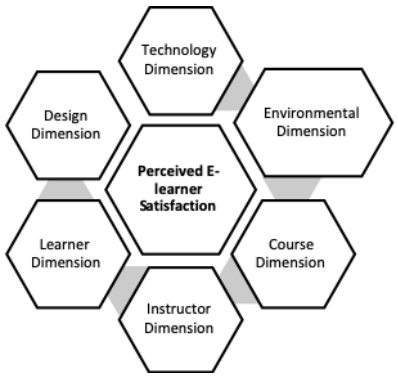
ii) The Acceptance Model for Technology (TAM)

The Technology Acceptance Model was developed by Davis (1989). It is one of the most important technologies adoption models. The two most important factors influencing one's willingness to utilise new technology are perceived ease of use and perceived utility. Usually, these affect students, and satisfaction emerged as the most significant parameter in studies trying to search the etimological relationship amongst the different variables and perceived satisfaction (Aebaugh, 2000). This model has three levels: the Deep level factor related to learning style, the Surface level factor related to gender, and the Cognitive factor related to online self-efficacy (Edmunds et al., 2012). On the basis of this model, different studies have happened and the researchers showed that there are different dimensions based on these three main pillars. The first one is ease of Used which is connected to easy to controllable, learn,

clear and flexible, understandable, easy to become skilful, easy to use (Sholikah & Sutirman, 2020). On the other hand, Usefulness is connected to making the job easier, working more quickly, increasing productivity, effectiveness, improving job performance and useful and lastly, Student's satisfaction is connected to self-efficacy and enjoyment. On the basis of this study, the researchers showed one more dimension-education service quality, which is connected to reliability, responsiveness, assurance, empathy, tangibles. The first two parameters are independent variables and the last two parameters are dependent variables. Furthermore, the study found that ease-of-use impacts education service quality via students' satisfaction. Ease of use and usefulness influence education service quality via student contentment, and that the variable of student satisfaction may interfere with the effect of ease-of-use and usefulness on education service quality (Sholikah & Sutirman, 2020).

Sun, Tasi, Finger, Chen, and Yeh (2008) looked at these elements that impact student satisfaction and the effects of perceived utility and simplicity of use (Ghazal et al., 2018). The research found that perceived ease of use substantially impacted students' satisfaction. The e-learning system delivers essential knowledge and assists students in their professional progress. Because of the simplicity of use of the e-learning system, students can devote their focus to studying the course topics rather than putting in the extra effort to master the instrument.

Figure 2.4 The Technology Acceptance Model (TAM)



Source: Jaradat & Al-Mashaqba, 2014

iii) Kano's Two-Dimensional Model

This model is basically based on customer satisfaction. This model helps the organization to understand the customer requirements (Chang et al., 2020). The Kano model is a famous instrument widely used to perceive customers' opinions to impact customer satisfaction (Wang et. al, 2010). Kano et al developed this model to classify the attributes of services or products and studied the connection between customers satisfaction and the functions of products or services. (Garibay et. Al, 2010). This model described the six dimensions of customers satisfaction. These are the following:

i) The first dimension is Attractive quality which is based on the quality of service is available, the consumers will be quite satisfied, but on the other hand, when the factors are lacking, the consumers will not be dissatisfied (Aref et al., 2012).

ii) The second dimension is that One-dimensional quality is available when the customers are satisfied and the higher degree of possession is satisfied more to the customers. On the other side, if it is not available, the customers won't be satisfied (Yang, et al., 2010). So, the supply of factors and satisfaction are linear.

iii) The third dimension is Must-be-quality based on the quality-of-service availability (Tontini & DagostinPicolo, 2013). Satisfaction is fully connected to this, otherwise, they get dissatisfied.

iv) The fourth dimension, Indifference quality, is based on the elements of the ministry that are available but are not responsible for the cause of satisfaction and dissatisfaction.

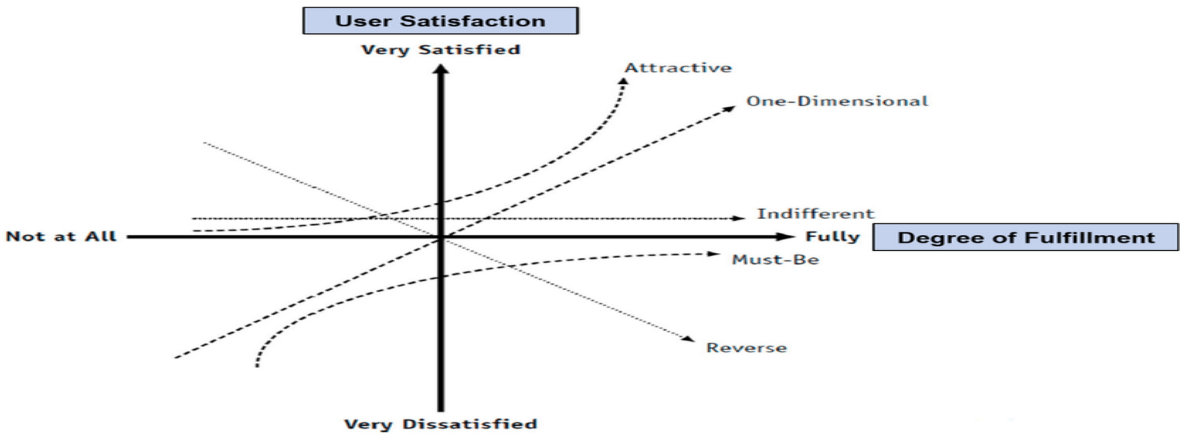
v) The fifth dimension is Reverse quality. The presence of this dimension is responsible for dissatisfaction and the absence of this dimension is responsible for satisfaction.

vi) The sixth and last dimension is Questionable elements and this is responsible when the customer or the information hasn't perceived the question hasn't been provided by the question is not sufficient or it can also happen when the customer is doubtful about the criterion (Chen et al., 2011; Wang et al., 2010; Garibay, 2010; Rashid et al., 2010 & Mirfakhrodini et al, 2009).

Arefi et al. (2012) showed in their study the application of the Kano model in the level of the quality improvement of higher education and focused on the level of satisfaction regarding the course materials. The data collection happened in two ways- functional and dysfunctional. This study showed that every dimension of the Kano model focused on the satisfaction or dissatisfaction of the students or customers. This model tried to identify and measure the better and worse values (Chen et al., 2019). The better value is basically achieved by adding up the attractive and one-dimensional quality and after that dividing by the sum by the total number of attractive, one dimensional, must be and indifferent responses.

On the other hand, worse value is achieved by adding up the one-dimensional and must be quality and divided by the total number of attractive, one-dimensional, must be and indifferent responses and put a minus before the answer (Chen et al., 2019). According to these two values, better value shows that the quality of improvement increases the student satisfaction level and on the other side, the worse value shows there is a lack of fulfilment of the quality, which decreases the level of satisfaction. So, user satisfaction is increased by content quality improvement (Gable et al., 2003). This study also showed that the up-to-date course material produced better value and students achieved a higher level of satisfaction.

Figure 2.5 Kano's Two-Dimensional Model



Source: Kano's Two-Dimensional Model (Kano et al., 1984, cited in Chen and Kano, 2011)

iv) The DeLone and McLean Model of Information Systems Success Model

DeLone and McLean developed the information system success model in 1992. This model seeks to measure a comprehensive understanding of information system success

by identifying, describing, and explaining the connection to the six most important and critical dimensions of success, which are commonly evaluated.

D & M Information System Success Model has six success dimensions. These are the following:

1) The first dimension is Information quality based on the content materials and this web content should be secured, complete, relevant, personalized, easy to understand. The satisfaction level is mostly related to this quality.

2) The second dimension is System quality which is based on the adaptability, availability, reliability, usability, and response time valued (for example, download quality) by the users of the e-commerce systems. So, this is also related to student satisfaction.

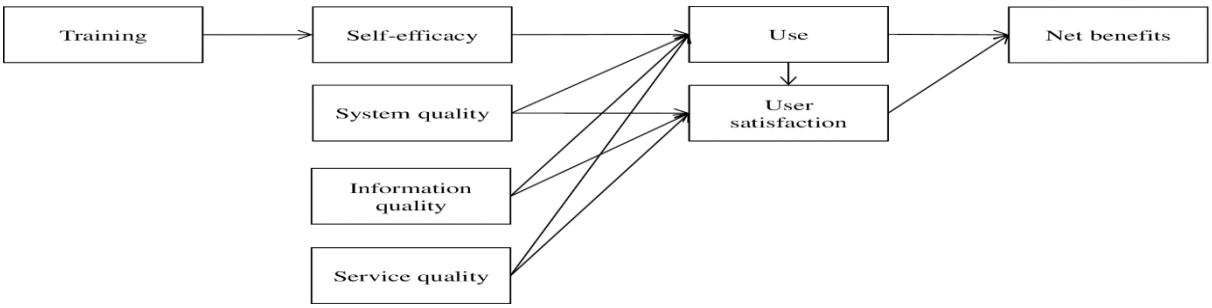
3) The third dimension is Service quality based on assurance, empathy, responsiveness. These are also depending on student satisfaction.

4) The fourth dimension is Use which is based on the navigation patterns, number of site visits, number of transactions executed, nature of the use of the resources. These are also providing the satisfaction of the students.

5) User satisfaction is the fifth dimension related to the customers' repeat purchases, repeat visits, and user surveys. These are also directly connected to satisfaction.

6) Net benefit is the sixth and last dimension of this model based on the incremental part, time savings, cost savings and these are also very beneficial for the level of satisfaction.

Figure 2.6 Information Systems Success Model



Source: Yu and Qian, 2018

To assess the performance of electronic health records in residential elderly care, researchers are developing a theoretical model and a questionnaire survey instrument.

Gable et al., 2003 presented enterprise system success assessment theory. Four parameters are somehow connected to the Information system success model. These are the following:

1) The first parameter is System Quality which is based on the ease of use, ease of learning, user requirements, system features, system accuracy, flexibility, sophistication, integration, customization. There are mostly related to the level of satisfaction.

2) The second parameter is Information quality based on Availability, Usability, understandability, relevance, format, conciseness. These are also fulfilling the satisfaction level.

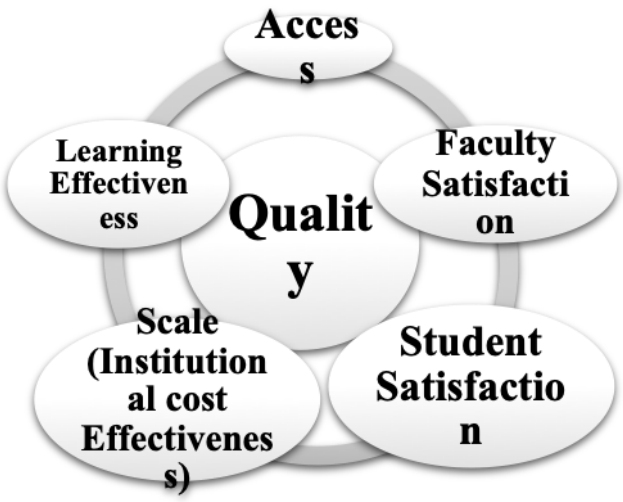
3) The third parameter is Individual impact based on learning, Awareness or recall, decision effectiveness, individual productivity. These are the very important components of student satisfaction.

4) The fourth parameter is Organizational impact based on the organizational cost, cost reduction, staff requirement, overall productivity, increased capacity, e-government, improved outcomes, business process change. These are very helpful to fulfil one's level of satisfaction.

v) The Online Education Quality Framework

The slogan consortium (Slogan-C) framework, the online education quality framework, and the online learning consortium's (OLC) five pillars of quality online education are all different names for the same framework developed by the Online learning consortium. The framework's previous name was Slogan consortium (Slogan-C). The framework's objective is to assist diverse institutions in identifying distinct goals and measuring progress toward them depending on the progress of activities (Moore, 2002). The five pillars of excellent online education- access, learning efficacy, cost-efficiency, student happiness, and faculty satisfaction were the foundation for this concept. These five pillars' quality must be assessed regularly (Moore, 2002). One of the five pillars is student satisfaction. The framework's origins may be traced back to 1997, when Frank Mayadas, the president of the online learning consortium, said emphatically that any student in online education must get an education that reflects the provider's overall institutional excellence. These five interrelated aspects have created the Slogan consortium's (Slogan-C) framework, and any kind of institution may show the quality of these five interrelated areas- access, learning efficacy, cost-effectiveness, student satisfaction, and faculty satisfaction (Rajasingham, 2009. P. 60).

Figure 2.7 Quality Online Education's Five Pillars



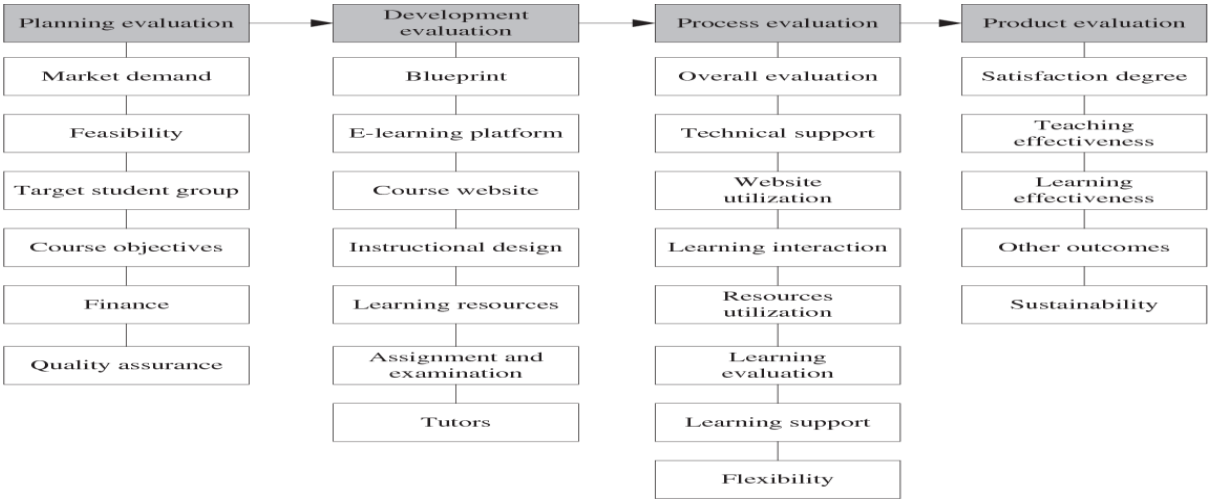
Source: Lee, 2010

vi) Building an Evaluation Model for E-Learning Courses

In the year 1960, Daniel Sufflebeam established the CIPP model for curriculum assessment in the subject of social sciences. Context, input, process, and product evaluation are all part of the CIPP paradigm (Zhang & Jiang, 2007). The researchers created an e-learning course model based on the CIPP concept. This methodology is used to assess the content resources for e-learning. Development evaluation, planning evaluation, process evaluation, and product assessment are the components of this evaluation methodology. In a nutshell, it's the PDPP model. Market demand, feasibility, target student group, course goals, funding, and quality assurance are all factors that go into the planning evaluation model. The course blueprint, e-learning platform, course website, instructional design, learning materials, assignment and test, and instructors are all part of the development evaluation. They discussed process assessment based on the overall course evaluation, technical support, website usage, learning interaction, resource utilisation, learning evaluation, various learning aids, and

flexibility. The last component of this strategy is product assessment, which is based on customer happiness, educational efficacy, other results, and long-term viability. The researchers chose some of the parameters for student satisfaction regarding e-learning characteristics, e-learning evaluation, and these 14 elements based on these four parts and 26 items- Virtual opening ceremony, Web site design, Lectures (video programme), Instructional design, E-learning course arrangement, E-learning study units, Communication with the mentor, Flexibility of learning, communication with peers, technical support, E-learning environment.

Figure 2.8 PDPP Model



Source: Zhang & Jiang, 2007

vii) Bigg's 3P Model

The teaching and learning process depends on Bigg's 3P model to some extent. The model was originally adapted from Dunkin and Biddle's (1974) three modes- presage, process, and product. Bigg's (1979) model mostly talked about these three aspects in the process of learning. These three aspects and its component are mostly connected to

the four quadrants in MOOCs and there are some reasons to choose this model as a conceptual framework of student engagement and satisfaction. These are:

The first aspect is rather an element connected to presage. It means the course provider in MOOCs and the instructor who plans the total course, as well as this element, is connected to the learner and platform also. The course provider in MOOCs can be anyone. There are many platforms that provide MOOCs to diverse learners and nowadays various also provide MOOCs to the learner throughout the world. The instructor has a very important role in MOOCs. Instructors influence the learners in several ways of learning, which helps them achieve several learning objectives. The learner is a very important part of MOOCs. It is because, without learners, the teaching and learning process cannot be successful. A huge level of diverse learners joins thesecourses and there are several reasons for joining these courses. Now the government of India has decided that some of the courses are mandatory for doing the students in MOOCs platform, like SWAYAM and after completing the course they will get full credit of the course and it will add with their results as well as they get the essence of online self-paced learning. Platform plays a very important role for any online course where students can engage themselves anytime, anywhere with any subjects. The course providers provide their courses through the platform only and it reaches learners all over the world. The platforms are SWAYAM, Canvas, Coursera, EdX, FutureLearn.

The second element is processed and this is connected to pedagogy and Instructional design. Its pedagogy mainly focuses on how the instructor leads diverse learners effectively and efficiently. The instructional design supports this kind of pedagogy to proceed further successfully. There are various steps in instructional design and the

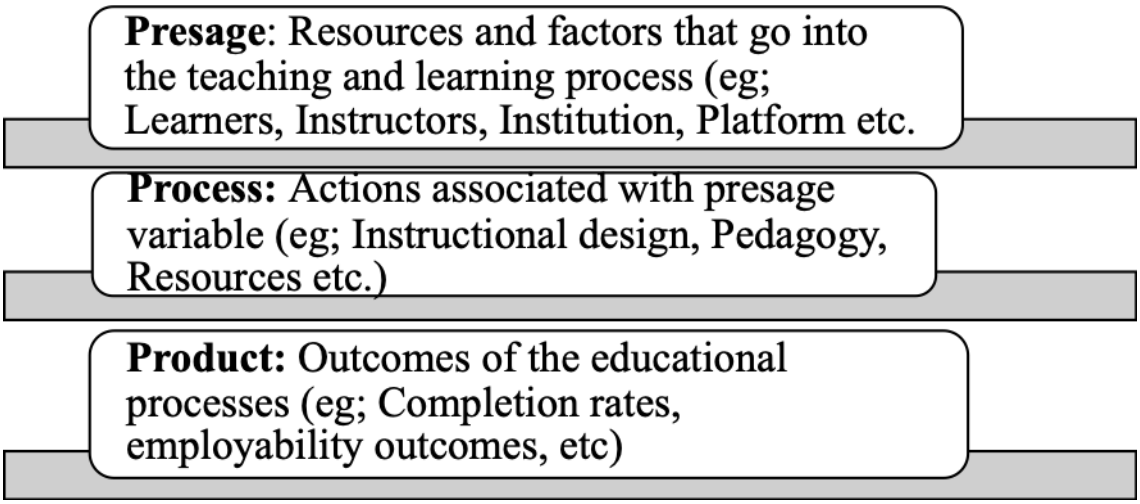
instructor should follow these very effectively (Hossain & Rahman, 2013). This design is mostly based on learning by doing and the instructor should follow the activity-oriented learning. It is basically a learner-centred model. The e-tutorial and e-content support individual learners and those web resources that are connected to acquire a deeper sense of knowledge and student willbe able to understand the relation between old and new knowledge and it's called scaffolding. Interaction and collaboration also play a significant role in the four quadrants of MOOCs. The interaction between instructor to learner and learner to learner is a significant part of online learning. There is a relationship based on learners' participation in the discussion forum and the completion of the course (Gillani et al., 2013; Sinha et al., 2014). The students who perform well and have higher cognitive engagement related to the specific course mostly participated in the discussion forum. There are opportunities to provide strategic feedback to peers and instructors regarding various types of questions. The analytics of learning also plays a very important role in learning.

The third phase is based on the product and it's connected to the particular learner and their learning. Here the course provider and instructor check the engagement level of learners in the discussion forum, giving the answers to quizzes and a routine engagement with e-content and e-tutorial. Interaction plays a very important role in synchronous learning. It is mostly based on the outcome of the learning process. The instructor can also measure the rate of completion of the courses and the outcome related to the scope of employability regarding the particular course.

Therefore, it can be seen that the engagement of learners and their satisfaction regarding four quadrants in MOOCs is fully connected to Bigg's 3P model. It helps the course provider and instructor measure the student satisfaction level towards the

specific courses. The quality of a course also depends on this process. So, the researcher has chosen this model and she will connect all those steps with the courses and quadrants in MOOCs.

Figure 2.9 Bigg's 3P model



Source: Hood & Littlejohn, n.d.

2.3.2 Different Views of the Learner Satisfaction

E-tutorial: An online e-tutorial mostly helps and encourages the students to self-study. The student learns as well as gathers ample knowledge and participates actively. The instructor usually designs and teaches specific courses for certain learning outcomes. The whole study is mostly based on certain objectives. Sometimes there are some reflective levels and self-assessment questions which is also helping the students to achieve certain objectives of the course. MOOC is a platform where e-tutorial plays avery important role in completing any courses on a certain platform. Tarigan (2012) described the different perspectives of student satisfaction. These are based on "learner interface quality", "content quality", "personalization quality", "learner support

quality". All the qualities are playing a very important role in student satisfaction. Learner interface quality is the basic requirement for any interactive system. If this quality is not sufficient, it hampers the methods of e-learning systems (Wang, 2003). This quality is based on different aspects and these are ease of use, stability of the system, ease to find out the contents and attractiveness, and including the use of various colours, fonts, text layout and it allows easy access to the content materials (Hisham et al, 2004), the model for learning session and identify what is important and what aren't (Allen, 2003).

On the other hand, Wentling et al, 2000 focused on user interface quality based on the overall look and feel of the e-learning system, the access of information to the learners. Zaharies et al, 2004 also focused on the instructional interface based on the course contents rather than focusing on how to use the learning contents (Lohr, 2000). According to Wang, 2003 focused on learner interface quality which is associated with the content design, usability, and stability of the e-learning system. He gave some indicators: the ease of use, stability of the several e-learning systems, ease of finding the content of users' needs, attractiveness related to the graphics, colours, and layout (Wang, 2003). Attractiveness plays a very important role in the e-tutorial system where students can pay their attention and interest properly (Hossain & Rahman, 2013).

E-content: The quality of e-content plays a very important role in an e-learning system. Without proper e-contents, MOOCs platforms cannot proceed further. Generally, the various types of content can be described as modules, learning objectives, and courses. Nowadays learning is based on student-centric and mostly technology-based. So, it can be said that the content should be designed very carefully for students and enhance student satisfaction. The quality of the content is added a

better and real value for the users (Azzam, 2006). Schramm (2010) also suggested that the satisfaction of e-learning depends on the content quality and it impacts on student satisfaction and the instruction related to the content should be very clear and distinct according to the course (George, 2004). Barron, 2003 also focused on content quality and its influence on student satisfaction with the personalized quality. He also said that students would choose the material quality that best suits their requirements. Each student has unique characteristics and expectations regarding the content quality that is more attractive to them and provides them with enough satisfaction in terms of course content quality (Barron, 2003). According to International Data Corporation, the amount of personalization on the content quality is the most important aspect in determining the user's level of pleasure (Muntean, 2007). Students will not be able to complete e-learning if the content quality does not allow for the delivery of tailored and personalised resources. As a result, the content quality goals should be highly clear and vivid, ensuring that students are satisfied and that the learning system's complexity is overcome (Muntean, 2007). According to Wang (2003), user satisfaction is largely determined by this quality, and he cited several indicators, including ease of understanding regarding explanations, up-to-date content, content that fits the user's roles and responsibilities, appropriate exercise and text, and links to other resources (Wang, 2003). Personalized quality is based on the demands and interests of the students, and it aids in the implementation of the perfect e-learning system design (Kahn et al., 2017). From basic to sophisticated, entire to portion, various approaches provide individualised e-learning quality. The level of complexity has a distinct impact on student happiness (Martinez, 2002). Wang (2003) found that the customization and personalization of e-learning course design meet the demand for student satisfaction.

The indicators are the material selected based on the needs of the students and provides adequate data (Wang, 2003).

Discussion Forum: A discussion forum is a very important part of any type of MOOC. It mostly posts different the support quality to the learners is based on communication with support mentors which affects student satisfaction. The context of communication is based on the feedback and responses for e-learning through email and telephone. Hisham et al, 2004 showed that the learner support quality based on the learning environment system which satisfied the learners. Warner, 2004 showed that automatic email support which mainly provides the related day-to-day information, is best for user satisfaction (Hisham et al, 2004). The learner support system can be in various forms, such as automatic email for the course enrolment and completion process. Proper functional support from the coordinator is related to the total non-infrastructure support, like complaints about related issues of the particular course. The infrastructure support is related to the IT-Service desk and it is connected with navigation, networking, failure of accession, failure of user name and password (Lee, 2006; Siritongthaworn&Krairit, 2006). User satisfaction is based on that particular course's user perception and opinions (Doll et al, 1988; Xiao, 2002). The researcher used a self-made questionnaire for collecting information based on previous studies and theoretical framework. On the basis of data and statistical calculations, the researcher showed that the four dimensions of e-learning satisfaction positively impacted students' satisfaction.

Anne,2020 showed his views on student satisfaction, and the researcher chose four collaborative interfaces. These are learner-content interaction which is mostly related to the quality of learning experiences of the activities of the course aligned to expectations, learner-learner interaction which is basically based on the interaction with

the peer groups, learner-instructor interaction which is based on the interaction with the course instructor or mentor and learner-online platform interaction which is based on orientation programme to online learning (Marcia Anne, 2020).

Assessment: Assessment, the fourth quadrant in MOOCs plays a very significant role in the process of learning. The different parameters of student satisfaction included academic achievement, performance, perceptions of the particular learning environment, persistence, success, and quality of the instructional design, content, and delivery (Artino, 2007 & 2008; Bolliger & Martindale, 2004; Kuo, Walker et al., 2013; Kuo et al., 2014; Moore, 1989; 10 Puzziferro, 2008; Reinhart & Schneider, 2001; Thurmond, & Wambach, 2004; Yukselturk & Yildirim, 2008). Stewart et al., 2004 showed the various components and dimensions related to the students' online learning satisfaction. These are the evaluative construction for the involved issues of students like the appearance web page, facilities regarding navigation, relevant hyperlinks, several instructional techniques, pertinent content delivery, prospects, and the environment of interaction. Bangert, 2006 showed that the four elements related to the evaluation of the courses fall on online blended learning.

The elements are interaction, active learning, time on task and student cooperation (Dziuban & Moskal, 2011).On the other side, Yin,2016 showed in his study that the perception of Chinese learners on MOOCs. Researchers showed that the aspect of instructional design of MOOCs contributes the most to user satisfaction or not. He found different aspects of the level of satisfaction on the basis of instructional design. He used a self-made questionnaire for the collection of information. He selected the level of satisfaction with the instructional design with the help of six dimensions. These are the content of the courses which is connected to the MOOCs and the sub-

dimensions are organization and structure of the course content, the richness of the content, up-to-date content materials, easily obtained course materials, the content meets the need of the user and the overall satisfaction of the learners. The satisfaction with the teaching methods is connected to some of the aspects and these are different methods of teaching, improvement of the ability on the basis of the course, whether the course is learner-centered or not, the course encourages communication and collaboration with the learners and instructors and overall satisfaction of the methods of teaching. The satisfaction with the evaluation and assessment process of MOOCs is related to the different evaluation methods, the effectiveness of the evaluation methods, quality of the grading system, quality of peer assessment, quality of feedback, quality of the final evaluation system, and the overall satisfaction of the assessment and evaluation process. Satisfaction with the discussion forums plays a very important role in MOOCs. There are different aspects, like the well-organized forum, the timely answer of the queries, helpful or not, participation activities, helpful discussion amongst the peers and mentors, and the overall satisfaction on discussion forums. The last dimension is satisfaction with the online learning environments. The different aspects of this dimension are simple interface, technical support, quality of the audios, videos, the other materials, methods of submitting assessments, ease of using discussion forums, and overall satisfaction. This research showed that almost 72% of the respondents are fully satisfied with the instructional design in MOOCs.

Yawson & Yamoah (2020) focused on understanding e-learning satisfaction in higher education from the perspective (Ghazal et al., 2018) of multi generational cohort perspective and tried to understand the students' satisfaction with the help of the four components of their experiences. The mentors provide course design based on the

details of the course outline, objectives of the course communicated, the tentative outcome of the learning shows the learners from the beginning, relevant and recent course content. The next dimension is course delivery which is based on the speaker's energy level and enthusiasm towards the topic, the sessions which are sequenced follow the course outline, the appropriate presentation of the topics, the coverage of the whole content throughout the session, achieved the outcome of the learning. The third dimension is course interaction based on the electronic forums available for discussion in e-learning platforms, fair and proper respect for student's interaction availability of the coordinators. The fourth and last dimension is the course delivery environment based on internet availability and proper infrastructure maintenance. Kumar & Kumar (2020) focused on the learners, satisfaction from MOOCs through a mediation model. They also showed that the level of learners' satisfaction is based on the content of the course, delivery of the content materials which is based on uploading the contents on time, pace, delivery of the contents by the mentor, assessment of the course, and different aspects of supporting the course. They showed that the content delivery and assessment significantly connected to the overall satisfaction level of MOOCs. On the other hand, course support was also found to be significant with the learners' overall satisfaction. According to the structural model of satisfaction, the relationship between course content and overall satisfaction is mediated by the course assessment and the course support is not mediating the relationship between the course delivery and the overall satisfaction (Kumar & Kumar, 2020).

Baldwin (2017), showed in his study of acceptance and adaptation related to online course design. Researchers showed that the course design directly impacts students' satisfaction. This study is basically highlighting the significance of the clarity and

vividness of course design, active participation in the discussion forum, and interaction with the instructor or mentor (Bradford, 2011; Paecher et al., 2010; Swan, 2001). The level of students' satisfaction has increased in online learning when instructors provide the proper feedback, communication is much more responsive, the instructional resources are relevant and the authentic activities play a very important role in online courses(Blau et al., 2017; Lee et al., 2011). Course design also influences the perception of the students in online courses as well as the satisfaction and the quality of learning. An effective course design originally emphasises interaction and communication amongst the learners and mentors. The online courses take more responsibility and time of designing the course materials rather than the face-to-face mode of learning. The transaction of online courses provides instructors with a proper opportunity to consider alternative instruction and assessment (Shea et al., 2004). This study is based on grounded theory. He had taken four parameters on the basis of students' satisfaction. The first parameter is online course design strategies and some of the aspects come under this parameter. Course design plays a very important role in student satisfaction, and navigation plays a major role in online courses. The mentor always tries to design the courses in the online mode that are very easy to navigate to get learners in front of the content. Navigation helps students to get the sessions very easily. Easy to navigate courses help the students and the instructors and it also helps the students to find information as early as possible and the course runs with more flexibility according to the participants. Chunking or breaking the contents related to the modules helps the students navigate the online courses. It helps students to understand the content materials very easily. The second thing is eye contact which plays a very important role in online learning. The third parameter is interaction with the peers and instructors on the discussion forum, asking different questions, getting

proper answers, active participation of each student is very important in online learning. The interaction basically provides a richer experience of learning for students. Online course design and the various teaching strategies help students interact on the particular course. Online education is more deliberate than face-to-face courses. The participants can understand the value of designing relevant and authentic assignments for online courses that facilitate the interaction between the student and the content (Stickney et al., 2019). Moore (1989) also identified the importance of interaction between student-student, student-content, and student-instructor (Cho & Cho, 2017). The study focused on student reflection on asking questions to one another in a purposeful manner and helping the learner learn collaboratively. It fosters interaction, provides feedback, facilitates learning and the course design organization. These same categories have been identified by Lewis & Abdul Hamid (2006). They showed that communication in online learning plays a major role in online education, the same result found by Christensen and Osguthorpe (2004). Roblyer & Wiencke (2004) also showed that the successful interaction of online learning provides better results, good experiences, and the course design objectives fulfilled by this. Pate et al. (2009) suggested that instructors should help the learners communicate in a better way and help them respond thoughtfully. Clark (1994) showed that instructional design is essential and provides a better impact on student satisfaction. The fourth parameter is a social order based on the online course environment where they can connect properly with their peers and the instructor. The behaviour pattern is different in online learning with respect to the traditional mode of learning.

Students get enthusiastic and more satisfied when they understand the communication between the instructor and students is very effective, they facilitate as well as

encourage the learners in their learning, organize the course in a very effective manner, the instructor shows interest in their learning and progress and evaluate students works accurately (Stickney et al., 2019). Marsh & Roche (1997) developed a complex model for identifying the student perception of satisfaction. The factors are the value of learning, the enthusiasm of the instructor, organization of the course, interaction with peers and mentors, coverage of the course, and proper assessment. Shea et al. 2003 study showed that feedback and interaction are significant for student satisfaction. The four factors related to student satisfaction- the student and instructor communication and interaction, amount of proper time on task, active learning, and cooperation with the peers (Bangert, 2006). Ice et al., 2007 showed that the students' perception towards the community and the instructor's presence in asynchronous learning with audio feedback in online courses. Gray & DiLoreto (2016) showed the effect of student satisfaction, engagement, and perception of learning in the online learning environment. They focused on the level of satisfaction concerning course structure and organization, the interaction between learner and instructor, and the presence of an instructor. Researchers used the mediation model (Baron & Kenny,1986; Shrout & Bolger, 2002) for measurement and cross-sectional design used for the survey method. This model also focuses on the course content structure, the interaction between learners, students' engagement with the level of satisfaction, and the students' perception of online learning. Course structure, learners' interaction, course organization are independent variables and student satisfaction is the dependent variable and student engagement is the mediating variable. The study found that the significance of course structure and organization is very important in the online learning environment and there is a significant relationship between learner interaction, student learning, and engagement with student satisfaction. So, the students'

satisfaction is a vital part of formal as well as non-formal education. Santiuste et. al, 2015 talked about the students' satisfaction with MOOCs and they mostly focused on the difference between formal and non-formal learning related to courseplanning, design, and assessment. This study showed that the students in formal education are satisfied with all these three parts, but on the other hand, in part of non-formal education in MOOC, students are not much satisfied with course planning, design, and assessment. Hew et. al, 2019 showed learners satisfaction in MOOCs and they focused on two main factors. These learner-level sentiment factors mostly focus on content, instructor, course structure, video, interaction, workload, difficulty, and course assessment. On the other hand, they focused on the course-related factors: the course schedule, different areas of MOOC courses, like arts or humanities, social science, science, technology, course design, and estimated course effort per week (Majumder, 2019). The study's findings are that the course structure, learner autonomy, and dialogue directly affect the learners' satisfaction, but the other factors do not fulfil the learners' satisfaction (Mondal & Majumder, 2019). In recent eras, many researchers have focused on MOOCs and the level of student satisfaction (Yousaf et. al 2017), but no comprehensive theoretical framework has been built regarding students' satisfaction in MOOCs (Hew et. al 2019). Though it can be said that the different aspects from different studies focus on the learners' satisfaction from various aspects, these are mostly related to the MOOCs platform.

Table 2.1 Different Dimensions of Satisfaction

Authors	**Dimensions of satisfaction**
Tarigan, 2012	Learner interface quality, Content quality, Personalization quality, Learner support quality
Stewart et al., 2004	Interaction, Active learning, Time on task, and Student cooperation
Marcia**,** 2020	Learner-content, Learner-instructor, Learner-learner, and Learner-online platform
Yin, 2016	The content of the courses, the teaching methods the courses used, The evaluation systems of MOOCs, The discussion forum, The online learning environment, The overall satisfaction
Yawson & Yamoah, 2020	Course Design, Course Delivery, Course interaction, Course delivery environment
Kumar & Kumar, 2020	course content, course delivery, course assessment and course support
Baldwin, 2017	Online Course Design Strategies- theme Navigation, Seeing online, Interaction and Social order
Dziuban et al., 2004	Learning value, Instructor enthusiasm, Rapport, Organization, Interaction, Coverage, and Assessment
Bangert, 2006	Student and faculty interaction and communication, Amount of time on task, Active and engaged learning, and Cooperation among classmates
Hew et.al, 2019	Learner level sentiment factors- content, Instructor, Course structure, Video, Interaction, Workload, Difficulty and Course assessment. Course related factors- course schedule, different areas of MOOC courses, like arts or humanities, social science, science, technology, course design and estimated course effort per week
Santiuste et.al, 2015	Course planning, Course design and Course assessment
Kuo et. al, 2014	Learner-content interaction, Learner-learner interaction, Learner-instructor interaction

Shea et al., 2004	Quantity and quality of interaction with instructor, Quantity and quality of interaction with fellow students
Swan, 2001	Course, Perceived learning, Perceived interaction with instructor, perceived interaction with peers, personal activity
Rajabalee & Santally, 2021	Overall academic experience, Achievement, online learning environment
Howson & Matos, 2021	Feedback on the Course, Feedback Overall, Academic Support, Academic Challenge, Student-Academic Relationships, Course Challenge, Assessment, Interdisciplinarity and Community Engagement
Sahni, 2019	E-learning, Classroom teaching
Bothaina et al., 2018	Academic dimension- course effectiveness, Skills and knowledge obtain Social dimension- Senses of belonging, Student interaction with other members Environmental dimension- Awareness and utilization of resources

All the above-mentioned studies showed that the students' satisfaction more or less related to the content design, learner interface quality, content quality, course structure, instructor, course structure, video, interaction, workload, difficulty and course assessment, course schedule, different areas of MOOC courses, like arts or humanities, social science, science, technology, course design (Hew et al., 2020) and estimated course effort per week, organization, learner interaction, instructor presence and communication, amount of time on task,student and faculty interaction, active and engaged learning, and cooperation among classmates, organization, learning value, instructor enthusiasm, rapport, interaction, coverage, and assessment, Online Course Design Strategies- theme Navigation, Seeing online, Course interaction, Interaction and

Social order, Course Delivery, Course delivery environment, course content, course delivery, course assessment and course support (Kumar & Kumar, 2020), learner-content, learner-instructor, learner-learner (Yu-Chun & Kuo1, 2014), and learner-online platform and these all are connected with the four quadrants of MOOCs with some extents. Different researchers also focused on some aspects that can identify the learners' satisfaction.

Students' satisfaction in learning plays a very important role in a different mode of the education system, whether online or offline. Satisfaction is basically depending on the maturity level of the individuals. So, it can be of various types and it has multiple dimensions. The E-learning satisfaction model basically connects with the interface quality of learners, several content qualities, and personalization quality. Content quality plays a very important role in students' satisfaction which is part and parcel of every learning. On the other hand, the TechnologyAcceptance Model connects with the learner satisfaction with self-efficacy through online and perceived ease of use(Jung & Lee, 2018) did not affect directly perceived satisfaction, and this was explained according to the individual experiences of learners and the maturity of the particular technology. It can be said that learning styles are also very important to determine specific learner satisfaction (Al-Azawei & Lundqvist, 2015). Kano's two-dimensional model talks about the learners' functional and dysfunctional parameters which are also directly connected to up-to-date course materials and the feeling of the individuals (Beelick, 2014; Pelletier et al., 2016). The Information System success model is also talked about the learning and their awareness to recall of the learners and it can be possible when they fully understand the course materials of that particular course and it also helps the learner to reach the ultimate goals of learning. PDPP model talks about

instructional design and it is one of the parameters of learning through online mode. Content design plays a major role in instructional design (Baldwin, 2017). These models are closely related to the students' satisfaction and different researchers gave their views on the basis of these models. A different study showed that students' satisfaction is mostly connected to the course design, course content, interaction of the course, learner and content relationship,course delivery environment. So, it can be said that the students' satisfaction mostly depends on the content design, and without this, any learning system cannot be established. Satisfaction of the students cannot be perceived directly, but it can be possible to share their views on the different aspects of the level of satisfaction.

2.4 Review of related literature on student engagement

Some of the relevant studies related to student engagement are given below:

In the present era, the learning method has been changed and teacher-centric learning has become student-centred. In the field of education, students' engagement refers to the degree of interest, attention, curiosity, perseverance, and values that the students basically exhibit when they are learning and being taught by the teachers (Abbott, n.d.). This originally extends to the level of inspiration, motivation, and commitment of learning, progress, development, and persistence in their way of learning. Student engagement is essentially the proper investment of time, endeavour, exertion and other relevant resources by both the students and their institutions intended to optimize the student various experiences of the students and also ameliorate the intended outcomes and development of students and their accomplishment and also the reputation of the institution (Trowler, 2010, p.6). It can also be said that the student engagement depicts

the willingness to participate in different activities in school which come under their routine, like attending different classes of different subjects, submitting the required wok for different subjects, and also following direction which has given by the teachers in the classroom situation (Nystrand & Gamoran, 1992). The National Survey of Student engagement is a best practices survey related to the students' engagement. The survey basically asks the students to report on how they choose to spend their time in higher education, recognizing that some uses of time produce more benefits to the different students than others. There are five benchmarks are related to NSS, these are mostly; level of academic challenge, active and collaborative learning, students' interaction with faculty, enriching educational experiences, supportive campus environment (Mandernach, 2015). The basic concept of student engagement is based on some assumptions related to the constructive method, and it is a type of learning that influences an individual and how an individual participates in educationally purposeful activities. In the field of learning, we can see that there are joint propositions and these are mostly depending on the institutions and the instructors, who provide students with the conditions, opportunities, and expectations to become involved in the field of higher education. Moreover, the individual learners are ultimately the agents in the discussion related to engagement (Coates, 2005, p.26). Student engagement originally refers to the degree of attention, passion, optimism, interest, a curiosity that students basically show when they are learning or being taught, which extends to the level of motivation (Deng et al., 2020) they have learned (Glossary of education reform). Students' engagement also occurs when various students make a psychological investment in learning. Students also try hard to learn what their school offers. Students are most engaged when they are totally involved in their work, persist despite various

challenges and obstacles, and take the most visible delight in accomplishing their works (Wikipedia).

Sometimes we can be confused between the engagement and task students are connected with. The term engagement is basically pointed out that is active. It mostly requires that students be attentive as well as in attendance. It also requires the student to be committed to the task and find some inherent value in what they are being asked to do. The engaged students not only do the task properly which is assigned to them but also do it in the most diligent way and full enthusiasm and it is an important part of engagement in the field of education and the others. On the other hand, the student performs various tasks because they perceive the task to be associated with a near-term end and give value (Ranjan, 2001.p.64). An Australian survey of student engagement defines student engagement. This survey says that the students' involvement in different activities and conditions probably generates a high quality of learning (Coates, 2009) and it measures along with six engagement scales. These are mostly Academic challenges related to the extent that is often related to expectations and assessments challenge and connected to the students' learning. Next is the active engagement of learning which is talking about the multiple efforts of students to actively construct their knowledge properly. Then the interaction between the instructors or staff and students is mostly related to the level and nature of the student's contact with the teaching staff. After that, they enrich the experience of education related to the participation in broadening the different educational activities. The next part talks about the supportive learning environment connected to the feelings of legitimating within the education sector. The last part talks about work-integrated learning, which is mostly connected to the integration of work experience into the study.

Student engagement is defined from the perspective of persistence, self-direction, sustained inquiry, playfulness with content, and unprompted transfer of understanding (Heick, n.d.). There are four components of when a student can be engaged and these are, first and foremost, the engaged students must be attentive, in the sense that they pay attention and are fully focused on the tasks associated with the work being done (Schlectly, 2009). The second component is that the student must have committed to their work whatever they do related to their study. They voluntarily, which means without the promise of extrinsic rewards or the threat of any kind of negative consequences that deploy scarce resources under their control, and these are generally time, effort, attention, etc., which basically supports the activity called for by the task. The third component is that engaged students must have persistent. They generally stick with the task even when the task presents difficulties. And the last and fourth component is that engaged students usually find the meaning and value in the different tasks that make up their work.

Therefore, the students' engagement generally talks about what a student brings in higher education in terms of certain goals, aspirations, beliefs, and values and how these are shaped and mediated by the experience of the whilst a student. Students' engagement is created, co-created, and recreated through the lensed of the identities and perceptions which the students generally hold and the meaning and sense of the student put in of their experiences and interactions. As the shapers of the context of education, the educational instructors need to foster educational and purposeful students' engagement to support and enable students to learn in constructive and powerful and potential ways and realize their capability not only in education but in the field of society also.

2.4.1 Nature of Student Engagement

The student engagement is basically motivated behaviour is indexed by the different aspects of cognitive strategies which the students can choose to use and by their cumbersome tasks for regulating their learning behaviour(Gordon et al., 2009) (Pintrich & De Groot, 1990; Pintrich & Schrauben, 1992). The various natures of students' engagement are:

1) It helps to improve the process of learning and teaching. The more engagement of students increases, the more educational instructors involve them in various difficult tasks, which will help the brainstorming of the students.

2) It helps to make and develop the curriculum more authentic and relevant. The proper curriculum always improves the engagement level of the students.

3) Its assistance encourages participation and makes the students' practice more democratic as well as in a very authentic way. The students were engrossed in the various types of their work very easily.

4) It helps to maximize the ways of learning in the field of higher education. The learner is mostly motivated intrinsically and does each and every work related to the study very smoothly.

5) It develops a healthy learning environment in the field of higher education and also promotes meaningful learning.

6) It mostly monitors the student learning outcome. It avoids monotonous, boredom, passive learning, and a lazy environment in higher education (Ali et al., 2016) and it

also prepare the active, alert, and smart global students who can think critically, rationally, minutely, creatively.

7) Students commence their life with full of eagerness to explore the world around them with the help of the fullest engagement of their study.

8) The central part of learning is the proper engagement of students.

9) When students are ready to learn in each and every way, such as- physically, socially, emotionally, and intellectually, they learn better than the others. According to Bloom's taxonomy, every part of learning is connected to the cognitive, affective, and psychomotor domains.

10) Student engagement is the product of motivation as well as active learning. We called it an outcome rather than a sum total because it will not fall out if either element is missing.

11) Engagement increases every odd and end that any student of educational and social background notwithstanding will attain their educational and personal objectives, acquire the skills and competencies demanded by the challenges of the 21st century, and also enjoy the intellectual and huge monetary advantages connected with the completion of the degree of baccalaureate.

12) Every student is individually different (Haggis, 2004). Engagement is basically a concept that encompasses the perceptions, expectations, and experience of being a student and the construction of being a student in higher education (Bryson & Hand, 2007). Engagement also underpins learning and it works like a glue that binds it together and both are located in being and becoming (Fromm, 1977).

13) The most powerful and deep learning is needed very strong engagement of students and several aspects help them in proper learning, such as- interaction between students and instructors, courses and many more.

2.4.2 Models of Student Engagement

i) Construction of Learning Behavioural Engagement Periodic Feedback Model

This model is based on empirical data analysis and it provides periodic feedback from the perspective of engagement. This model defines various dimensions, such as sustainability, initiative, reflection, and concentration, which mostly represent the behavioural engagement of learning. This model includes three levels- learning behavioural engagement, periodic feedback, and information exchange activity. The main part of this model is based on behavioural engagement. The middle layer is based on periodical feedback. The outer layer is based on the information exchange activity. The first layer is connected to the paradigm shift of the concepts and the change of learners' cognitive structure. The middle layer is connected to individual learning and also generates and maintains a higher level of learning behavioural engagement. The outermost level is connected to the continuous cohesion and reorganization of the behavioural sequence of learning that comes under the influence of subject, object, community, tool, intermediary, mixed learning environment, and the other factors to meet the needs of the learning very purposefully. The first and the middle layers interact between each other and the gradual flow of the middle layer is organized into the four elements. These are sustainability based on plans, behavioural strategies, execution of tasks, and evaluation. The various changes and reorganization of different elements in the middle layer mostly reflect on reflection- control over the plans,

behavioural strategies, and execution of tasks. The interaction between the middle and outer layers is mostly connected to the initiative that regulates periodic feedback and information exchange activities.

There will be no fulfilment of the previous elements without concentration. This model was originally based on the different patterns of engagements. Factor analysis is mostly used for the study to extract the principal components of variables and also regression method is used for the calculation. Moreover, the correlation coefficient between the different scores for each factor and learning results are calculated. According to the dimension activity index proposed, this model is basically relevant with the engagement and it describes behaviour engagement very clearly.

ii) Learner-Centric MOOC Model

The LCM model mostly consists of four aspects and these are Learning Dialogue (LeD), Learning by doing (LbD), Learning Extension Trajectories (LxT), and Learner Experience Interaction (LxI) and to combine all these aspects, a new dimension has been created which is Orchestration, it mostly shows the overview of LCM model (Murthy et al., 2018).

Learning Dialogue (LeD): It is mostly connected to e-tutorial, where short videos are there and learners can get the opportunity for a strategic pause point where the authority asks a question. It is important because active participation is an essential part of learning and through these, learners can recall, apply and evaluate the content and frame a proper answer without the help of others. The instructor also relates and anticipates the learners' responses and summarizes answers in the following parts of

the video. This pause point is called Reflection Spot (RS), which mostly prevents passive watching of the videos (Murthy et al., 2018).

Learning by Doing (LbD): It is mostly used for activities related to assignment and practice activities. LbDs normally follow Led and ungraded practice questions make these. They provide an opportunity to unify content explained in the Learning Dialogue. Formative feedback is provided to the learner for enhancing learning. It must be mentioned in the feedback and what kind of mistakes they make and how they improve it. Learners can achieve their ultimate goal through this and it must facilitate their learning (Murthy et al., 2018).

Learning Extension Trajectories (LxT): It is mostly connected to the extra resources provided by the authority. The student gets many related videos, content, web pages, and even research papers. These resources are categorized into two parts. The first part is related to the interest of learners. In order to amalgamate the notion in trajectories, learners must complete an amalgamation quiz depending on the trajectory they have selected (Murthy et al., 2018).

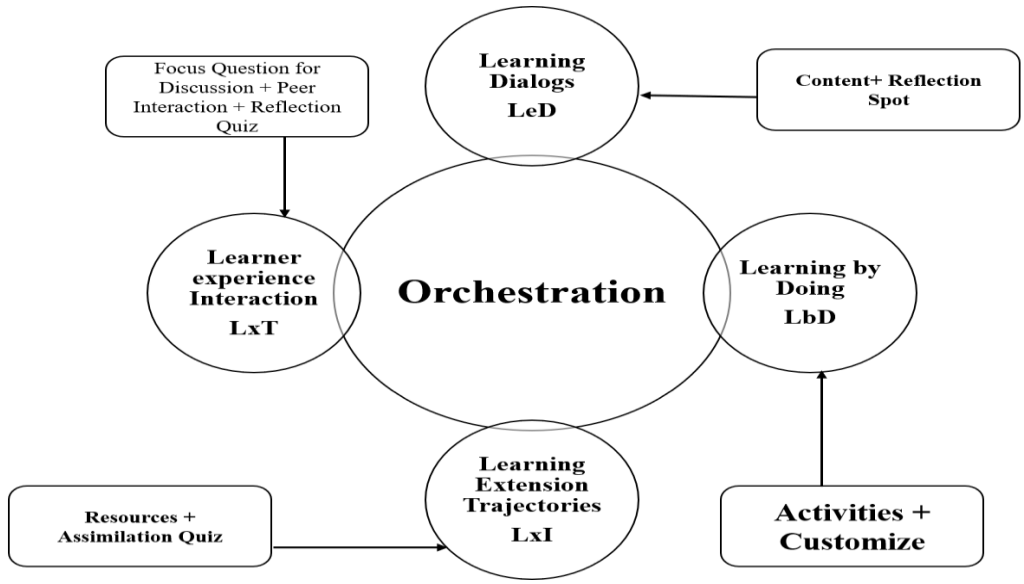
Learning Experience interactions (LxI): It is mostly connected to the discussion forum in MOOCs. There are some issues related to the scattered conversation, lack of significant participation, and meaningful interaction. The LxI design is mostly connected to overcome all those challenges and bring the learners into a discussion forum with the help of focus questions (FQs) which prevent scattered conversation and anchors discussions around a specific topic. Focus questions mostly drive the learners into the forum and participate in sharing their views, perception, and experiences and interacting with other learners and mentors on the forum. The graded reflection quizzes

(RQs) are based on the interactions on the discussion forum, thus incentivizing the level of participation and perusal of the post of different fellow learners. Learning experience interaction fosters the collaborative type of learning and creates an extra added learning resources pool within the course that is monitored and moderated by the course instructor, associates of teaching, and discussion forum moderators (Murthy et al., 2018).

The orchestration mostly connected to all the elements which are mentioned earlier and these all are created LCM principles in MOOCs. This is mainly measured and monitored by the learning process using learners' performances and reports. This allows periodical knowledge of various challenges encountered by participants. The appropriate measures are basically done to address the various challenges, such as providing a flexible time of live streaming of live interaction, when necessary, an extension of the mentioned deadlines, and reminder emails and text messages personally, which encourage more participation and also help to overcome the transactional distance envisaged in an online learning course. The implementation and orchestration of the LCM model require dedicated personnel and time commitments. This can be made possible by combined efforts of a larger course team comprising multiple focused groups or severalcommunities (Murthy et al., 2018).

This model is dynamic and open to illustration by the course creators looking to enhance the different learning outcomes and moreover, there is a scope for modifying the model of evaluation of elements. The model also lends itself to customize across several domains and diverse learners and has opened up research avenues (Murthy et al., 2018).

Figure 2.10 Learner-Centric MOOC Model



Source: Murthy et al., 2018

iii) Pedagogy of learner Experience Interaction (LxI):

The nature of MOOC pedagogy is mostly amplified from being instruction-focused which is mostly teacher-centered and after that, the focus has converted into learning which is based on learner-centered (Conole, 2014). The technology affordances of discussion forums in the platform of MOOCs further extends the pedagogy's nature for utilizing connectivist principles of autonomy, connectedness, diversity, and diversity (Downes, 2010). The pedagogy of learner experience interaction is mostly designed as a learner-centric MOOC pedagogy to enhance peer-connect to fulfil the aims of peer learning by incentivizing participation and anchoring in the discussion forum. Learning experience interaction mostly consists of three main organizing elements. These are:

1) Firstly, the instructor created a focus question to anchor discussions in the MOOCs platform.

2) Discussion forum is normally driven by MOOC learners and facilitated by course staff as per the learners' needs.

3) The instructor mainly connects reflection quiz to incentivize the mode of discussion. It exhibits the dynamics of learner experience interaction with the role of each MOOC platform highlighted. The instructor creates several focus questions and rules of interaction to proceed with the discussion. While framing the focus questions, an important discretion is to permit sufficiently different views from the MOOC learners to generate a shared platform. The preliminary role of facilitators in MOOCs' discussion forum is to ensure that discussion does not lead to pertinacious assistances. They are also encouraged to post their views and involve in a discussion forum with the MOOC learners. The reflection quiz is graded different activities following the discussion given below:

iv) Effectiveness of Learner Experience Interaction: Learners' engagement in discussion forums refers to the engagement of individual learners in discussion forum activity. When many learners engage in discussion forum activities in MOOCs, it is expected to lead to larger peer-connect. The learner engagement in MOOC was appraised through the number of discussion forum participants and the number of posts in the forum per week and the percentage of the active learners of the particular course who were forum participants.

2.4.3 Different Types of Student Engagement

Engagement in MOOCs is usually measured by whether learners complete learning activities or not, such as- watching lectures and submitting assignments. Low engagement is used as an indicator of at-risk learners. Nevertheless, studies of school

engagement have mostly proposed that engagement has three components and these are behavioural, cognitive, emotional and the others are participation or interaction engagement, transition, peer, social engagement, skill engagement, academic, student-staff, intellectual, online, emotional-peer relationship, beyond class, emotional faculty relationship engagement. To explore and measure the importance of cognitive engagement in MOOCs, researchers need to measure both the behavioural and cognitive engagement in MOOCs. The engagement also shows whether cognitive engagement adds other information that is beneficial in predicting academic achievement as well (Pelletier et al., 2016).

One of the main areas of the most commonly examined indicators of the teaching-learning process is student involvement. While it has the desired aim, defining it is difficult, therefore it is expressed in various ways, including student pleasure, enjoyment, interest in learning, classroom participation, persistence, and so on. Participation is often assessed using various methods, including surveys, observations, and interviews, each of which focuses on a different component of engagement.

Several authentic, validated, and reliable survey instruments are available to assess students' cognitive and behavioural aspects of students' engagement. There are different studies based on classroom engagement measures with the help of direct observation of students' behaviour in using the observation protocols (Kothiyal et al., 2013). This study is based on Deng et al., 2020 observation method with the help of measuring classroom engagement of the students and it gave a rich and clear picture to the researcher and after that, triangulation is used with observation data with a survey of the learners as well.

Behavioural Engagement: Most studies discuss learner engagement in MOOCs, which focused on behavioural (Deng et al., 2020) engagement in several academic activities. One of the most commonly used engagement MOOC indicators is participation in lecture watching, time spent on lectures, submitting weekly assignments, and the relationship between engagement and dropout (Chung & Mathew, 2020). It also refers to the participation of the students in several learning activities, like asking questions, completing projects (Fredricks et al., 2004). Researchers tried to investigate MOOCs behavioural engagement for discrete learning activities (Seaton et al., 2014), like using several videos for learning and notetaking (Veletsianos et al., 2015). Some of the studies have also documented behavioural engagement with several activities, tasks, and materials, which appeared as the pattern of progression (Moskal et al., 2015), the pattern of participation, and the pattern of using the course components (Campbell et al., 2015).

It aligns with the original model of engagement (Reschly & Christenson, 2012), which describes the draws on the idea of participation; it also includes student engagement in the field of academic and social or extra curricular activities as well as it is considered very crucial for achieving the positive outcomes and preventing the process of drop out (Fredricks et al., 2004). This engagement is also connected to participation in discussion forums, viewing lectures, following course activities, the number of times students accessed course wiki pages (Li et al., 2015; Santos et al., 2014; Sinha & Cassell, 2015) in MOOCs. The behavioural criteria also discuss active responses to the learning task presented.

Cognitive Engagement: It refers to the psychological investment in learning and various ranges of memorizing to use self-regulated strategies to promote students'

understanding. According to the study of Barlow et al., 2020, Cognitive engagement can be measured by how often students paused the lectures while they watched it in MOOCs. Some of the studies tried to explore the possibilities of using the video lecture clickstream data, the record of student clicks several events, and to measure cognitive engagement. Amongst all the click events, the several pausing events may indicate a higher level of cognitive type engagement. Sometimes, cognitive engagement explains the mental investment of the individual in learning of including the various complex ideas and master severe skills (Blumenfeld et al., 2005), and this is also related to the relevance or value, goal setting, self-regulation, strategizing as well as asking the question. MOOCs learners have mostly explored cognitive engagement by, exploring the influence of the learners' present role on self-regulated learning behaviour, which is basically indicating the learners who were mostly working as a data professional or studying for higher education qualification are appeared to be more self-regulated than those who are not (Deng et al., 2019; Hood et al., 2015). Cognitive engagement sometimes refers to the motivational goals of different students and self-governed learning skills (Christenson et al., 2012; Fredricks et al., 2004; Reschly & Christenson, 2012). Many research primarily focused on linguistic indicators, such as narrativity of text or cohesion connected to cognitive engagement, obtained from learners' different artefacts (Wang et al., 2015) concerning MOOCs. Therefore, it can be said that the MOOCs must account for the better quality of discourse as a representative for students' cognitive engagement. Cognitive criteria have mostly indexed the limitation to which students are mostly attending to and increasing the mental effort in the learning tasks might be encountered.

Affective engagement: Student engagement envisages their affective responses in the classroom situation, identifications of schools, valuing the method of learning, and the different sense of associating as factors that mostly characterize the affective engagement.

Emotional engagement: It mostly refers to the several feelings or different emotions of students towards teachers, other peers, or various modes of learning (Fredricks et al., 2004). The affective reactions are mostly based on attention, interest, boredom, happiness, stress, sadness, anxiety, and taking a course (Connell & Wellborn, 1991; Skinner & Belmont, 1993).

Participation or interaction engagement: It refers to the participation of diverse students in MOOCs platform and interaction with peers and instructors (Fredricks et al., 2004). It is also connected to learner-centred interactions in the mode of online learning environments, which affect the various ways related to students' experience in the course (Parker, 2013). It basically provides the students with a conceptual pellucidity to facilitate a good understanding of students' engagement in MOOCs.

Social engagement: It refers to the interaction between diverse students and their teachers as well. Students need to be ready to interact with their peers where student stats initiate interaction. Social engagement plays a very important role in learning, whether it will be offline or online. Moreover, students can engage in negotiation as well as scaffolding and gain the quality of interaction outside the classroom.

Academic engagement: It is mostly based on the students who spent time on several course activities, such as viewing the uploaded pages, pdfs, ppts, engaging with weekly quizzes, and various assignments (Appleton et al., 2006 and Reschly & Christenson,

2012). It is also connected to the number of days, weeks, and hours that are being engaged with a specific course, assessments, like homework and quizzes. Moreover, the rate of completion and accuracy, credit towards the completion of courses, and result of the post-test (Boyer &Veeramachaneni, 2015; Li et al., 2015).

Sun & Bin (2018) showed the features of learning behavioural engagement generally affect students' persistence and diverse learning achievement. Though the actual driving force of student actual performance, behavioural engagement indicated more active performance, extending an effective behaviour state. This study is mostly based on behavioural engagement which usually focuses on the adaptive adjustment process of different learners to appraise the exchange activities. The concept of MOOCs in the classroom is unique and it has different educational significance and virtuality. The main purpose of their study is to explore an automatic type of evaluation model for students learning based on behavioural engagement based on the behavioural data on MOOCs. So that a foundation for monitoring can be established in an extremely intelligent manner, and various individualised support of learning behavioural engagement may be provided. Behavioural engagement in the process of earning is based on several factors and these factors affect academic achievement, reforms of the teaching method, reflects the degree of support, and the promotion of students learning in various educational institutes. Miles also worked on this engagement and referred to the involvement in the task on time, the persistence of learning tasks, participation, and effort, which was sometimes individually or simultaneously related to the cognitive ability and academic achievements (Miles & Stipek, 2006; Li & Lener, 2013). This study is connected to the construction of learning behavioural engagement periodic feedback model and plan, behavioural strategy, task execution, and evaluation are

connected to sustainability, reflection, initiative, and concentration. This is an empirical study based on exploratory factor analysis and confirmatory factor analysis. As per the data analysis and result, the four main parts of the model are reasonable for measuring the behavioural engagement of the learners in MOOCs (Bolliger & Wasilik, 2009).

Philip et al., (n.d.) describe that how the production of several types of videos affects student engagement (Guo et al., 2014). It was an Empirical Study of MOOC Videos production decisions that affect student engagement in online educational videos. They used mixed method research for their study (Arbaugh, 2000). They tried to measure engagement by how long students watched each video and whether they attempted to answer post-video assessment problems. They used 862 videos, 127,839 Samples, and 6,902,358 watching sessions for data collection. They discovered that shorter videos are far more engaging, that informal talking-head videos are far more engaging, that Khan-style tablet drawings are far more engaging, that even high-quality pre-recorded classroom lectures may not make for engaging online videos, and that students engage with lectures and tutorials differently (Pathak & Mishra, 2021, Rummler, 2017). Video Production Affects Student Engagement (Guo et al., 2014). It was an Empirical Study of MOOC Videos production decisions that affect student engagement in online educational videos. They used mixed method research for their study. They tried to measure engagement by how long students watched each video and whether they attempted to answer post-video assessment problems. They used 862 videos, 127,839 Samples, and 6,902,358 watching sessions for data collection. They discovered that shorter videos are far more engaging than casual talking-head videos, Khan-style tablet drawings, and even high-quality pre-recorded classroom lectures that may not make for

interesting internet videos. Students attend lectures and tutorials in various ways (Mokhethi & Malunga, 2019).

2.5 Studies Based on Student Satisfaction and their engagement

Gray & DiLoreto (2016) showed in their study based on the several effects of engagement of the student, satisfaction, and perceived learning in the online learning environment. The researchers tried to investigate the different relationships amongst the structure of the course, organization of the course, the interaction between learners, engagement of the students, and instructors that are present on student satisfaction and the perceived learning. The researchers used a cross-sectional design using a survey method and there were 187 participants from the graduate level. Based on six hypotheses, the result was shown that the three factors related to hypothesis affect students learning. Course structure, the interaction between learners, and the presence of instructors all had a significant effect on the process of learning. Moreover, this was fully mediated by the cognitive engagement of students. On the other hand, another three hypotheses related to the factors affecting learner satisfaction are course structure and the presence of the instructor had found a significant direct effect. But the learner interaction did not have any significant effect on student satisfaction. There are three types of interaction: learner-content, learner-learner, and learner-instructor. The learner-to-learner interaction severely impacted student satisfaction (Kuo et al., 2013, p. 30). On the other side student engagement partially intercede the instructor's presence on student satisfaction.

Rajabalee & Santally (2020) mostly focused on their study based on learner satisfaction, engagement, and perception related to the online module and its

implication based on institutional e-learning policy (Sholikah & Sutirman, 2020). It's a correlational study that is based on 665 samples. Researchers used exploratory research for student engagement. They analyze the engagement based on psychological aspects. They focused on student acquisition of various new skills and several types of competencies (Majid et al., 2019). Study based on mixed-method research. Researchers mostly focused on students' overall academic achievement and experiences (Gunning, 2000). The student report based on the perspective regarding the achievement of learning outcome, the process of learner support, which included the tutor as well as peer support, the learning strategies and ways of tackling the various activities, and the encounter of different learning difficulties and how they engage in the process of resolving and tried to overcome different challenges (Delone & Mclean, 2014). The result related to satisfaction and engagement was weak, but there was a significant positive correlation between satisfaction and engagement with the overall performances. The feedback analysis revealed that the difficulties regarding technology and lack of instructor support created obstacles in front of them.

2.6 Research Gap

The perspective of the present study can be understood from the forty-two review of related literature review in the given chapter. After reviewing several research studies, the researcher came to enrich the thoughts and ideas in the related field of the study. The researcher also developed ideas related to research methodology that must be applied in the present research. Furthermore, it has enriched the researcher with a great theoretical perspective that mostly helps in framing various objectives, selecting the technique of sampling, developing tools, the procedure of data collection, and finally stating the research findings. All these considerations helped the researcher avoid

repetition and duplication of the particular research work. Although there are many studies on students' satisfaction and student engagement in massive open online learning from different aspects, there is a vast scope for investigation concerning student satisfaction with respect to the four quadrants in MOOCs and student satisfaction from various aspects.

In most of the studies, questionnaires and various scales were used for collecting data. The analysis of percentage, ANOVA, t-test, standard deviation, mean, and coefficient correlation was used for data analysis.

From the available resources and the knowledge of the researcher is concerned onthe review of related literature, the researcher did not come across any research work undertaken by neither Indian nor international level studies on student satisfaction and student engagement in massive open online courses (Yin, 2016).

Most of the studies adopted questionnaires to collect data and statistical methods for analyses. That literature showed that in many cases, the user did not use various tools for their information seeking to its full extent. The studies reviewed in this chapter enable the researcher is going to conclude that:

i) Most studies are based on a single discipline and specific platforms.

ii) Most of the studies are based on satisfaction and engagement separately or had been examined together, but a lack of studies combine the two variables in MOOCs in the Indian context.

iii) There is no standard tool-related for measuring student satisfaction.

iv) Most of the studies focused on the issues related to course design and interaction between instructor, learners and contents.

Therefore, the researcher has decided to undertake the topic for his research on "A Study of Student Satisfaction and Student engagement in Massive Open Online Courses" and hence the investigator has taken this as a research problem for the present study. The researcher applied the descriptive survey method and convenient sampling for selecting the sample. The researcher hoped that the study would prove to be a valuable contribution to the research field in the context of MOOCs.

2.7 Conclusion

The systematic review of related literature is the heart of the entire dissertation, other than a simple and small step is taken to complete the work. A proper and rigorous review of related literature is required for the proper justification of the research which the researcher takes. It is mostly related to the previous knowledge of the researcher connected to the research problem taken by the researcher that originally helps in fulfilling the gap between the former and the new as well as significant research problem. It also provides a theoretical and conceptual framework to the researcher. Moreover, these reviews give light to researchers for selecting the relevant methodology of the research. The study of related literature also helps researchers develop and generate a new theory and new methods for having proper knowledge that has been already done and mostly covered previously.

The review of related literature gives a proper insight to the researcher in any field and provides a proper guide to the suitable research problem and a proper methodology. Hence, the researcher reviews several fields related to the variables and quests for a

relevant insight to frame a research gap. Finally, the researcher must fill the gap by attempting the present study. The next chapter describes the methodology of the study.

CHAPTER 3
RESEARCH DESIGN AND METHODS

CHAPTER 3

RESEARCH DESIGN AND RESEARCH METHODOLOGY

3.1 Introduction

Research designs mainly a proper logical structure for a perfect inquiry. It is a general plan of how a researcher will answer his research question. It is a major issue in research that helps the preparation of the research design of the research project. The decisions are mostly connected to these questions, such as what, where, how much, by what means which is actually concerning an inquiry or a specific research study constitutes a proper research design. Research design obtains very satisfactory evidence for every research problem. The main function of a research design has originally ensured that the evidence obtained enables the researchers to answer the research question as clearly and vividly as possible. To obtain the relevant evidence entails mostly specifying the type of evidence the researchers need to answer that research question to test a specific theory, evaluate a programme, or exactly describe some phenomenon. The research design is mostly a study that helps to know and give the researcher of some perfect sense of the overall procedure, as well as the perfect kind of relationships among different variables that will be entirely investigated well-designed studies are basically the foundation of the proper scientific knowledge about the particular field in education. It provides the best benefits for the practice of education.

The research methods are normally made of the collection of data and the techniques of data analysis. The research methodology is mainly defined as the method which is systematic and helps to resolve the different techniques, providing an interpretation of related research data (Murthy & Bhojanna, 2009, p.32). There is a basic difference

between the method and methodology in research. The method is mostly based on the techniques which are used to gather evidence and on the other hand, methodology is based on the underlying theory and analysis of how research should proceed further by using such valuable methods. So, it can be said that the research methodology is the most important part of the research to execute the research in a very systematic and scientific manner. The present study is based on the survey method.

The Descriptive survey method is chosen in the present study as it is the best method to answer three types of questions addressed in the present study- descriptive questions, relationship questions, and predictive questions. The data was gathered through an online survey as it is considered best by the researcher for the need of the study.

Best (1986) explained that "descriptive research describes what is now occurring and that it entails the description, recording, analysis, and interpretation of the current situations. It involves some kind of comparison or contrast, and the goal is to identify the link between the non-manipulated variables that are already in existence".

3.2 Population of the Study

The population may be defined as a group of individuals with similar characteristics. For the present study, the population is the learner of MOOCs from all over India who have successfully completed at least one course in any MOOC on various MOOC platforms are included as the population of the study.

3.3 Sample of the Study

A sample is a small proportion of a population selected for analysis. Sampling is the foundation of research. It is essential for all research studies. The researchers demand a

sample that would truly reflect the whole population. This is the basic characteristic of good sampling. A good sample will produce results very much approaching the population and generalization will be effective. A representative sample can be collected with the use of probability sampling methods but due to certain limitations related to research time limit, cost of research and availability of data, the use of probability sampling is not feasible. Therefore, in the present research, the researcher has used the convenient sampling method which comes under the non-probability sampling method. The researcher uses this sampling to collect data of the students in MOOCs because the sample is taken from a group of people whose data is accessible in consideration of the research limitations. The researcher has taken those students from all over India who have already completed one or more than one MOOC.

First, the researcher contacted 7 course coordinators whose MOOCs are offered on different online platforms. The 4 MOOC course coordinators responded and agreed to participate in the study. The researcher shared the questionnaire with the course coordinators for further sharing with the participants in MOOCs.

The researcher received data from 415 MOOC participants from different platforms of MOOCs out of which only 240 participants who completed at least one MOOC are selected. Out of 240 participants, 132 males and 108 females from different age groups and different educational backgrounds constitute the final sample.

3.4 Tools Used

The selection or construction of a questionnaire to collect data for the study is an essential step in the process of research. Many types of research using readily available standardized tools available in the market to carry out the study, but in some cases, the

available tools are not suitable for the variable selected. In such a situation, the researcher prepares suitable tools to meet their study's needs and work adequately with the subjects selected for the study.

The researcher faced a similar situation of non-availability of required data collection tool, so the researcher developed a self-constructed questionnaire to collect the required information from the study of sample. The tool of student satisfaction, a study variable, has been developed based on available literature and is designed according to the study's objectives. The researcher prepared a questionnaire entitled "Students Satisfaction in MOOCs" for the present study. The tool contains all four quadrants in MOOCs, such as e-tutorial, e-content, discussion forum, assessment, and overall satisfaction as suggested by related literature. The researcher discussed with the specialists of the field and his research supervisor. The detailed process of construction of the questionnaire is discussed below.

On the other hand, the researcher will adopt a tool for student engagement, another variable. Deng et al., 2020 developed a tool on student engagement in MOOCs. They developed a scale named MOOC engagement scale (MES) (Deng et al., 2020) for full academic and research purposes. The MES should be used in the contexts where survey respondents or participants are taking MOOCs or have taken at least one MOOC before. Twelve questions were adopted to assess the engagement of learners in MOOCs. The MOOC engagement measure (MES) (Deng et al., 2020) was recently created and validated as a tool for assessing students' behavioural, cognitive, emotional, and social involvement in MOOCs. The appropriate Cronbach's alpha values (Chang & Chen, 2011) of behavioural, cognitive, emotional, and social involvement were 0.72, 0.70, 0.73, and 0.83, respectively, in this investigation. The MOOC engagement scale's

total Cronbach's alpha rating is 0.83,indicating a good level of internal consistency (Fraenkel & Wallen, 2003).

3.4.1 Construction of the Tool

The researcher did not find the standardized questionnaire of student satisfaction. Therefore, it was planned to develop the questionnaire to study the level of student satisfaction in the context of four quadrants in MOOCs. The researcher followed the steps during the construction of the questionnaire entitled students satisfaction in MOOCs as mentioned below:

3.4.2 Procedures for Construction of the Tool

There are general principles and procedures of construction of the tool described under the following headings and these are:

- Planning
- Item writing
- Preliminary draft
- Pilot study
- Item analysis
- Reliability
- Content validity
- Final draft

- **Planning:** The researcher prepared a questionnaire related to students' satisfaction and it aims to find out satisfaction among students regarding MOOCs. Due considerations were given to the variables tested and the different aspects involved, the items to be included, evaluation procedure etc. were planned in consultation with the experts.

- **Item writing:** The researcher created several elements addressing the tool's content, namely, student happiness in MOOCs, after a comprehensive and rigorous review of books, articles, journals, magazines, research publications, and newspaper stories connected to student satisfaction. An in-depth examination of the research issue was conducted to determine the primary elements of the study, which was used to develop the questionnaire. Based on the goals and underlying research, specific factors to be assessed were determined. The questionnaire's items are designed to gather data on student satisfaction.

- **Preliminary draft:** The researcher prepared 27 items for measuring student satisfaction. The items were edited and carefully worded with instructions of the tool. The final manuscript of the preliminary draft was sent to the supervisor and four other professors of different departments of CUH and other universities. Overlapping and ambiguous items were modified based on their suggestions. Then, the necessary modification, the preliminary draft was printed.

- **Pilot study:** To check the tool's usefulness and determine the deficit, a pilot study was conducted. Fifty students were included as respondents for the study. After the trial questionnaire was modified, reliability was assessed using the SPSS-22 software and content validity of the questionnaire was established.

- **Item analysis:** For choosing the related and reliable items to the tool, the researcher used the data collected from 50 students who have completed at least one MOOC or pursued any MOOC and computed Cronbach's alpha value(Chang & Chen, 2011).

$$\alpha = \frac{K}{K-1} * \left(1 - \frac{\sum_{i=0}^{K} s_i^2}{s_t^2}\right)$$

Table 3.1 Before the Item Analysis Cronbach Alpha Value

Cronbach's alpha	Cronbach's alpha based on standardized items	Number
.967	.965	27

Above table 3 shows that 0.967 is Cronbach's alpha (Chang & Chen, 2011), which is a high level of internal consistency of the tool.

Table 3.2 Item-Total Statistics

Item-Total Statistics

No. of Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
VAR00001	53.97	528.852	.913	.	.965
VAR00002	53.77	535.476	.850	.	.965
VAR00003	53.94	542.232	.765	.	.966
VAR00004	53.63	554.182	.652	.	.967

VAR00005	53.83	541.029	.833	.	.965
VAR00006	53.77	550.182	.622	.	.967
VAR00007	53.49	537.316	.803	.	.966
VAR00008	53.60	535.541	.803	.	.966
VAR00009	**53.71**	**552.681**	**.634**	**.**	**.967**
VAR00010	53.80	542.576	.779	.	.966
VAR00011	**53.51**	**549.610**	**.558**	**.**	**.968**
VAR00012	53.77	545.829	.728	.	.966
VAR00013	53.54	546.020	.715	.	.966
VAR00014	53.69	536.928	.889	.	.965
VAR00015	53.71	540.681	.864	.	.965
VAR00016	53.46	538.785	.791	.	.966
VAR00017	53.54	535.373	.858	.	.965
VAR00018	53.83	536.029	.872	.	.965
VAR00019	53.60	539.188	.743	.	.966
VAR00020	54.09	553.963	.705	.	.966
VAR00021	54.09	554.375	.696	.	.966
VAR00022	**53.54**	**571.432**	**.265**	**.**	**.970**
VAR00023	53.97	554.264	.663	.	.967
VAR00024	**53.83**	**563.382**	**.441**	**.**	**.968**
VAR00025	53.97	553.852	.653	.	.967
VAR00026	**53.91**	**556.551**	**.595**	**.**	**.967**
VAR00027	**53.97**	**556.382**	**.546**	**.**	**.967**

Note: The bold items indicate deleted items

The above table shows the items or statements 9, 11, 22, 24, 26, and 27, resulting in a lower Cronbach's Alpha. Therefore, the researcher wanted to remove the items or statements 9, 11, 22, 24, 26, and 27. Finally, the tool consists of 21 items after the item analysis process.

After finalizing the item analysis strategies, the researcher prepared the final draft of the tool. Out of the total 27 items, 6 items were rejected and 21 items were selected for the final draft of the tool. Therefore, the ultimate draft of the tool consists of 21 items on a five-point scale.

- **Reliability of the tool:** The test-retest method was used for calculating the reliability of the tool. The researcher used the test-retest method for the reliability of the tools. In the present study, the researcher employed Cronbach's alpha to establish the tool's reliability. The reliability of the tool is 0.985

Table 3.3 After the Item Analysis Cronbach Alpha Value

Cronbach's alpha	**No. of Items**
.985	**21**

Above table 3.2 shows that .985 is Cronbach's alpha, which indicates a high level of internal consistency of the tool. Therefore, the tool is reliable.

- **Content Validity:** After preparing the final questionnaire, the tool's content validity is ascertained based on expert judgment. The experienced guides, educational technology experts, senior faculty in the computer science department, and instructors of MOOCs were provided copies of the questionnaire, objectives of the study, and a description of the tool's dimensions. Experts have expressed their

judgment on each proposed item to a high degree of satisfaction. Hence, the content validity of the questionnaire was established.

- **Final Draft:** For each classification, all favourable utterances were given a score ranging from a maximum of two to a minimum of one. The tool's final draught consists of 21 components. The tool's scoring technique is outlined below.

Table 3.4 Scoring Pattern of Rating Scale of Student Satisfaction

Responses	**Scores**
Strongly disagree	1
Disagree	2
Neither agree nor disagree	3
Agree	4
Strongly agree	5
Minimum Scores:**25**	Maximum Scores:**125**

Above the table shows that scoring of student satisfaction tool or questionnaire is done according to the instruction given as each item has two responses which agree and disagree. For all close-ended items, 1 & 2 were given for agreeing and disagreeing, respectively.

3.5 Administration

The tools were administered to the students in MOOCs who have completed at least one course in MOOCs. The researcher sent three reminders for seeking cooperation in completing the questionnaire. Finally, it took 50 days to collect data from the respondents, and in the end, the researcher got 240 filled-up questionnaires from respondents.

3.6 Variables of the study

The researcher has adopted these two variables- student satisfaction and student engagement. The researcher has adopted the following demographical variables for the present study to do the analysis. Such as gender (male and female), and educational background (pursuing UG, UG, pursuing PG, PG, pursuing Ph.D., M.Phil/Ph.D., professional courses).

3.7 Statistical Techniques

In the present study, the researcher used Pearson's coefficient of correlation, mean, standard deviation, student 't'-test, ANOVA, and principal component analysis (PCA) for data interpretation and analysis with the help of SPSS statistical software and Microsoft Excel 2007.

This chapter goes through the sample study approach, the tools utilised in the research, and the statistical methods employed in the investigation. The following chapter contains the analysis, interpretation, and discussion.

CHAPTER 4

ANALYSIS AND INTERPRETATIONOF DATA

CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

4.1 Introduction

Chapter four analyses and interprets data based on the research design adopted in chapter third, research design and methodology. The present study aimed to determine student engagement and satisfaction among the students who have done at least one course in MOOCs. To study student satisfaction, a self-made questionnaire was developed for data collection. On the other hand, the researcher has adopted a standardized tool for data collection. For a better understanding of the challenges faced by the students, the qualitative method was also adopted.

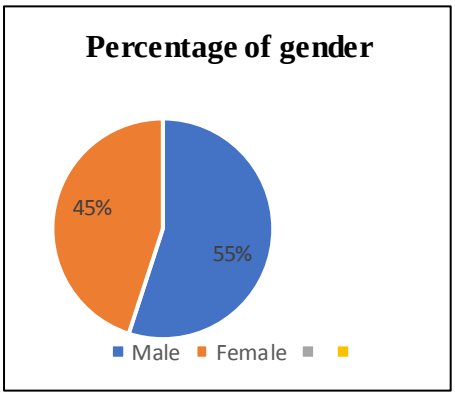
The researcher used mean, standard deviation, percentage analysis, student 't-test, ANOVA, Pearson's coefficient of correlation, principal, component analysis (PCA) in this chapter. The researcher has presented the collected data and its interpretation by using statistical calculations with the help of SPSS-22 statistical software and Microsoft Excel 2007. The collected data was classified, organized, and analysed for testing the hypothesis formulated in the present study.

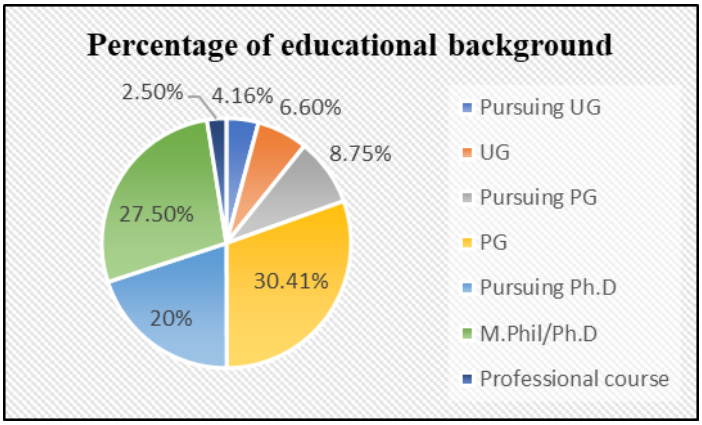
4.2 Representation of Data

Data of the present study is collected from those students who are in the field of higher education and completed at least one course in MOOCs. The data obtained from the sample through the administration of the developed tool have been subjected to descriptive and inferential analysis in tune with the stated objectives. The analysis of

data is presented in the form of tables, graphs, and charts below and further discussed after the tables and graphs:

Graph 4.1 The graph shows demographic sample distribution





The above table presents the division of the sample in terms of attending at least one course in MOOCs. As seen from the above table, 132 (55%) males and 108 (45%) females have taken for the study. The researcher has also taken the students from different backgrounds based on their educational programme such as 10 (4.16%) participants are from pursuing UG programme, 16 (6.6%) participants from UG programme, 21 (8.75%) participants from pursuing PG programme, 73 (30.41%) participants from PG programme, 48 (20%) participants from pursuing Ph.D.

programme, 66 (27.5%) research scholar and 6 (2.5%) participants from professional courses constitutes the sample.

4.3 Statistical Analysis and Interpretation

Objective 1 To create a model of student satisfaction in MOOCs.

Table 4.1 KMO and Bartlett's Test of student satisfaction

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	**.796**	
Bartlett's Test of Sphericity	**Approx. Chi-Square**	2297.017
	df	210
	Sig.	.000

The above table represents that the score of the KMO measure of sampling adequacy value of the 21 factors is 0.796, which is greater than 0.65 concerning student satisfaction in MOOCs. According to Field (2005), this value is acceptable and considered perfect. The KMO score is .796 to above and the interpretation of the score is good, indicating that principal component analysis can be carried out if the KMO measure of sampling adequacy is more than 0.65. Bartlett's test of sphericity is 0.000, which also shows a significant value of the factors and $p<.05$; thus, representative of the sample is suitable for principal component analysis (Malhotra & Dash, 2012). Here, the Chi-square is 2297.017 and the p-value of .000 implies a high probability of obtaining this result.

Table 4.2 Total Variance Explained of student satisfaction

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings				
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
SS 1	6.068	28.894	28.894	6.068	28.894	28.894
SS 2	2.541	12.101	40.996	2.541	12.101	40.996
SS 3	1.732	8.247	49.243	1.732	8.247	49.243
SS 4	1.466	6.983	56.226	1.466	6.983	56.226
SS 5	1.139	5.424	61.650	1.139	5.424	61.650
SS 6	1.104	5.258	66.908	1.104	5.258	66.908
SS 7	.965	4.594	71.502			
SS 8	.884	4.207	75.709			
SS 9	.801	3.817	79.526			
SS 10	.665	3.168	82.694			
SS 11	.570	2.715	85.408			
SS 12	.493	2.347	87.755			
SS 13	.458	2.179	89.934			
SS 14	.386	1.836	91.770			
SS 15	.350	1.669	93.439			
SS 16	.313	1.492	94.930			
SS 17	.290	1.383	96.313			
SS 18	.242	1.150	97.463			
SS 19	.211	1.003	98.467			
SS 20	.197	.937	99.404			
SS 21	.125	.596	100.000			

Extraction Method: Principal Component Analysis.

Table 4.3 Component Matrix of student satisfaction

Statement	Components			
	1	2	3	4
SS1				.532
SS2				.728
SS3				.667
SS4		-.548		
SS5	.527			
SS6			.604	
SS7	.685			
SS8	.609			
SS9	.605			
SS10	.508			
SS11			.578	
SS12	.596			
SS13	.668			
SS14	.492			
SS15	.658			
SS16		.746		
SS17			-.637	
SS18	.757			
SS19	.553			
SS20	.685			
SS21	.582			

Extraction Method: Principal Component Analysis

6 components extracted.

The above tables represent the grouping of variables under four components: variables 5,7,8,9,10,12,13,14,15,17,18,19,20 and 21 under the component 1, variables 4 and 16 are grouped under component 2, variable 6 and 11 are grouped under component 3 and variables 1 and 3 are grouped under component 4. The primary objective of the principal component analysis is to investigate the effective dimension of student engagement in MOOCs. The data were analyzed through SPSS-22 to summarize the 21 variables of the questionnaire demonstrating student satisfaction in MOOCs. The data were subjected to PCA, under exploratory component analysis. According to the cumulative percentage, 56.22% is good for measuring the validity of a tool and it shows that the validity of the question refers to accuracy of the method to measure what it intends to measure. The maximum variance is created by the first factor i.e. 28.89% variance of the total cumulative percentage.

The table demonstrates that component (factor)1 represents the customized course content based on student satisfaction where students are connected with different aspects, such as; self-assessment with the help of reflective level questions or quizzes, related to intended learning outcome, suitable for all learning styles, speed validation of the course, encourage communication and cooperation, feedback by the teams and peers, feedback by the instructor, build learner confidence by promoting their participation in the discussion forum, peer assessment, scope in creativity, problem-solving approach, difficulty level. Component (factor)2 represents student satisfaction based on feedback provided by course coordinator for wrong attempts made by learners and speed validation of e content. Component (factor)3 represents student satisfaction based on interaction with the organized content, a variety of objective questions

strategies used, and active participation as well. Component (factor)4 represents student satisfaction based on video content where students are connected to organized content which covers all learning outcomes, and can be completed within the presribed ime. The researcher has taken a self-prepared tool for measuring student satisfaction, the scale named student satisfaction in MOOCs. After checking the validity of the questionnaire, it shows good results and the tool is applicable for the population where the tool has been used and therefore, the results are used to create a model of student satisfaction with MOOCs

Figure 4.2 Current Model of Student Satisfaction

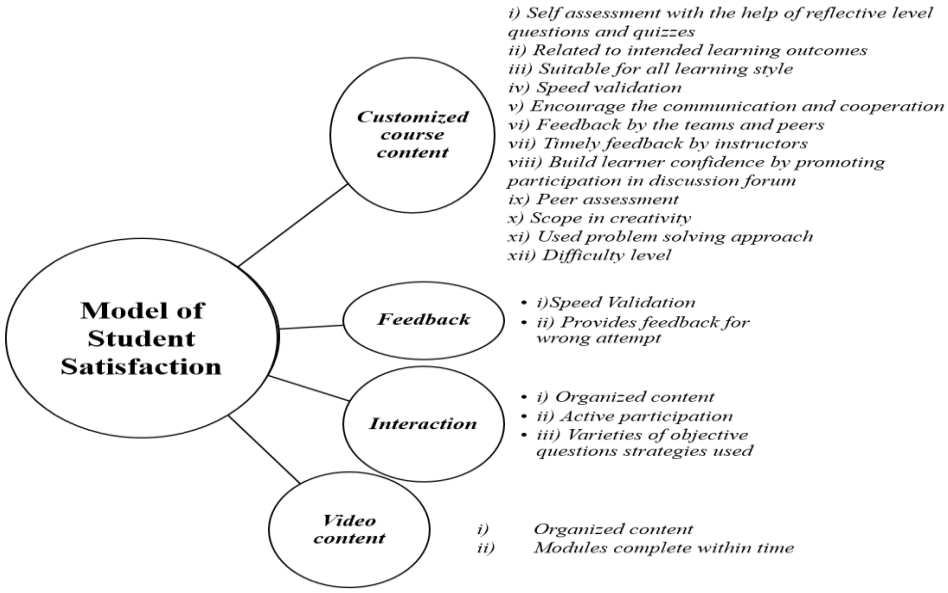


Table 4.4 Reliability Statistics of student satisfaction

Cronbach's Alpha	N of Items
.868	14

The above table is used for checking the reliability of the result of the item for the respective tool. In the case of reliability, we use Cronbach's alpha and the result showed 0.868, which is more than 0.75. It is showed the positive result of reliability. The developed tool will show the same result on the different samples of the same population.

Objective 2 To create a model of student engagement in MOOCs.

Table 4.5 KMO and Bartlett's Test of student engagement

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	**.887**	
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1696.102
	df	66
	Sig.	.000

The above table represents that the score of the KMO measure of sampling adequacy value of the 12 factors is 0.887, which is greater than 0.65 for student engagement in MOOCs. According to Field (2005), this value is acceptable and considered perfect. The KMO score is 0.88 to above and the interpretation of the score is good, indicating that principal component analysis can be carried out if the KMO measure of sampling adequacy is more than 0.65. Bartlett's test of sphericity is 0.000, which also shows a significant value of the factors and $p<.05$; thus, representative of the sample is suitable for principal component analysis (Malhotra & Dash, 2012). Here, the Chi-square is 1696.102 and the p-value of .000 implies a high probability of obtaining this result.

Table 4.6 Total Variance Explained of student engagement

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings				
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
SE1	6.326	52.715	52.715	6.326	52.715	52.715
SE2	1.049	8.741	61.455	1.049	8.741	61.455
SE3	.994	8.281	69.737			
SE4	.781	6.508	76.245			
SE5	.580	4.833	81.078			
SE6	.475	3.962	85.040			
SE7	.443	3.694	88.734			
SE8	.380	3.167	91.901			
SE9	.358	2.979	94.880			
SE10	.275	2.290	97.170			
SE11	.185	1.545	98.715			
SE12	.154	1.285	100.000			

Extraction Method: Principal Component Analysis.

Table 4.7 Component Matrix of student engagement

Statement	Components	
	Factor 1	**Factor 2**
SE1	.643	
SE2	.788	
SE3	.768	
SE4	.805	
SE5	.786	
SE6	.825	
SE7	.836	
SE8		-.598
SE9	.834	
SE10	.788	
SE11	.704	
SE12		.800

Extraction Method: Principal Component Analysis.

The above tables of Principal component analysis reveals that variables 1,2, 3,4,5,6,7,9,10, and 11 are grouped under component 1, and variables 8 and 12 are grouped under component 2. The primary objective of the principal component analysis is to investigate the effective dimension of student engagement in MOOCs. The data were analyzed through SPSS-22 to summarize the 12 variables of the questionnaire demonstrating the student engagement in MOOCs. The data were subjected to PCA, under exploratory component analysis. According to the cumulative percentage, 61.45% is good for measuring the validity of a tool and it shows that the validity of the

question refers to how accurately a method measures what is intended to measure. The majority of the variance creates in the first factor 52.71% variance of the total cumulative percentage which is 61.45%.

The table demonstrates that component (factor)1 represents the academic engagement based on student engagement where students are connected with different aspects, such as; time management for the massive open online courses, taking notes during classes, revisiting notes during the preparation of assessment, searching further information, inspired to expand knowledge, participate in the discussion forum. Component (factor)2 represents socio-emotional engagement based on student engagement where students are connected to share learning materials with others and the course is interesting. The researcher has taken a standardized tool for measuring student engagement, the scale named MOOC engagement scale (MES) developed by Deng et. al., (2020). It includes four dimensions of student engagement as discussed above. After checking the validity of the questionnaire, it shows that the tool needs to be restructured for use in the present context of the study. Therefore, according to the statistical results the factors merged and two factors appear to be useful predictors of student engagement.

Figure 4.3 Current Model of Student Engagement

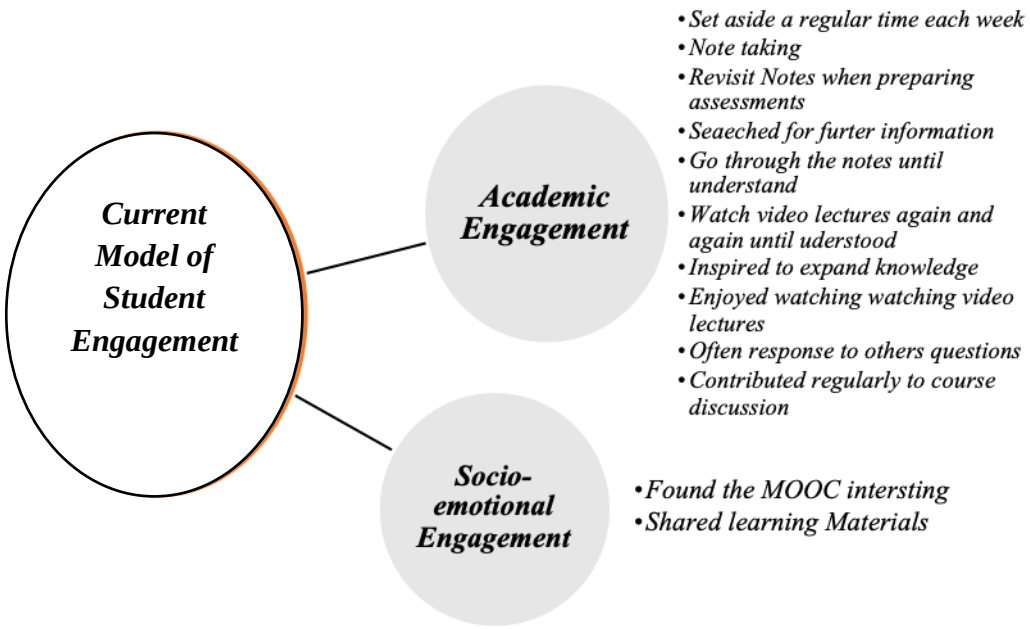


Table 4.8 Reliability of Student Engagement

Cronbach's Alpha	N of Items
.928	**10**

The above table is used for checking the reliability of the result of the item for the respective tool. In the case of reliability, we use Cronbach's alpha and the result showed 0.928, which is more than 0.75. It is showed the positive result of reliability. The developed tool will show the same result on the different samples of the same population.

Objective 3 To study the student satisfaction and student engagement in MOOCs with respect to their demographic details.

Ho3.1 There is no significant difference between male and female students with respect to their satisfaction in MOOCs.

Table 4.9 't' Table for student satisfaction on the basis of male and female

Gender	**N**	**Mean**	**SD**	**df**	**'t' Value**	**'p' Value**	**Remarks at 0.05 level**
Male	132	62.82	9.731	238	.645	.519	**Not Significant**
Female	103	61.98	10.433				

The above table shows that the computed 't' value is 0.645. Since, p=.519 which is basically showing p>0.05, that is greater than the significance level α= 0.05, then the Ho is failed to reject(Ghazal et al., 2018), and it can be believed that there is no significant difference between male and female students with respect to their satisfaction in MOOCs. The data shows that both the male and female teachers do not differ in their respective mean scores of student satisfaction. It means students are equally satisfied in MOOCs, whether male or female.

Ho3.2 There is no significant difference among students of different educational backgrounds with respect to their satisfaction in MOOCs.

Table 4.10 ANOVA Table for student satisfaction on the basis of educational background

Educational Background	**N**	**Source of Variation**	**Sum of squares**	**df**	**Mean square**	**'F' value**	**'p' value**
Pursuing UG	10	**Between Groups**	106.173	45	2.413	.976	.521
UG	16						
Pursuing PG	21	**Within Groups**	479.735	194	2.473		**Not Significant**
PG	73						
Pursuing PhD	48	**Total**	585.908				
M.Phil/PhD	66						
Professional Courses	6						

The above table shows that the output of the one-way ANOVA analysis. We can see that the significant value is 0.521 (i.e., p=.521), greater than the significant level of 0.05. Since p>0.05, that is the level of α= 0.05, then the Ho is failed to reject, and it can be believed that there is no significant difference among the educational backgrounds of students for their satisfaction in MOOCs. However, the calculated value of F is not significant in all categories (F=1.267). It means students are equally satisfied with MOOCs on the basis of their educational background.

Ho3.3 There is no significant difference between male and female students with respect to their engagement in MOOCs.

Table 4.11 ‘t’ Table for student engagement on the basis of male and female

Gender	N	Mean	SD	df	‘t’ Value	‘p’ Value	Remarks at 0.05 level
Male	132	62.82	9.731	238	.645	.519	**Not Significant**
Female	103	61.98	10.433				

The above table shows that the computed ‘t’ value is 0.645. Since, p=.519 which is basically showing p>0.05, that is greater than the significance level α= 0.05, then the Ho is failed to reject (Ghazal et al., 2018), and it can be believed that there is no significant difference between male and female students with respect to their engagement in MOOCs. The data shows that both the male and female students do not differ in their respective mean scores of student engagement (Al-Rabia et al., 2021). It means students are equally engaged in MOOCs, whether male or female.

Ho3.4 There is no significant difference among students of different educational backgrounds with respect to their engagement in MOOCs.

Table 4.12 ANOVA Table for student engagement on the basis of educational background

Educational Background	**N**	**Source of Variation**	**Sum of squares**	**df**	**Mean square**	**'F' value**	**'p' value**
Pursuing UG	10	**Between Groups**	93.432	32	125.744	1.267	.169
UG	16						
Pursuing PG	21	**Within Groups**	492.475	207	72.668		
PG	73						
Pursuing PhD	48	**Total**	585.908				**Not Significant**
M.Phil/PhD	66						
Professional Courses	6						

The above table shows that the output of the one-way ANOVA analysis. We can see that the significant value is 0.169 (i.e., p=.169), greater than the significant level of 0.05. Since p>0.05, that is the level of α= 0.05, then the Ho is failed to reject, and it can be believed that there is no significant difference among the educational backgrounds of students with respect to their engagement in MOOCs. However, the calculated value of F is not significant in all categories (F=1.267). It means students are equally engaged in MOOCs based on their educational background.

Objective 4 To study the relationship between student satisfaction and engagement in MOOCs.

Ho4 There is no significant relationship between student satisfaction and student engagement in MOOCs.

Table 4.13 Coefficient of correlation value between student satisfaction and engagement

		SS1	SE 3
SS1	**Pearson Correlation**	**1**	**.959****
	Sig. (2-tailed)		**.000**
	N	**414**	**414**
SE 2	**Pearson Correlation**	**.959****	**1**
	Sig. (2-tailed)	**.000**	
	N	**414**	**414**

Correlation is significant at the 0.01 level (2-tailed).

There is a significant relationship between student satisfaction and student engagement in Massive Open Online Courses. The value of the coefficient of correlation is 0.959, which shows the high correlation between student engagement and their satisfaction in MOOCs at 0.01 level. Pearson Correlation is used for calculating this relationship. The table shows students engage in MOOCs where they are satisfied after completing the courses in MOOCs.

The data were analyzed in the present chapter using a suitable statistical technique. In continuation of the statistical treatment applied over the data, meaningful interpretation

was derived from them to gain newer insight into the problem. The summary and detailed conclusions derived based on analysis are presented in the next chapter.

CHAPTER 5

MAIN FINDINGS, DISCUSSION, EDUCATIONAL IMPLICATIONS, AND SUGGESTIONS FOR FURTHER STUDIES

CHAPTER 5

MAIN FINDINGS, EDUCATIONAL IMPLICATIONS, AND SUGGESTIONS FOR FURTHER STUDIES

5.1 Introduction

The main objective of this present research was to find out student satisfaction and their engagement in MOOCs. For this purpose, the researcher collected data with the help of the questionnaire through an online survey. The results were analyzed and interpreted in chapter four. After data have been interpreted, the researcher writes a well-organized report of the present study.

5.2 Major Findings

The summary of the findings of the present study are as follows:

1) The four factors of student satisfaction show 56.23% of the total variance. The analysis of student satisfaction shows that 21 factors are considered to determine student satisfaction in the present study. Fourteen factors are identified as causing the maximum variation in student satisfaction. The final model shows four factors of student satisfaction- customized course content, feedback, interaction, video content, determine student satisfaction in MOOCs. The final model shows that the four factors are feasible to the study student satisfaction in the present context of study.

2) The two factors of student engagement show 61.45% of the total variance. The analysis of student engagement shows that 12 factors are considered to determine student engagement in the present study. Ten factors cause the maximum variation in student engagement. The final model shows that the two factors- academic

engagement and socio-emotional engagement, determine student engagement in MOOCs. The final model shows that the four factors are feasible to the study student engagement in the present cotext of study.

3) The results show that both the male and female students do not differ in their respective level of satisfaction in Massive Open Online Courses. The result is supported by several related literature (Ali et. al, 2016; Weerasinghe, 2017; Conole, 2014; Pelletier et al., 2016).

4) The results show that students from different educational backgrounds do not differ in their respective level of satisfaction in Massive Open Online Courses (Al-Azawei & Lundqvist, 2015; Ali et. al, 2016; Weerasinghe, 2017; Fredericksen et al., 2019).

5) The results show that both the male and female students do not differ in their respective levels of engagement in Massive Open Online Courses. It reflects that student get equal chances in different MOOCs platforms and can engage themselves properly in different disciplines (Pelletier et al., 2016; Kothiyal et al., 2013).

6) The results show that students from different educational backgrounds do not differ in their respective levels of engagement in Massive Open Online Courses(Rummler, 2017; Pathak & Mishra, 2021).

7) The results show a high positive correlation between student satisfaction and their engagement in massive open online courses (Kuo et al., 2013). It means that as students' engagement increases, an increase in student satisfaction also occurs (Hew et al., 2020). The high correlation is a significant finding of the study as a strong relationship between student engagement and their satisfaction suggests that the course

developer shall take robust steps for engaging the students in online courses to increase their satisfaction with courses.

5.3 Discussion of major findings

The discussions of the findings of the present study are as follows:

1. The present research presents a model of student satisfaction and has identified four factors in the new model of student satisfaction with MOOCs. These four factors are connected to student satisfaction with various characteristics of four quadrants of MOOCs such as e-tutorial, e-content, discussion forum, assessment. The four factors contributing to students' satisfaction in MOOCs (Kırmızı, 2014) are as follows: customized course content, feedback, interaction and video content. In the last ten years, the way we learn has changed dramatically. E-learning portals have made it possible for anybody to access educational materials regardless of their location. The teaching method has been streamlined and transformed as a result of it. Everyone can profit from e-learning, from students to workers. Customize course content takes this process one step further. It provides courses tailored to meet the specific needs of the learners. According to the present study, customized course content comprises of factors, such as suitability for all learning styles, speed validation for completing the course, self-assessment, building learner confidence, the scope of creativity, content for problem-solving approach, suitability of difficulty level for all students, specific customized course module, a suitable length of content. According to the related literature, (Howson & Matos, 2021; Kumar & Kumar, 2020; Marcia Anne, 2020; Hew et al., 2019; Sahni, 2019; Alqurashi, 2018; Tarigan, 2012) customized course content must have some important characteristics, such as content-specific learning which is

connected to the present educational aspects, intended learning outcomes, planned and organized contents, skill-oriented approaches, relevant in professional fields, used for career growth, provide sufficient data which improve their performance, fulfil the course-oriented needs of the students (Bradford, 2011). Customized course content based on sound pedagogy, good design principles, strong dissemination efforts, pedagogical principles of constructivism promotes interactive engagement in course (Hake, 1998), and content which is presented in segments of length that a typical user can pay the level best attention to, instead of long continuous unit is also significant for satisfaction of students with MOOCs. The factors are well connected to the four-quadrant approach in MOOCs. **Customized course content** factor plays an important role in student satisfaction in MOOCs. On the other hand, the second identifying factor was feedback and this factor focuses on self-assessment and feedback for the wrong attempts. Self-assessment refers to a comprehensive, systematic, and regular review of a particular programme's activities and results. It can help a student to decide whether students learning is going on the right track in terms of learning outcomes (Welch, 2020; Chitkushev et al., 2014). It does not have to be about the change the way of learning, rather it is about affirming what the student is already doing. **Feedback** is originally based on the information given to the student by peers and teachers about their performance relative to learning goals and outcomes. It will help them understand how well the student's performance on an assigned task or a particular assignment (Bauk et al., 2014). On the other side, the third identifying factor was **interaction** and this factor focuses on active participation and organized content. A student's active participation is a way of working that supports an individual's right to participate in the activities and relationships of everyday life as independently as possible (Bolliger & Wasilik, 2009). The individual is an active partner in their learning process and learns

through interaction with peers and teacher rather than remaining passive during learning. The fourth and last identifying factor is **Organized video content** and this factor focuses on organized, structured video content covering all the learning outcomes and completing the course module within time. These all come under video content. Video content is a self-study activity designed to achieve specific course learning outcomes. (Design principles for online tutorials, blog). They are usually delivered via the internet through recorded tutorials which means video or screenshots (Arbaugh, 2018), typically of a subject expert presenting information and ideas or giving demonstrations.

2. The researcher has developed a model of student engagement and has identified two factors in the new model. On the basis of the literature review, student engagement focuses on the four aspects and these are: behavioural, cognitive, emotional, and social. In the context of the present study, only two factors of student engagement contribute in engaging students in MOOCs and they are as follows: academic engagement and socio-emotional engagement. Keeping in view the significance of these two factors in the student engagement of Indian students' learning in MOOCs, the course coordinator must make attempts to promote both types of student engagement. The ten items connected to academic engagement are as follows: student's set aside regular time for each work, student's take notes and revisit notes while preparing the assignment, search further information, watch video lectures again and again, respond to other learners' questions, contribute regularly in course discussions. On the basis of the literature review (Chiu, 2021; Erdogdu & ÇAkıroğlu, 2021; Deng et al., 2020; Deng et al., 2019; Conole, 2016; Dixson, 2015) academic engagement refers to knowledge-related interaction, time on task, completion of work on time, engaging in different

activities, participation in different activities related to the particular course, pride which comes in the quality of work they produce, the student feels proud of accomplishments and invests in their individual learning outcome, proactivity must be there; which means some students are taking a real initiative in their learning. The factors of academic engagement cited in the literature are part of academic engagement proposed in the present study as well. Mentors should help students set their goals until they can assume a more proactive role in their learning process. The course coordinators must provide opportunities for students to seek out additional knowledge and learn more beyond what they teach them. Passion in learning plays a genuine joy and enthusiasm in the process of learning for the subject as well as activity. Students must have zest, be keen to learn more, and do more. It can be said that passion breeds passion and course coordinators, teachers, mentors are enthusiastic about teaching. Students will also feel the same in the process of learning. Students who are engaged in MOOCs will exhibit more patience for understanding the topics, for themselves or their peers (Hew, 2014). It is a general vibe of an engaged class of students. It is because if anyone enjoys something, they are more willing to endure any type of boredom or slow progress (Lan & Hew, 2020). Coordinators should have that kind of patience to teach the new concept of the learners, and students also grasp the topic very well. Coordinators, mentors, teachers must remind their students that understanding a new topic can take a large amount of time, so read the topic over and again. Students who are engaged in online classes will be focused and happily involved in the discussion forum, projects, assignments kinds of activities (Martin & Bolliger, 2018). Engage students always feel comfortable and relaxed in online courses, and this will make the level of understanding easier and more enjoyable than the others in whatever they are learning during sessions. The items of academic engagement presented in current

model are truly connected to these characteristics, such as; searched for further information when feel puzzle, going through the notes until understanding, watching video lecture again and again, and these are connected to patience and passion for learning. Participation is associated with regularly contributing to course discussion, often responding to other learners (Muthuprasad et al., 2021).

On the other hand, socio-emotional engagement is another factor of student engagement identified in the study and the literature finds that this type of engagement is based on self-awareness, self-management, social awareness, relationship skill, responsible decision making. On the basis of all these aspects, the researcher has named the second-factor socio-emotional engagement (Hoyt et al., 2020). It is because interesting course content and shared learning material with others come under the second factor. On the basis of related literature, the researcher found all these connected aspects and provide the two new factors in the current model.

3. The study attempted to find out student satisfaction and their engagement in MOOCs. According to the findings of the present study, it is found that there is no significant difference among students' satisfaction on the basis of their gender; such as male and female. It basically shows that student satisfaction is equal regarding the massive open online courses. MOOC is a field where students can learn from anywhere, anytime (Pelletier et al., 2016). The result of the study also tries to show that there are no demographic barriers for students whether the students belong to different categories of gender. They all can learn in any MOOC platform both collaboratively and cooperatively. There is no significant difference between males and females on the basis of their completion, participation rate. The percentage of satisfaction in various dimensions shown by males and females are as follows:

Table: 5.1 Percentage of Student Satisfaction on the basis of Male and Female

Five-point scale	E-tutorial		E-content		Discussion Forum		Assessment	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Strongly disagree	1.08%	1.5%	3.92%	3.91%	3.30%	4%	5.96%	5.41%
Disagree	3.08%	3.56%	8.8%	9.08%	5.47%	6.16%	5.93%	6.11%
Neither agree nor disagree	15.58%	16.41%	11.85%	13.08%	21.17%	22.33%	24.16%	24.55%
Agree	40.08%	41.08%	50.73%	51.08%	49.63%	48.15%	40.91%	39.77%
Strongly Agree	40.18%	37.45%	24.70%	22.85%	20.43%	19.36%	23.04%	24.16%

Research shows that there is no significant difference student satisfaction with respect to male and female in MOOCs. Moreover, the researcher has provided the table percentage of male and female students with respect to the four quadrant approaches in MOOCs. The statistics shows that there is no significant difference in satisfaction with respect to their gender in MOOCs which means they are equally satisfied in different

MOOCs. The researcher has taken total 240 samples and there are 132 males and 108 females participant for this research. According to UNESCO, there are some gender-based inequalities around the world, and these are mainly determined by geographical isolation, minority status, disability, early marriage, safety security, gender inequalities, and distance. But students can ignore all these biases and learn as well as develop their skills in different areas, mostly in the SWAYAM platform, like refresher courses, architecture and planning, humanities and arts, engineering and technology, law, management and commerce, maths, and sciences, teacher education with the help of MOOCs from any time and anywhere in the world (Ilgaz & Gülbahar, 2015). It is a platform where students can get life-long education because there is no age boundary based on gender. It is true that equal opportunity should be there in the education system (Ilgaz & Gülbahar, 2020a). Students and parents should be realized that the right to education without discrimination or exclusion is a fundamental principle of equality of opportunity in education, which is common to almost all international human rights treaties is given effect (Singh, 2015). Therefore, there are no such biases and equal opportunity in MOOCs on the ground of education, and my study also shows this.

4. It is found that there is no significant difference in the educational background among students based on their satisfaction. It mostly shows that student satisfaction based on education is equal for all levels. Students pursuing UG, UG, PG, PG, professional courses, and research levels are satisfied with Massive Open Online Courses taken for different purposes (Fredericksen et al., 2019). It is also showing that student satisfaction on the basis of four quadrants in MOOCs, which are e-tutorial, e-content, discussion forum, and assessment. According to their response, 41% of

students agreed that the content of the e-tutorial was organized, it covers all the learning outcomes (Tarigan, 2012), the instructor completed all modules within the time period, the speed validation of the e-tutorial was good. Students were satisfied with the self-assessment with the help of reflective level questions (Marcia Anne**,** 2020). 48% of students agreed with e-content based on content, learning outcomes, learning style, speed validation based on completion of the course, and students were satisfied with self-assessment with the help of reflective level questions. 46% of students agreed with the discussion forum based on active participation, encouraging communication and cooperation, feedback by their peers, course team, and instructors, and building learners' confidence (Yuqin Yin, 2016). 44% of students agreed with the assessment process in MOOCs based on providing feedback for the wrong attempts, a variety of objective questions strategies used throughout the course, scope of creativity, using a problem-solving approach, and the difficulty level of the project. There are fewer students who strongly disagreed with all these things (Yawson & Yamoah, 2020). The percentage of student dimension Only 1% for e-tutorial, 1.33% for e-content, 3% for discussion forum and 6% for assessment. So, it can be said that the students are satisfied with different programs as well as different platforms based on four-quadrant in MOOCs. Students are getting satisfactory support from various MOOCs based on their particular disciplines. It proves that the modules are innovative, objectives of the modules are fulfilling the purposes of the students, the learning outcomes are significant, standardized assessment process (Kumar and Kumar, 2020), in-depth knowledge of eminent professors, way of teaching, the pace of their learning, the flexibility of the learning process, useful contents and the organization of complete courses helping the students in a better version of themselves in the field of education. For that reason, the demand for MOOCs among students is increasing day by day

(Baldwin, 2017). The top three leading states are Tamil Nadu (25%), Andhra Pradesh (15%), and Maharashtra (11%) for student registration in SWAYAM (NPTEL Report, 2021).

5. It is found that there is no significant difference between student engagement based on gender. It shows that student engagement is equal regarding the massive open online courses. Student engagement cannot be observed, but it can be defined as a measure of student participation in the learning process. This mostly includes their interaction and cooperation with their peers and teachers. It is a multi-faced concept, such as behavioral, cognitive, emotional, and social. It mainly examined holistically rather than in isolation. Though e-tutorial, e-content, discussion forums, and assessment influence how students think, feel, and act completely (Lan & Hew, 2020). Student engagement is mostly based on their relevance with the course, active and authentic learning, autonomy, and technical competence. High attention, as well as high commitment, also play a very significant role. The researcher shows the active engagement of both the male (132) and female (108) students. The study showed four types of engagement and the different views of students based on these four types of engagement patterns. The percentage of engagement in various dimensions shown by males and females are as follows:

Table: 5.2 Percentage of Student Engagement on the basis of Male and Female

Five-point scale	Behavioural Engagement		Cognitive Engagement		Emotional Engagement		Social Engagement	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Strongly disagree	2.08%	2.5%	2.92%	2.91%	3.33%	3%	4.96%	5.41%
Disagree	2.08%	2.56%	8.8%	7.08%	5.41%	5.16%	5.83%	5.11%
Neither agree nor disagree	14.58%	14.41%	10.83%	9.08%	19.16%	20.33%	14.16%	14.96%
Agree	37.08%	36.08%	53.75%	52.08%	47.50%	48.15%	42.91%	41.16%
Strongly Agree	44.17%	44.45%	23.70%	28.85%	24.6%	23.36%	32.14%	33.36%

Research shows that there is no significant difference student engagement with respect to male and female in MOOCs. Moreover, the researcher has provided the table percentage of male and female students with respect to their level of engagement in MOOCs. Though there are a little difference in the level of percentage of their engagement level on the basis of particular four types of engagement but the statistics shows that there is no significant difference in engagement with respect to their gender in MOOCs which means they are equally engaged in different MOOCs. So, there is no bias between males and females based on their engagement. It is also a very good sign

in the field of education. The population I have taken for the study is based all over India. The researcher has taken total 240 samples and there are 132 males and 108 females' participant for this research. According to the National Statistical Office (NSO) report, the average literacy rate is 77.70% and the male literacy rate at the India level in 2021 stands at 84.70% & female literacy stands at 70.30%. According to the last census report, the male and female literacy rates were 82.14% and 65.46%. PRAGYATA Guideline for Digital education also talked about the different initiatives of online education and MOOCs are playing a very significant role in education sectors. SWAYAM is a national MOOC portal in India and NCERT has launched 34 online courses for students and teachers on the SWAYAM portal. NIOS offers 18 MOOCs at the secondary level and 20 courses at the senior secondary level. With the help of these initiatives, the dropout and stagnation rate will decrease in the level of higher education. Therefore, the Government is also trying to engage more students in education online. For students who are not comfortable with the English language, SWAYAM-NPTEL also plans to add the translation of 8 languages for them, like; Bengali, Gujrati, Hindi Kannada, Malayalam, Tamil, Telugu. SWAYAM-NPTEL invites a single point of contact (SPOC) from different heads of colleges from different states. It is also a great initiative of NPTEL for the students and more students can engage and complete their courses in MOOCs. Likewise, they can engage and fulfil their need with the help of the contents from different languages (Martin &Bolliger, 2018).

6. It is found that there is no significant difference in students' educational backgrounds based on their engagement. It mostly shows that the student engagement based on education is equal for all levels for those pursuing UG, UG, PG, PG, and research level,

engaged with Massive Open Online Courses. 44% of the students shows the behavioural engagement based on time management for MOOCs, taking notes from asynchronous courses, revise notes when preparing assessment tasks. 48% of students agreed to cognitive engagement based on searching further information when students get puzzles, going through the notes until understood, watch several video lectures again and again until understood (Roque-Hernández et al., 2021). 43% of students agreed to emotional engagement based on inspiration to expand knowledge, found MOOCs are interesting, and student enjoyed watching video lectures (Tarigan, 2012). 40% of students agreed to social engagement in MOOCs based on responding to other learners' questions, contributing regularly to course discussions, and sharing learning materials with others. Student engagement also enhances the collaborative and cooperative aspects within students and also students can connect with several peers who join these MOOCs globally. Our government is also trying to reach the Indian education system globally. It will improve the performance level of students. Group work also help students who have difficulty with social skill. MOOCs provide a safe and structured space to interact with others, and they will also help develop a higher level of thinking and increase student retention (Tontini & DagostinPicolo, 2013). Therefore, it proves that interactive e-content for all courses, high-quality teaching and learning experiences using multimedia on an anytime, anywhere basis, easy access of various disciplines, peer group interaction, a discussion forum to clarify doubts fulfil the students' requirements, knowledge upgradation, and they engage in the different discipline based on their necessities. The study is also showing this kind of result as well.

7. It is found that there is a high coefficient of correlation between student satisfaction and their engagement in MOOCs. It plays a very important role in education. Student satisfaction and engagement in education are connected to active learning. Students cannot get satisfied without engagement in learning and MOOCs are the platform where students across the globe can join and interact with enormous students through a single platform. For this, they must be highly motivated and get global information as well. On the other hand, students who have high motivation make an effort to be engaged properly in the field of education (Pelletier et al., 2016). Student satisfaction is a significant predictor of learning outcomes. The higher level of student engagement proves leads to higher level of student satisfaction (Gordon et al., 2009) and satisfaction comes when students actively engage in various learning activities in MOOCs, such as; customized course content, interaction, feedback, and video content, all are tended to get complete success. The characteristics of course components such as organized content, learning outcome, communication, creativity, build learner confidence, problem solving approach and completing the module are positively related to characteristics of student engagement such as note-taking, revisiting the notes, searching for further information, and students were highly engaged and satisfied with all these. On the other hand, responses to other questions contributed to regular ties for course discussions connected to a discussion forum (Sofroniou et al., 2020) where students get highly engaged and satisfied. Therefore, all these aspects prove that MOOCs provide the high-quality interactive e-contents, learning experience of using multimedia, easy access, monitoring, time limitation, a discussion forum to clarity doubts, delivery of the content, course structure, student interaction, instructions given by the coordinator are playing a very significant role behind student satisfaction and engagement. It further shows that students are academically engaged and also socio-

emotionally engaged as with the course with customized course content, active interaction, timely feedback, and organized video content fall the aspects of engagement and satisfaction are based on the researcher's dimensions for study. It shows extremely high correlations among all the four quadrants and the behavioural, cognitive, emotional, and social engagement (Meyer, 2014) which shows that designing a course with the features proposed by the model of the present study is a way towards engaging students in the course and thus ensuring their satisfaction with the course. In the present times of technology-driven education, the results of the study provide significant information to course coordinators to design the content in four quadrants by focusing on the characteristics proposed in the study as it is also related to engaging students with their learning in MOOCs.

5.4 Educational Implications

The teaching-learning process has undergone a tremendous shift in the 21st century. There is also a paradigm shift in the education system during the pandemic COVID-19. Several innovations have taken place towards making education student-centric. Presently, the learning system moves beyond the recall of various facts and focuses on developing 21st century skills such as problem-solving and creativity by providing opportunities for deeper engagement in the learning process (Brili, 2021). The traditional face to face method of learning has gradually shifted towards an online mode of learning and therefore, a new arena of research is needed to understand the online teaching-learning process for the promotion of student satisfaction and their engagement in MOOCs. Massive open online courses play a very important role in the process of online teaching-learning (Shah, 2018). So, in this connection, it becomes

desirable to take a study to investigate the student satisfaction and their engagement in MOOCs in higher education.

In an ever-changing world, global awareness and interconnectedness through the internationalization of higher education have an important role in shaping the next generation of learners. The National Education Policy, 2020 mainly envisions attaining the highest global standards in higher education quality. Information and Communication Technology (ICT) and the digital revolution have ushered in new possibilities in the process and delivery of the higher education system. With the higher expansion of ICT, it has touched virtually all dimensions of higher education and it has a major role to play in the internalization of higher education. ICT brings with it new educational opportunities along with flexibility in approach. Transformation with ICT's help is a motivation for higher education institutions to undertake several measures to revitalize the higher education system. NEP 2020 is mostly addressing the concerns for access to equity through MOOCs help. The creation of various e-content and offering online courses beyond physical boundaries. Moreover, the researcher recommended that the following steps be taken to increase student satisfaction and engagement in higher education in MOOCs. These are:

1) The use of MOOCs is essentially required to make the teaching-learning process more effective. Students can enhance their knowledge with the help of MOOCs from anywhere and anytime.

2) Higher education institutions should introduce local chapters for their students with the help of SWAYAM, India's national MOOC portal. There are almost total 3807 local chapters, state-wise and at the national and international level. It will help

students who cannot download and read the texts the course coordinator provides. There is basically a total of nine national coordinators in the SWAYAM portal.

3) Massive Open Online Courses is basically done by those students who are self-motivated, self-disciplined. So, every institute must have a mentor who will motivate them and guide the students to learn at their own pace and the mentors have to guide their students regarding the credit transfer and placement. It helps students engage in various MOOC courses as per their requirements. Those credit courses help students add that number in their particular semester. The mentor should also guide which universities accept these credit courses for their particular semester. These courses also help the student in the professional field and better carrier prospects.

4) Mentors should be aware of their students that NPTEL toppers can get opportunities to complete their internship with the top institute of India, like IIT Madras, Kharagpur, Bombay, Roorkee, Ropar, IISc Bangalore.

5) Higher education students should make a peer group and teachers must be facilitator only. A peer can help and motivate each other for engaging in different courses according to their needs. They can also check the evaluation process of each other, verify their progress chart, and compare their progress among themselves.

6) Teachers rather than mentors help to understand their students that there is an age boundary for these kinds of courses and they can use that certificate in their required professional field. However, MHRD and UGC have decided that an institution can only allow upto 20% of the total courses being offered in a particular programme in a semester through the online learning courses provided through the SWAYAM platform

(Projects CEC MOOCs). This credit transfer is mandatory from SWAYAM and NPTEL portal.

7) There are some typical learner engagements in a particular week, and mentors need to know their students. Such as- i) Watch the video lectures maximum 3 or 4 hours per week, ii) Test yourself (students) weekly assignment maximum 2 hours per week, iii) Notes, text, transcripts, references, live interaction maximum 1 hour per week, and iv) Participate in discussion forum at least 1 hour per week. So, it can be seen that maximum 8 hours should spend a student weekly in any MOOC courses.

8) Students should provide opportunities to educate themselves on new developments regularly with the help of these massive open online courses.

9) Moreover, students must be techno-savvy for adopting those massive open online courses. Otherwise, student satisfaction and their engagement won't be fruitful. The student is satisfied only when they engage in these kinds of courses properly. They can get this online learning essence when they only engage themselves in the technological environment.

10) Institutions must provide a technological environment for their students to engage themselves technologically.

5.5 Suggestions for Further Research

1) Similar study can also be conducted by taking a large sample, at least more than 500 samples and the researcher can check the variety of results accordingly.

2) The study can also be conducted based on urban and rural parts of India.

3) The study can also be conducted based on enrollment of the students in MOOCs related to first world countries like the UK, USA and the third world country, like India. It would be a comparative study.

4) The study can also be conducted based on the achievement level of the students in the professional field who would opt for the massive open online courses.

5) The study can also be conducted based on different states and the researcher can check the enrollment status in various MOOCs platforms.

6) The study can also be conducted on professional college students only.

7) The research can also be carried out on other variables such as motivation, attention, and interest.

8) The study can also be conducted to analyze the various challenges faced by the participants.

5.6 Conclusion

The present study analyzes the current model of student satisfaction and engagement on the basis of the proposed model which is basically showing the feasibility of the study. It helps to understand that the developed tool would show the same result on a different sample of the same population. This study also analyzes the student level of satisfaction on the basis of four-quadrant approaches and student engagement on the basis of behavioural, cognitive, emotional and social engagement (Deng et al., 2020) for their gender and educational background MOOCs. The satisfaction and engagement level of the participants from the MOOC run by SWAYAM, Canvas, FutureLearn, MOOKIT, MOODLE, and OpenLearn. The course content has the most significant impact on the

participants satisfaction and engagement level in MOOCs. It proves that students get the equal opportunity based on gender and educational background. The study also found the correlation between student satisfaction and their engagement in MOOCs. Finally, the research finds the factors that influence MOOC student satisfaction and engagement for learner preferences from various educational backgrounds, interactivity with course content, and performance-based on e-tutorial, e-content, discussion, assessment, behavioural and behavioural social engagement. So, the institution should take some responsibilities regarding student enrolment, motivate and encourage them regarding student engagement in higher education in massive open online courses (Raj & Aram, 2019).

In the present century, the method of learning has been shifted and it has become teacher-centric learning to learner-centric. It has been observing a paradigm shift in the education system for the last few decades and it has also transformed during pandemic COVID-19. The various platforms of MOOCs provided different types of courses where students can complete some particular disciplines very successfully. NPTEL, which is mostly controlled by the SWAYAM platform has rigorously worked on that for reaching and helping many students in India regarding access, equity and quality education. Eminent institutions have provided almost 2469 courses in the SWAYAM platform, and eminent professors teach on this platform. SWAYAM provided three types of courses: new, rerun, and repurposed. Students can join any course, anytime, according to their needs and they can also add several feathers in their academic arena. It can be said that MOOCs are considered a blessing in the teaching-learning process. But for those who are incompetent in using technology, faculties should help them and engage them in a technological environment. The related studies have found that

students face challenges in some aspects of student satisfaction related to course design, course content and many more. Based on the previous research findings, the researcher has come across different aspects of student satisfaction and engagement in higher education in MOOCs (Raj & Aram, 2019). The faster trends of massive open online courses are opted by so many students and this way of learning is spreading among the students' day by day. The national Indian MOOCs portal SWAYAM is getting very popular day by day and playing a very significant role.

SUMMARY

SUMMARY

Introduction

The era of twenty-first century is known as the century of science and technology. In the age of modernization, learners are deeply involved with various technologies. In the age of modernization, learners are deeply involved with various technologies. MOOCs, which stand for Massive Open Online Courses, are immensely changing how students learn more about it on the internet viz., online (education-blog). Under the mission of digital India, the government has taken several initiatives, and one of the most challenging and focus area is Massive Online Open Courses (MOOCs).

Satisfaction is based on fulfilling one's requirements and anticipation (Shiv & Huber, 2000). It is the judgment of a pleasurable level of consumption that is connected to the total fulfilment of a person's life. It is broadly accepted as a desirable of different experiences of products and services (Hossain, 2018). Student engagement is defined from the perspective of persistence, self-direction, sustained inquiry, playfulness with content, and unprompted transfer of understanding.

Yawson & Yamoah (2020) focused on understanding e-learning satisfaction in higher education from the perspective (Ghazal et al., 2018) of multi-generational cohort perspective and tried to understand the students' satisfaction with the help of the four components of their experiences. The mentors provide course design based on the details of the course outline, objectives of the course communicated, the tentative outcome of the learning shows the learners from the beginning, relevant and recent course content. The next dimension is course delivery which is based on the speaker's energy level and enthusiasm towards the topic, the sessions which are sequenced follow

the course outline, the appropriate presentation of the topics, the coverage of the whole content throughout the session, achieved the outcome of the learning. The third dimension is course interaction based on the electronic forums available for discussion in e-learning platforms, fair and proper respect for student's interaction availability of the coordinators. The fourth and last dimension is the course delivery environment based on internet availability and proper infrastructure maintenance. Kumar & Kumar (2020) focused on the learners, satisfaction from MOOCs through a mediation model. They also showed that the level of learners' satisfaction is based on the content of the course, delivery of the content materials which is based on uploading the contents on time, pace, delivery of the contents by the mentor, assessment of the course, and different aspects of supporting the course. They showed that the content delivery and assessment significantly connected to the overall satisfaction level of MOOCs. On the other hand, course support was also found to be significant with the learners' overall satisfaction. According to the structural model of satisfaction, the relationship between course content and overall satisfaction is mediated by the course assessment and the course support is not mediating the relationship between the course delivery and the overall satisfaction (Kumar & Kumar, 2020).

Baldwin (2017), showed in his study of acceptance and adaptation related to online course design. Researchers showed that the course design directly impacts students' satisfaction. This study is basically highlighting the significance of the clarity and vividness of course design, active participation in the discussion forum, and interaction with the instructor or mentor (Bradford, 2011; Paecher et al., 2010; Swan, 2001). The level of students' satisfaction has increased in online learning when instructors provide the proper feedback, communication is much more responsive, the instructional

resources are relevant and the authentic activities play a very important role in online courses (Blau et al., 2017; Lee et al., 2011). Course design also influences the perception of the students in online courses as well as the satisfaction and the quality of learning. An effective course design originally emphasises interaction and communication amongst the learners and mentors. The online courses take more responsibility and time of designing the course materials rather than the face-to-face mode of learning. The transaction of online courses provides instructors with a proper opportunity to consider alternative instruction and assessment (Shea et al., 2004). This study is based on grounded theory. He had taken four parameters on the basis of students' satisfaction. The first parameter is online course design strategies and some of the aspects come under this parameter. Course design plays a very important role in student satisfaction, and navigation plays a major role in online courses. The mentor always tries to design the courses in the online mode that are very easy to navigate to get learners in front of the content. Navigation helps students to get the sessions very easily. Easy to navigate courses help the students and the instructors and it also helps the students to find information as early as possible and the course runs with more flexibility according to the participants. Chunking or breaking the contents related to the modules helps the students navigate the online courses. It helps students to understand the content materials very easily. The second thing is eye contact which plays a very important role in online learning. The third parameter is interaction with the peers and instructors on the discussion forum, asking different questions, getting proper answers, active participation of each student is very important in online learning. The interaction basically provides a richer experience of learning for students. Online course design and the various teaching strategies help students interact on the particular course. Online education is more deliberate than face-to-face courses. The

participants can understand the value of designing relevant and authentic assignments for online courses that facilitate the interaction between the student and the content (Stickney et al., 2019). Moore (1989) also identified the importance of interaction between student-student, student-content, and student-instructor (Cho & Cho, 2017). The study focused on student reflection on asking questions to one another in a purposeful manner and helping the learner learn collaboratively. It fosters interaction, provides feedback, facilitates learning and the course design organization. They showed that communication in online learning plays a major role in online education, the same result found by Christensen and Osguthorpe (2004). Roblyer & Wiencke (2004) also showed that the successful interaction of online learning provides better results, good experiences, and the course design objectives fulfilled by this. Pate et al. (2009) suggested that instructors should help the learners communicate in a better way and help them respond thoughtfully. Clark (1994) showed that instructional design is essential and provides a better impact on student satisfaction. The fourth parameter is a social order based on the online course environment where they can connect properly with their peers and the instructor. The behaviour pattern is different in online learning with respect to the traditional mode of learning.

Significance of the Study

This study provides significant insight to those learners interested in joining this kind of MOOC and they also understand the (Kumar & Kumar, 2020) several engagement patterns; such as behavioral, social, emotional, and cognitive engagements of the learners. The behavioural engagement will help to understand the student involvement in MOOCs. This will help understand the students' participation in different types of academic activities and efforts to perform academic tasks. The cognitive engagement

will help to understand the integration and utilization of the student's skills, motivation, and strategies in their learning. The social engagement will help to understand the involvement of the students to the instructors and peers as well as their contribution in regular discussion. The emotional engagement will help to understand the level of self-motivation of the students and try to find out their inspiration for that particular course which they have already attended.

This study will help to understand the student satisfaction on the basis of four quadrants of MOOCs. The researcher will find out the perception of the students on the basis of the four quadrants approaches in MOOCs. The course coordinator will also understand how the students have been involved in different disciplines of MOOCs concerning four quadrants. Thus, the study will help to understand the various relations between student satisfaction and students' engagement in MOOCs. The researcher is trying to find out the aspects of those parts that play a significant role in student engagement and satisfaction. If the students do not engage with the courses, they cannot understand whether they are satisfied or not. This study is trying to know the student satisfaction and engagement from the different aspects because The Ministry of Education is planning to provide their courses through the India-based MOOC platform SWAYAM. It is an upcoming project of the Government of India. Moreover, it will help the course coordinator to understand the lacunas how they can engage a large number of students in various online courses in different MOOCs platforms. They can also understand which factor affects the students more related to their satisfaction and engagement in MOOCs (Rajabalee & Santally, 2020).

Research Gap

The perspective of the present study can be understood from the forty-two review of related literature review in the given chapter. After reviewing several research studies, the researcher came to enrich the thoughts and ideas in the related field of the study. That literature showed that in many cases, the user did not use various tools for their information seeking to its full extent. The studies reviewed in this chapter enable the researcher is going to conclude that:

i) Most studies are based on a single discipline and specific platforms.

ii) Most of the studies are based on satisfaction and engagement separately or had been examined together, but a lack of studies combines the two variables in MOOCs in the Indian context.

iii) There is no standard tool-related for measuring student satisfaction.

iv) Most of the studies focused on the issues related to course design and interaction between instructor, learners and contents.

Therefore, the researcher has decided to undertake the topic for his research on "A Study of Student Satisfaction and Student engagement in Massive Open Online Courses" and hence the investigator has taken this as a research problem for the present study. The researcher applied the descriptive survey method and convenient sampling for selecting the sample. The researcher hoped that the study would prove to be a valuable contribution to the research field in the context of MOOCs.

Statement of the Problem

MOOCs are student-centric because any number of students can study at a single time. MOOCs have become a famous avenue for diverse learners to upgrade their knowledge and skills. However, sometimes we see that the rate of students' course completion is very low upto only 15%. There are various reasons behind it, such as, sometimes they want to explore and try to get experience on the MOOC platform and therefore, do not complete the course. The present research aims to study student satisfaction regarding the four quadrants of MOOCs with respect to their engagement with MOOCs. Hence, the problem of the present study entitled "A study of Students Satisfaction and Student Engagement in Massive Open Online Courses".

Operational Definitions of key terms

The operational definitions of the variables of the study are as follows:

I. **Student Engagement:** The students' engagement talks about what a student brings in the field of MOOCs in terms of behavioural, cognitive, emotional, and social engagement. It is because engagement plays a very important role in every work. Self-interest must be there; otherwise, it won't be fruitful (Lan & Hew, 2020).

II. **Behavioral Engagement:** It is a type of engagement where students involve in massive open online courses from the aspect of time-management, note-taking, and making for the assignment as well as projects, and also revise notes when preparing assessment tasks.

III. **Cognitive Engagement:** In the present study, it refers to up-gradation of knowledge, incorporating data, skill development in the process of learning, and various ranges of memorization to use self-regulated strategies to promote students' understanding.

IV. **Emotional engagement:** It mostly refers to students' feelings or emotions towards MOOCs. It reflects the student's inspiration to expand their knowledge, interest in various courses, and enjoy watching video lectures.

V. **Social engagement:** It refers to the interaction among diverse students and with their course coordinator as well.

VI. **Student satisfaction:** It is based on fulfilling their requirements and expectation in various MOOCs. In the present study, students' satisfaction considers satisfaction with the four-quadrant of MOOCs with respect to their characteristics. These are described as follows:

VII. **E-tutorial:** It describes satisfaction with e -tutorial in relation to organized content, covers all the learning outcomes, completion of the modules within the prescribed time and the self-assessment based on reflective level questions.

VIII. **E-content:** The e-content plays a very crucial role in the process of online learning in MOOCs. Satisfaction with e-content is considered in the context of organized content, content related to intended learning outcomes, suitable for all learners, the completion of the modules within time, and the self-assessment based on reflective level questions.

IX. **Discussion Forum:** A discussion forum is mostly utilised by the course organiser or his team to raise questions and explain them in near real-time. This quadrant has been explored extensively in the context of student satisfaction in MOOC platforms' discussion forums.

X. **Assessment:** Assessment, the fourth quadrant of MOOCs, is a vital component of online learning and plays a major part in the learning process.

XI. **Student:** A student who has successfully completed at least one MOOC on any platform is considered as a student.

Objectives of the study

i) To create a model of student satisfaction in MOOCs.

ii) To create a model of student engagement in MOOCs.

iii) To study the student satisfaction and student engagement in MOOCs with respect to their demographic details.

iv) To study the relationship between student satisfaction and student engagement in MOOCs.

Hypotheses of the Study

The hypotheses formulated based on objectives are as follows:

i) There is no significant difference between male and female students with respect to their satisfaction in MOOCs.

ii) There is no significant difference among students of different educational backgrounds with respect to their satisfaction in MOOCs.

iii) There is no significant difference between male and female students with respect to their engagement in MOOCs.

iv) There is no significant difference among students of different educational backgrounds with respect to their engagement in MOOCs.

v) There is no significant relationship between student satisfaction and student engagement in MOOCs.

Methods Adopted of the Study

The Descriptive survey method is chosen in the present study as it is the best method to answer three types of questions addressed in the present study- descriptive questions, relationship questions, and predictive questions. The data was gathered through an online survey as it is considered best by the researcher for the need of the study.

Population of the Study

The population may be defined as the group of individuals belonging to the same species. For the present study, the population is the learner of MOOCs from all over India who have successfully completed at least one course in any MOOC on various MOOC platforms were included in the population of the study.

Sample of the Study

The present research, the researcher has used the convenient sampling method which comes under the non-probability sampling method. The researcher uses this sampling to collect data of the students in MOOCs because the sample is taken from a group of people whose data is accessible in consideration of the research limitations. The

researcher has taken those students from all over India who have already completed one or more than one MOOC.

First, the researcher contacted 7 course coordinators whose MOOCs are offered on different online platforms. The 4 MOOC course coordinators responded and agreed to participate in the study. The researcher shared the questionnaire with the course coordinators for further sharing with the participants in MOOCs.

The researcher received data from 415 MOOC participants from different platforms of MOOCs out of which only 240 participants who completed at least one MOOC are selected. Out of 240 participants, 132 males and 108 females from different age groups and different educational backgrounds constitute the final sample.

Tools for Data Collection

The researcher developed a self-constructed questionnaire to collect the required information from the study of sample. The tool of student satisfaction, a study variable, has been developed based on available literature and is designed according to the study's objectives. The researcher prepared a questionnaire entitled "Students Satisfaction in MOOCs" for the present study. The tool contains all four quadrants in MOOCs, such as e-tutorial, e-content, discussion forum, assessment, and overall satisfaction/instructional design as suggested by related literature. The researcher discussed with the specialists of the field and his research supervisor. The detailed process of construction of the questionnaire is discussed below. On the other hand, the researcher will adopt a tool for student engagement, another variable. Deng et al., 2020 developed a tool on student engagement in MOOCs. They developed a scale named

MOOC engagement scale (MES) (Deng et al., 2020) for full academic and research purposes.

Administration

The tools were administered to the students in MOOCs who have completed at least one course in MOOCs. The researcher sent three reminders for seeking cooperation in completing the questionnaire. Finally, it took 50 days to collect data from the respondents, and in the end, the researcher got 240 filled-up questionnaires from respondents.

Variables of the study

The researcher has adopted these two variables- student satisfaction and Students' engagement. The researcher has adopted the following demographical variables for the present study to do the analysis. Such as gender (male and female), and educational background (pursuing UG, UG, pursuing PG, PG, pursuing Ph.D., M.Phil/ Ph.D.,professional courses).

Statistical Techniques

In the present study, the researcher used Pearson's coefficient of correlation, mean, standard deviation, student 't'-test, ANOVA, and principal component analysis (PCA) for data interpretation and analysis with the help of SPSS statistical software and Microsoft Excel 2007.

Major Findings

The summary of the findings of the present study are as follows:

1) The four factors of student satisfaction show 56.23% of the total variance. The analysis of student satisfaction shows that 21 factors are considered to determine student satisfaction in the present study. Fourteen factors are identified as causing the maximum variation in student satisfaction. The final model shows four factors of student satisfaction- customized course content, feedback, interaction, video content, determine student satisfaction in MOOCs. The final model shows that the four factors are feasible to the study student satisfaction in the present context of study.

2) The two factors of student engagement show 61.45% of the total variance. The analysis of student engagement shows that 12 factors are considered to determine student engagement in the present study. Ten factors cause the maximum variation in student engagement. The final model shows that the two factors- academic engagement and socio-emotional engagement, determine student engagement in MOOCs. The final model shows that the four factors are feasible to the study student engagement in the present context of study.

3) The results show that both the male and female students do not differ in their respective level of satisfaction in Massive Open Online Courses. The result is supported by several related literature (Ali et. al, 2016; Weerasinghe, 2017; Conole, 2014; Pelletier et al., 2016).

4) The results show that students from different educational backgrounds do not differ in their respective level of satisfaction in Massive Open Online Courses

(Al-Azawei & Lundqvist, 2015; Ali et. al, 2016; Weerasinghe, 2017; Fredericksen et al., 2019).

5) The results show that both the male and female students do not differ in their respective levels of engagement in Massive Open Online Courses. It reflects that student get equal chances in different MOOCs platforms and can engage themselves properly in different disciplines (Pelletier et al., 2016; Kothiyal et al., 2013).

6) The results show that students from different educational backgrounds do not differ in their respective levels of engagement in Massive Open Online Courses (Rummler, 2017; Pathak & Mishra, 2021).

7) The results show a high positive correlation between student satisfaction and their engagement in massive open online courses (Kuo et al., 2013). It means that as students' engagement increases, an increase in student satisfaction also occurs (Hew et al., 2020). The high correlation is a significant finding of the study as a strong relationship between student engagement and their satisfaction suggests that the course developer shall take robust steps for engaging the students in online courses to increase their satisfaction with courses.

Discussion of major findings

The discussions of the findings of the present study are as follows:

1) The present research presents a model of student satisfaction and has identified four factors in the new model of student satisfaction with MOOCs. These four factors are connected to student satisfaction with various characteristics of four

quadrants of MOOCs such as e-tutorial, e-content, discussion forum, assessment. The four factors contributing to student's satisfaction in MOOCs (Kırmızı, 2014) are as follows: customized course content, feedback, interaction and video content.

2) The researcher has developed a model of student engagement and has identified two factors in the new model. On the basis of the literature review, student engagement focuses on the four aspects and these are: behavioural, cognitive, emotional, and social. In the context of the present study, only two factors of student engagement contribute in engaging students in MOOCs and they are as follows: academic engagement and socio-emotional engagement.

3) The study attempted to find out student satisfaction and their engagement in MOOCs. According to the findings of the present study, it is found that there is no significant difference among students' satisfaction on the basis of their gender; such as male and female. It basically shows that student satisfaction is equal regarding the massive open online courses. MOOC is a field where students can learn from anywhere, anytime (Pelletier et al., 2016). The result of the study also tries to show that there are no demographic barriers for students whether the students belong to different categories of gender. They all can learn in any MOOC platform both collaboratively and cooperatively. There is no significant difference between males and females on the basis of their completion, participation rate.

4) It is found that there is no significant difference in the educational background among students based on their satisfaction. It mostly shows that student

satisfaction based on education is equal for all levels. Students pursuing UG, UG, PG, PG, professional courses, and research levels are satisfied with Massive Open Online Courses taken for different purposes (Fredericksen et al., 2019). It is also showing that student satisfaction on the basis of four quadrants in MOOCs, which are e-tutorial, e-content, discussion forum, and assessment. According to their response, 41% of students agreed that the content of the e-tutorial was organized, it covers all the learning outcomes (Tarigan, 2012), the instructor completed all modules within the time period, the speed validation of the e-tutorial was good. Students were satisfied with the self-assessment with the help of reflective level questions (Marcia Anne**,** 2020).

5) It is found that there is no significant difference between student engagement based on gender. It shows that student engagement is equal regarding the massive open online courses. Student engagement cannot be observed, but it can be defined as a measure of student participation in the learning process. This mostly includes their interaction and cooperation with their peers and teachers. It is a multi-faced concept, such as behavioral, cognitive, emotional, and social. It mainly examined holistically rather than in isolation. Though e-tutorial, e-content, discussion forums, and assessment influence how students think, feel, and act completely (Lan & Hew, 2020). Student engagement is mostly based on their relevance with the course, active and authentic learning, autonomy, and technical competence. High attention, as well as high commitment, also play a very significant role.

6) It is found that there is no significant difference in students' educational backgrounds based on their engagement. It mostly shows that the student

engagement based on education is equal for all levels for those pursuing UG, UG, PG, PG, and research level, engaged with Massive Open Online Courses. 44% of the students shows the behavioural engagement based on time management for MOOCs, taking notes from asynchronous courses, revise notes when preparing assessment tasks.

7) It is found that there is a high coefficient of correlation between student satisfaction and their engagement in MOOCs. It plays a very important role in education. Student satisfaction and engagement in education are connected to active learning. Students cannot get satisfied without engagement in learning and MOOCs are the platform where students across the globe can join and interact with enormous students through a single platform. For this, they must be highly motivated and get global information as well. On the other hand, students who have high motivation make an effort to be engaged properly in the field of education (Pelletier et al., 2016). Student satisfaction is a significant predictor of learning outcomes. The higher level of student engagement proves leads to higher level of student satisfaction (Gordon et al., 2009) and satisfaction comes when students actively engage in various learning activities in MOOCs.

Educational Implications

1) The use of MOOCs is essentially required to make the teaching-learning process more effective. Students can enhance their knowledge with the help of MOOCs from anywhere and anytime.

2) Higher education institutions should introduce local chapters for their students with the help of SWAYAM, India's national MOOC portal. There are almost total 3807 local chapters, state-wise and at the national and international level. It will help students who cannot download and read the texts the course coordinator provides. There is basically a total of nine national coordinators in the SWAYAM portal.

3) Massive Open Online Courses is basically done by those students who are self-motivated, self-disciplined. So, every institute must have a mentor who will motivate them and guide the students to learn at their own pace and the mentors have to guide their students regarding the credit transfer and placement. It helps students engage in various MOOC courses as per their requirements. Those credit courses help students add that number in their particular semester. The mentor should also guide which universities accept these credit courses for their particular semester. These courses also help the student in the professional field and better carrier prospects.

4) Mentors should be aware of their students that NPTEL toppers can get opportunities to complete their internship with the top institute of India, like IIT Madras, Kharagpur, Bombay, Roorkee, Ropar, IISc Bangalore.

5) Higher education students should make a peer group and teachers must be facilitator only. A peer can help and motivate each other for engaging in different courses according to their needs. They can also check the evaluation process of each other, verify their progress chart, and compare their progress among themselves.

6) Teachers rather than mentors help to understand their students that there is an age boundary for these kinds of courses and they can use that certificate in their required professional field. However, MHRD and UGC have decided that an institution can only allow upto 20% of the total courses being offered in a particular programme in a semester through the online learning courses provided through the SWAYAM platform (Projects CEC MOOCs). This credit transfer is mandatory from SWAYAM and NPTEL portal.

7) There are some typical learner engagements in a particular week, and mentors need to know their students. Such as- i) Watch the video lectures maximum 3 or 4 hours per week, ii) Test yourself (students) weekly assignment maximum 2 hours per week, iii) Notes, text, transcripts, references, live interaction maximum 1 hour per week, and iv) Participate in discussion forum at least 1 hour per week. So, it can be seen that maximum 8 hours should spend a student weekly in any MOOC courses.

8) Students should provide opportunities to educate themselves on new developments regularly with the help of these massive open online courses.

9) Moreover, students must be techno-savvy for adopting those massive open online courses. Otherwise, student satisfaction and their engagement won't be fruitful. The student is satisfied only when they engage in these kinds of courses properly. They can get this online learning essence when they only engage themselves in the technological environment.

10) Institutions must provide a technological environment for their students to engage themselves technologically.

Suggestions for Further Research

1) Similar study can also be conducted by taking a large sample, at least more than 500 samples and the researcher can check the variety of results accordingly.

2) The study can also be conducted based on urban and rural parts of India.

3) The study can also be conducted based on enrollment of the students in MOOCs related to first world countries like the UK, USA and the third world country, like India. It would be a comparative study.

4) The study can also be conducted based on the achievement level of the students in the professional field who would opt for the massive open online courses.

5) The study can also be conducted based on different states and the researcher can check the enrollment status in various MOOCs platforms.

6) The study can also be conducted on professional college students only.

7) The research can also be carried out on other variables such as motivation, attention, and interest.

8) The study can also be conducted to analyze the various challenges faced by the participants.

Delimitations of the Study

The study is delimited in the following way:

1) The study is delimited to those students who have completed at least one MOOC course are excluded from the research.

2) The study is delimited to only two variables- Student's Satisfaction, Student's Engagement.

3) The study is delimited to massive open online course offered in India.

Conclusion

The present study analyzes the current model of student satisfaction and engagement on the basis of proposed model which is basically showing the feasibility of the study. It helps to understand that the developed tool would show the same result on different sample of the same population. This study also analyzes the student level of satisfaction on the basis of four quadrant approaches and student engagement on the basis of behavioural, cognitive, emotional and social engagement (Deng et al., 2020) for their gender and educational background MOOCs. The satisfaction and engagement level of the participants from the MOOC run by SWAYAM, Canvas, FutureLearn, MOOKIT, MOODLE, and OpenLearn. The course content has the most significant impact on the participants satisfaction and engagement level in MOOCs. It proves that students get the equal opportunity based on gender and educational background. The study also found the correlation between student satisfaction and their engagement in MOOCs. Finally, the research finds the factors that influence MOOC student satisfaction and engagement for learner preferences from various educational backgrounds, interactivity with course content, and performance-based on e-tutorial, e-content, discussion, assessment, behavioural and behavioural social engagement. So, the institution should take some responsibilities regarding student enrolment, motivate and encourage them regarding student engagement in higher education in massive open online courses.

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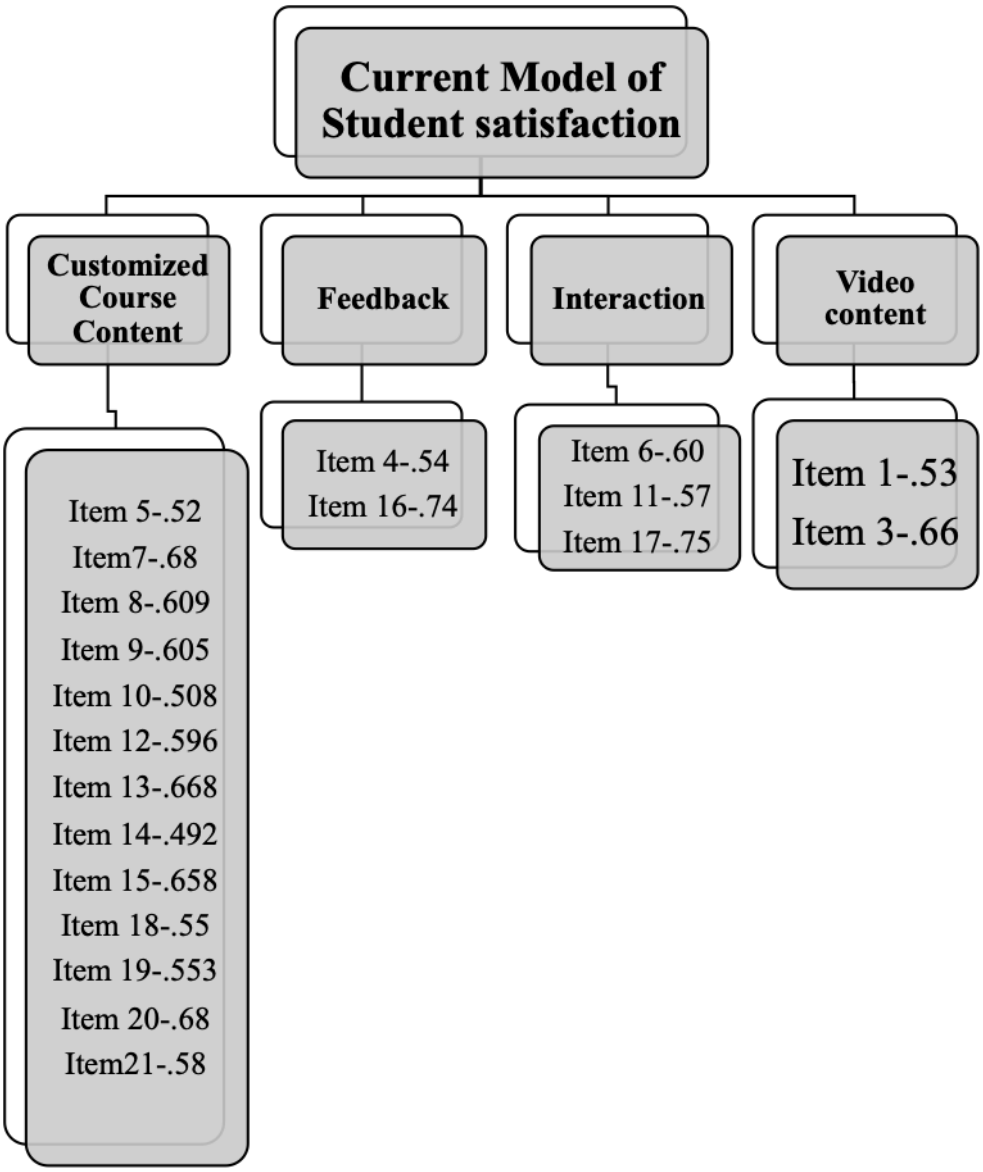
APPENDICES

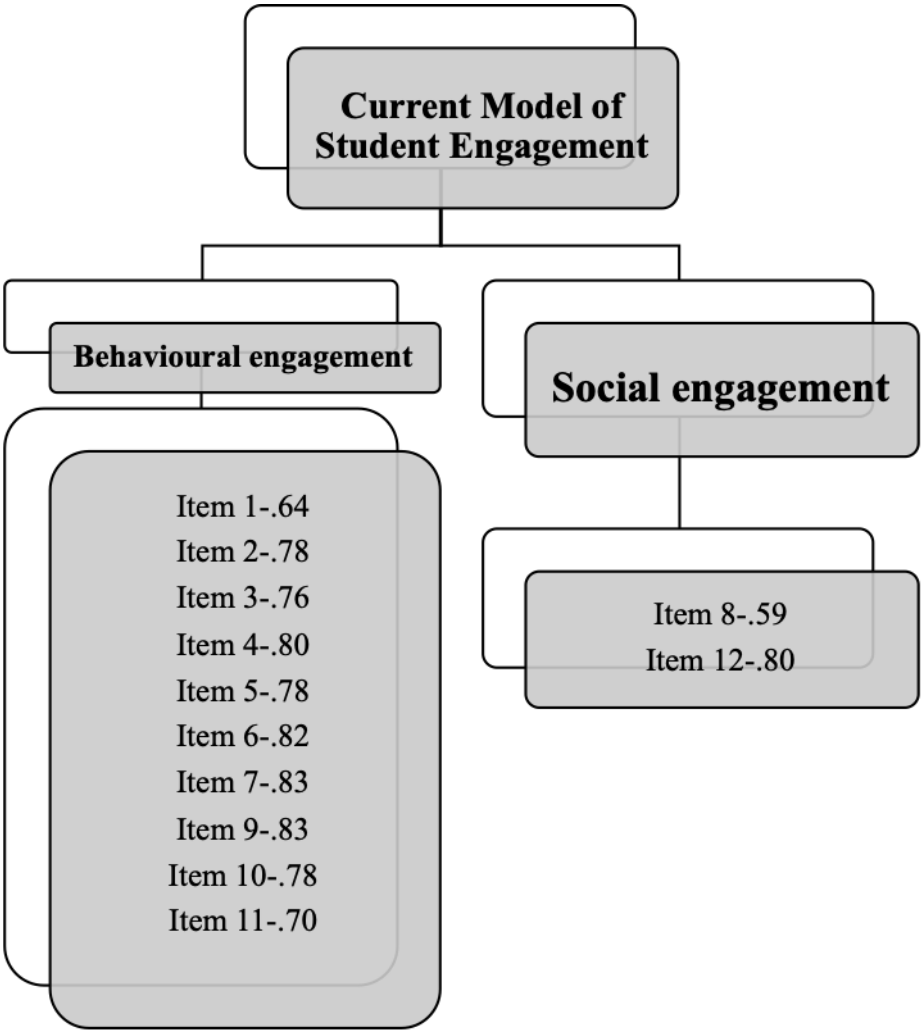
Appendix A

Current Model of Student satisfaction



Appendix B

Current Model of Student Engagement



Appendix C

SECTION-I

Researcher	Supervisor
Sanchaita Nath	Dr. Aarti Yadav
M.Phil. Scholar	Assistant Professor
School of Education	School of Education
Central University of Haryana	Central University of Haryana

QUESTIONNAIRE FOR STUDENTS' VIEWS IN MOOCs REGARDING STUDENTS' SATISFACTION AND ENGAGEMENT

This questionnaire is developed by Sanchaita Nath, Research Scholar, School of Education, central University of Haryana under the supervision of Dr. Aarti Yadav, Assistant Professor, School of Education, Central University of Haryana. Topic of Research: "A STUDY OF STUDENTS SATISFACTION AND STUDENTS' ENGAGEMENT IN MASSIVE OPEN ONLINE COURSES".

It will take not more than ten minutes to complete the form. Kindly share your experiences and opinion on the use and spread of online learning through MOOC, especially in the present scenario. I assure complete privacy of the opinion and views expressed by you and will be used only for research purposes.

Kind regards,

Sanchaita Nath

Appendix D

SECTION-II

Demographic Details

[Fill in (✓) Tick mark appropriately]

- ✓ Email
- ✓ Have you completed any course in MOOCs (Massive Open Online Courses)?

  □ Yes □ No

Demographic Details (Please provide answers accordingly)

- ✓ Name (Not mandatory)
- ✓ Contact No: (You are requested to provide your contact no. for further conducting personal interview regarding your experience related to MOOCs.) (Not mandatory)
- ✓ Gender: Female □ Male □ Transgender□
- ✓ Age Group (in years): Below 20□ 20-29□ 30-39□ 40-49□ 50 & above□
- ✓ State
- ✓ Marital Status: Unmarried□ Married□
- ✓ Educational Background (Tick mark on the suitable option)

  □Diploma/ Vocational training

  □Bachelor degree or equivalent

□Pursuing bachelors

□Master degree or equivalent

□Pursuing masters

□M.Phil. / Ph.D.

□Pursuing PhD

□Professional courses

- ✓ Mention the education background not covered in the above list: ……
- ✓ Name of the online course you have enrolled for: ……
- ✓ Duration of the course (in weeks)

□4

□6

□8

□12

□15

□16

□24

- ✓ Credit of the course

□1 credit

□2 credits

□3 credits

□4 credits

□More than 4 credits

- ✓ The course I took up belong to the Broad category of
- ➢ K-12 education school
- ➢ Higher education
- ➢ Life-long learning
- ➢ Skill development
- ➢ Career professional development
- ➢ Mention the broad category not covered in the above list:
- ✓ The course was offered on: Choose the suitable option

SWAYAM

MOOKIT

MOODLE

Canvas

Openlearn

Gnomio

- ✓ Mention any other platform has not been covered in the given list:
- ✓ How many courses have you completed? Tick mark on the following options:

One

Two

Three

Four

More than four

- ✓ Are you currently pursuing any course?

□Yes □No

Appendix E

SECTION-III

(Draft Version of the questionnaire of student satisfaction)

Dimension 1: E-tutorial

- Which of the following types of e-tutorials were used in the course? Please mark your response.

1	Video contents	Yes	No
2	Audio contents	Yes	No
3	Animation	Yes	No
4	Simulation	Yes	No
5	Transcript of videos	Yes	No
6	Virtual Lab	Yes	No
7	Video demonstration	Yes	No
8	Any other		

- **Please indicate your level of Satisfaction with given aspects of e-tutorial:**

Dimensions	**Strongly Agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
The content of e-tutorial is organized and structured					
The content of e-tutorial is rich and informative					

The presentation style of the e-tutorial is interactive					
The speed variation of e-tutorial is suitable to my needs.					
The e-tutorials are well designed to achieve the learning outcomes of course					

Dimension 2: E-content:

- Which of the following types of e-contents were used in the course? Please mark your response.

1	e-Books	Yes	No
2	Illustrations	Yes	No
3	Case studies	Yes	No
4	Presentations	Yes	No
5	Web Resources such as further references	Yes	No
6	Related Links	Yes	No
7	OER contents	Yes	No
8	Research papers & journals	Yes	No
9	Video	Yes	No
10	Anecdotal information	Yes	No

11	Historical development of the subject	Yes	No
12	Articles	Yes	No
13	Any other……		

- Please indicate your level of Satisfaction with each aspect of e-content:

Dimensions	**Strongly Agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
The e-contents are designed to achieve the learning objectives					
The e-contents provide up-to-date information					
The e-contents are suitable to the learning style of students					
The e-contents are clearly structured and organized					
The e-contents are adequate to support learning					

The e-contents are easy to understand					
The e-contents could be completed in assigned time duration					
The e-contents easily accessible					

Dimension 3: Discussion forum

- Which of the following types of e-contents were used in the course? Please mark your response.

Discussion forum are used for clarification of doubts and holding discussions for deeper understanding. It can be informed of forums provided on one LMS or conducting timely synchronous and asynchronous sessions of the students.

Which modes of discussion was used in course?

1	Only discussion forum	Yes	No
2	Only asynchronous	Yes	No
3	Only synchronous	Yes	No
4	The combinations of synchronous, asynchronous and discussion	Yes	No
5	Any other		

❖ Please indicate your level of satisfaction with each aspect of discussion forum:

Dimensions	**Strongly Agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
Active participation by majority of students in discussion forum					
Encourages the communication and cooperation among learners in the discussion forum					
Well moderated discussion by course team					
Feedback by peers is provided on discussion forum					
Feedback by course team provided on discussion forum					
Discussions are helpful in building understanding					

Dimension 4: Assessment

- Which of the following type of assessments were used?

1	Multiple Choice Questions	Yes	No
2	Fill in the blanks	Yes	No
3	Matching Questions	Yes	No
4	Short Answer Questions	Yes	No
5	Long Answer Questions	Yes	No
6	Quizzes	Yes	No
7	Assignments and solutions	Yes	No
8	Discussion forum topics and setting up the FAQs	Yes	No
9	Clarifications on general misconceptions	Yes	No
10	Making questions	Yes	No
11	Use of rubrics	Yes	No
12	Peer assessment	Yes	No
13	Projects	Yes	No

- Please indicate your level of Satisfaction with each aspect of assessment:

Dimensions	**Strongly Agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
The assessments are effective for measuring learning outcomes of courses					
Correct solutions were					

provided after attempting the test					
Multiple methods were used for assessment					
Use of peer assessment					
Assignments are based on higher level of understanding					
Use of creativity in assessment					
Use of problem-solving approach for assessment					
Difficulty level is manageable for assessment					

Dimension 5: Overall course quality

1) Satisfaction of instructional design

- Course content
- Teaching methods and design
- Evaluation and assessment
- Interaction and discussion forum

2) **Degree of Freedom**

- Submission of assignments beyond due date

- Access to course after course end
- Freedom to download and use the content
- Freedom to complete the course beyond the given time limit
- Access to course platform

4) **Degree of openness**

- The course is not biased towards the diversity in learners related to ethnicity, culture, profession or educational status
- E-tutorial and E-content are provided as open education resources under CC license
- Cost-effective/Monetary affordability
- No age restriction
- Not restricted to particular discipline
- Courses were offered by multiple language

5) **Degree of connectivity or interactivity**

- The learners are provided the opportunities for the cooperation as well as collaboration throughout the course
- Course Instructor is easily approachable
- Technical team is easily approachable to provide technical support

Appendix F

SECTION-III

(Final Version of the questionnaire of Student satisfaction)

Dimension 1: E-tutorial. Which of the following types of e-tutorials were used in the course? You can tick mark more than one component of e-tutorial.

E-tutorial	Yes	No
Video contents		
Audio contents		
Animation		
Virtual Lab		
Transcript of videos		

- ✓ Mention any other type of e-tutorial used in the online course
- ✓ Which type of e-tutorial do you like the most?
- ✓ Please indicate Satisfaction with given aspects of e-tutorial. The researcher has provided some statements given below and you have to identify the right option.

Dimensions	**Strongly Agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
The content of e-tutorial is well organized					
The e-tutorials cover all learning outcomes					
The speed at which the video					

of the e-tutorial is delivered matches the student pace of learning					
The e-tutorials can be completed within the allotted time period					
E-tutorial provides self-assessment with the help of reflective level questions or quizzes					

- ✓ **Dimension:2. E-content.** Which of the following types of e-contents were used in the course? You can tick mark more than one component of e-contents.

E-contents	**Yes**	**No**
e-Books		
Illustrations		
Case studies		
Presentations		
Web Resources: i) Related Links		
ii)OER contents		
iii)Research papers & articles		
iv)Videos for further reference		

- ✓ Mention any other e-contents used in the course.
- ✓ Which type of e-contents do you like the most?

- ✓ Please indicate Satisfaction with given aspect of e-content. The researcher has provided some statements given below and you have to identify the right option.

Dimensions	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
The e-contents are well-organized					
The e-contents are related to intended learning outcomes					
The e-contents are suitable to the learning style of students					
The speed at which the content in the video is delivered matches the student pace of learning					
E-contents provides self-assessment with the help of reflective level questions or quizzes					

- ✓ **Dimension 3: Discussion forum.** Which modes of discussion were used in course and share the number of frequencies of using these forums in MOOCs in a week? You can tick mark more than one component of discussion forum.

Discussion Forum **Yes** **No**

Only discussion forum

Only asynchronous (pre-recorded sessions with experts or for FAQs, e-mails etc.)

Only synchronous (Google Meet, Zoom sessions, Live streaming of YouTube sessions with experts)

The combinations of synchronous, asynchronous and discussion

- ✓ Mention any other discussion forum used in the course.
- ✓ Which type of discussion forum do you like the most?
- ✓ Please indicate satisfaction with given aspect of discussion forum. The researcher has provided some statements given below and you have to identify the right option.

Dimensions	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
Active participation by majority of students in discussion forum					
Encourages the communication among learners in the discussion forum					

Feedback by peers is provided on discussion forum					
Timely Feedback by instructor provided on discussion forum					
Build learner confidence by promoting their participation in discussion forum					

- ✓ Did the course use any social media to promote interaction? You can tick mark more than one component of social media.

  WhatsApp

  LinkedIn

  YouTube

  Telegram

  Facebook

- ✓ **Dimension 4: Assessment**. Which of the following type of assessments were used? You can tick mark more than one component of assessment.

Assessment tools	**Yes**	**No**
Multiple Choice Questions		
Fill in the blanks		
Matching Questions		

Short Answer Questions

Quiz

Assignments

Long Answer Questions

Use of rubrics

Peer assessment

Projects

- ✓ Mention any other of assessments used in the course.
- ✓ Which type of assessment do you like the most?
- ✓ Please indicate your Satisfaction with each aspect of assessment. The researcher has provided some statements given below and you have to identify the right option.

Dimensions	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
Provides feedback for wrong attempt on quiz					
Variety of objective questions strategies used					
Use of peer assessment is helpful					
Scope of creativity in assessment					

Used problem-based approach in assessment					
The difficulty level of the assessment is suitable for all students					

- ✓ Mention the time invested per week to complete the module. Please tick the appropriate option:

Less than 1 hour

1-2 hours

2-3 hours

3-4 hours

4-5 hours

More than five hours

Section IV

Students' Engagement

Standardize Questionnaire of Student Engagement

MOOC engagement scale (MES) by Deng et. al. 2020.

Dimensions	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I set aside a regular time each week to work on the MOOC					
I took notes while studying the MOOC					
I revisited my notes when preparing for MOOC assessment tasks					
I often searched for further information when I encountered something in the MOOC that puzzled me					
When I had trouble understanding a concept or an example, I went over it again until I understood it					

If I watched a video lecture that I did not understand at first, I would watch it again to make sure I understood the content					
I was inspired to expand my knowledge in the MOOC					
I found the MOOC interesting					
I enjoyed watching video lectures in the MOOC					
I often responded to other learners' questions					
I contributed regularly to course discussions					
I shared learning materials (e.g., notes, multimedia, links) with other classmates in the MOOC					

Details of Activities Attended During M.Phil. Programme

Paper Published

1. **"Reviews of Student Satisfaction in the context of Online Learning"** published in International Research Mirror, Vol-I, Issue-12, and Page-6-17. P-ISSN-2250-253x, E-ISSN-2320-544x, December-2021. URL: http://www.ugcjournal.com/IRM/paper? type=published

Presentation

1. Participated and presented a paper titled **"Review on Student Engagement in the Context of Online Learning"** in the International Conference on Commerce, Management & Interdisciplinary Subjects (ICCMIS) organized by the Department of Commerce and International Business, School of Business Studies, Central University of Kerala, held on 28-29 October 2021.

2. Participated and presented a paper titled **"Developing 21st Century Skills Using Technology"** organised by 'Bless O Bliss', 6th July 2021.

3. Participated and presented a paper titled **"De-Motivation of Students in Online Class and Increasing Stress in the Situation of Pandemic Covid-19"** at the 'International Conference on Learning 2020, ICL 2020 (online)', organized by The Department of Education, Lady Irwin College, University of Delhi, New Delhi, India, on Tuesday, December 22, 2020.

4. Participated and presented a paper titled **"Promoting Students Well-Being and Managing Stress During the Situation of Covid-19"** in the one-day

international webinar on Promoting Well-being and Managing Stress in Educational Institution through Google Meet on 31st December 2020.

5. Participated and presented a paper titled **"Online & Digital Era of Teaching-Learning: 2020 and the Impact of the Upcoming Generation in India"** in the International Conference on 'Embracing Re-modelling and Transformation: Mapping Breakthrough Innovations' held on 23 January, 2021.

6. Participated and presented a paper titled **"Impact of New Global Economy on Higher Education System in India"** in the Two-day International e-Conference on CLBFEGP held during December 28-29, 2020.

7. Participated and presented a paper titled **"Blended Learning Techniques: A Pathway of Teaching and Learning to Increase Student Attention and Interest"** in an online international conference held on 22nd December, 2020.

8. Participated and presented a paper titled **"National Education policy 2020 and SDG4: Setting a Path to Enhancing the Quality Education"** in the 4th National Teachers' Congress held on December, 2020 in online mode organized by MIT World Peace University, Pune, India.

9. **FDP on Qualitative Research** organized by Institute of Advance Studies in Education (Deemed to be University) from 7/06/2021 to 13/06/2021.

10. Completion course on **Introduction to Statistical Analysis offered by Commonwealth Educational Media Centre for Asia (CEMCA) and Kalinga Institute of Social Science (KISS), a platform on MOOCs** from 01/05/2021 to 10/06/2021

Participation

1. Participated in the UGC (Paramarsh) Online FDP on **"ICT in Teaching & Evaluation"** organized by MSP Mandal's Shri Shivaji College, Parbhani (Maharashtra) during 13th July – 18th July 2020 and scored 50 out of 50 in the final Online MCQ Test.

2. Attended one day International Webinar on **"Technology in 2020's Classroom"** held at Cisco webex Platform on 21st December, 2020.

3. Participated in one day webinar titled **"Advance Excel"** by Dr. Sheshang Degadwala (Sigma Institute of Engineering, Bakrol, Gujrat) on "28th December, 2020" organised by Institute of Technical and Scientific Research.

4. Participated in International Webinar on **"NEP-2020: Prospects and Challenges of Higher Education"** jointly organised by Maa Vindhyavashini College of Education (MVCE), Padma, Hazaribag and Department of Education, Central University of Jharkhand (CUJ), Cheri-Manatu, Ranchi held on December 15, 2020.

5. Participated in the one-day State Level Webinar entitled **Post Pandemic Teaching-Learning Method: A Paradigm Shift** Held on 15th December 2020, Organized by IQAC, Bhairab Ganguly College in collaboration with IQAC, Sree Chaitanya College, Habra.

6. Participated in a workshop on **"ICT Tools and Software for Teaching and Learning"** on July 03, 2021.

7. Participated in the National Level Webinar on **"ICT for Effective Teaching & Learning"** organized on 2nd June, 2021.

8. Participated in National Webinar on "**Digital Transformation of Higher Education in India"** organized on 21st July, 2021.

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Reviews Of Student Satisfaction In The Context Of Online Learning

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ABSTRACT

The teaching learning process and its genuine characteristics have undergone several remarkable changes since last few years. A paradigm shift in education system is noticed and the pandemic COVID-19 has also influenced the changes in education system in form of adoption of educational technology. Modern learning theories mostly focus on personalized learning as an individual quest for meaningful learning experiences. The conventional mode of learning has shifted its pathway towards online teaching learning process to meet the personalized learning requirements and for that reason a new arena of research is needed to comprehend the online teaching learning process for promotion of student's satisfaction. The students' satisfaction has been influenced by the various elements, such as, technology, interactivity, course, instructors in the online learning environment. The construct of student satisfaction in online environment is explored in the present study based on reviews of related literature. It focuses on the factors which influence the transformation of learning process and satisfaction patterns of the students. Therefore, the reviews bring in to light the prominent aspects of MOOCs and their effect on student satisfaction. This study is also focusing on the areas where the researcher and educational institute will rethink on the basis of present paradigmatic transformation that has occurred recently.

Key Words: Online learning, Higher education, Student satisfaction, Course design

Introduction:

Satisfaction is based on fulfilling one's requirements and anticipation. It is basically the judgement of a pleasurable level of consumption which is connected to the total fulfilment of person's life. It is broadly accepted as a desirable outcome (Dr. Motšelisi C. Mokhethi, 2019) of different kinds of the experience of products and services (Hossain,2018). It can be measured by the views of the pleasurable fulfilment of one's wants and needs. Satisfaction is actually a state which is usually felt by a person who has already experienced performance (Weerasinghe, 2017) or an outcome that fulfil one's expectation and service quality (Santiuste et.al, 2015). It is also an important parameter of educational field of excellence. Student satisfaction is becoming a major challenge for the field of higher education, mainly universities and it has been shown that student satisfaction is the major source of competitive advantage (Dhaqane & Afrah, 2016) and satisfaction also leads towards the level of retention of the students (Sahni, 2019) and attraction for the new students and positive words of verbal communication as well. It indicates that the long-term success and survival of the higher education depends upon the quality of services provided by them and the endeavour made by them to achieve student satisfaction that separates one higher education institution from the other. Of late, e-learning is one of the most significant way of learning in the present education system. In natural way, satisfaction in relation of e-learning means the specific perception of specific students towards the system of e-learning (Hew et.al, 2019). The method of the measurement of user satisfaction is a critical matter for both the higher education and in corporate world also. Actually, the measure of satisfaction must be based on more than one quality parameter (Santiuste et.al, 2015). The e-learner satisfaction might be ascertained as a summary of responses towards the different activities of e-learning and it is simulated by various focal aspects, like user interface, content quality, learning community, customization and learning performance. So, it can be said that the term satisfaction has no universal definition, although it is generally described in terms of an emotional, affective and evaluative response (Kaul, 2016).

The students' satisfaction has been influenced by the various elements in the online learning environment. Three important factors which are responsible for the satisfaction of students are the instructor, interactivity and technology (Santiuste et.al, 2015). The other components are based on the communication with all other course constituents, course website, course management issues and course management system used for. Moreover, the students' perceptions of task value with the self-efficacy of the students and their social ability, system quality and multimedia instruction have been identified as the very significant constructs of satisfaction (Baldwin, 2017, Liaw, 2008; Lin, Lin, & Laffey, 2008).

Therefore, it can be said that the students' satisfaction is an important part in the field of learning pursued in conventional mode or online mode. Nowadays, Massive Open Online Courses (MOOCs) is a field which is gaining so much popularity and MOOCs are provided through various national and international platforms which provide opportunities to students to add more feathers on their academic arena. It provides credit scores which are basically added with their higher education courses related to the UG or PG level. SWAYAM or 'Study Webs of Active-Learning for Young Aspiring Mind' is a national platform of the Ministry of Education, Government of India which is an integrated portal for hosting Massive Open Online Courses. It has been developed under the NMEICT. SWAYAM follows four quadrant approaches for designing MOOCs and these are e-content, e-tutorial, discussion forum and self-assessment. The present study attempts to explore the student satisfaction in online learning process and the role of on content design of MOOCs in student satisfaction.

Method:

The systematic review of related literature provides the background and desired knowledge to the researcher. The purpose of this review is to find out some of the related research questions as follows:

i) Which models of student satisfaction are used in online learning process?

ii) What course design is used for student satisfaction in massive open online learning?

In this review of related literatures on online learning with respect to student satisfaction, researcher presents and discuss the paradigm shift of education system, different models of student satisfaction and their relation to online learning as well as the relevance of course design for online learning. The researcher is trying to explore the theoretical and empirical analyses related to above mentioned variables. The review will show the various prominent models of satisfaction, dimensions of course design in relation to student satisfaction.

The study adopts structured review-based methods mostly classified under the broad head of the domain-based review method. Structure review-based method basically based on widely used methods, theories, constructs in the form of different tables and figures where the readers get clear, vivid and insightful information from the data reported and content (Paul & Criado, 2020). It helps the researcher to understand what kind of methods have already been used and what theories and constructs have already been applied. Based on the knowledge and reading several review articles as well as articles related to the topic, researcher first selected the topic.

After that researcher selected some well-known bibliographic database, Social Science citation index, journal citation report which mostly list academic journals with an impact factor for identifying potential sources for review (Paul & Criado, 2020). Researcher used databases such as: Google scholar, SSCI, and "Educational resource Information Centre" (ERIC) and found 1050 articles based on student satisfaction and course design regarding online learning process, and this is the first step of finding articles. After finding those papers, researcher sorted the selected articles on the basis of their suitability with certain keywords in the second step, such as: conventional learning, modern learning, online courses, educational technology, digital technology, satisfaction, higher education, course design, e-content, e-tutorial, interaction, evaluation and researcher shortlisted 300 related studies. Then in the third and final step, researcher finally chose 55 papers whose content

was related to transformation in learning system as well as student satisfaction in online learning. It is a systematic review-based paper and is conducted on research published during 2015 to 2021. Writing a review based integrated literature basically implies using the past and present research to explore the future (Torraco, 2016)

Paradigm Shift From Traditional To Online Based Modern Learning Process:

Traditional learning is characterized as teacher centered and performed in face-to-face mode where teacher is the main source of knowledge. This type of learning encourages one way transfer of knowledge by assuming students as passive learners. Learning mostly happens in a fixed classroom situation, with fixed curriculum and use of technology is not mandatory (Chiu, 2021). Now standing in 21st century, the era of modernization and globalization, learning system has shifted its way from teacher centric to student centric. Modern technology has gradually infiltrated the education system and as a result, many students now prefer to take online classes, as opposed to attending the traditional regular classes. It is because online classes are more convenient than traditional classes for some of the students, and more so for those who have to both work and attend classes. Learning is flexible nowadays and students are able to learn anywhere, anytime with extensive choice of courses.

Online learning also provides an opportunity to students and professionals who would not have otherwise gone back to school to get the necessary qualifications. The teachers have now assumed a new role of virtual tutor and follows personalized system of learning (Kahn et al., 2017). With the traditional classes, students are rarely provided with the course materials by their instructors, and they are therefore expected to take their own notes. It is important because they are likely to preserve such notes and use those later on their studies. In contrast, online learning provides with course materials in the form of video and audio texts (Sorenson and Johnson, 2020). Those materials are easily downloadable. So, the teachers' role is very important in online classes for making course design, preparing course materials, engaging the students in their learning and evaluation process. It has been seen that the learning process has transformed from classroom-based learning to gamification, edutainment, story-telling with technology, outdoor based learning. Moreover, learning is based on principles of constructivism and adopts collaborative approach to help students build their own knowledge.

Some of the collaborative learning methods are peer learning, social media learning, project-based learning, problem-based learning, flipped classroom, blended learning, open-source learning and teachers work towards ensuring the student satisfaction through this kind of learning process (Hu & Li, 2017). Therefore, online education has become a very important part of the education system as they come with many benefits that physical education cannot simply provide. It increases the level of student satisfaction from several angles.

Models Of Learning Satisfaction:

The researcher has reviewed some models related to student satisfaction to understand the most important aspects of satisfaction discussed in various models. Models are helpful to find out the specific dimensions of student satisfaction and it is very helpful for finding diverse significance patterns related to various teaching and learning process.

E-Learning Satisfaction (ELS) Model:

The model of e-learning satisfaction was developed by Wang in the year of 2003. This model of satisfaction included four significant qualities and these are learner interface quality, learning community quality, learning content quality and personalize quality (Wang, 2003). All the qualities play important role in teaching learning process. Content should include understandable modules, up-to-date and well-structured which is fit to the specific field of course. Researcher said, customized e-content is very helpful rather than personalized e-content (Muntean,2017). Course instructor usually incorporates several information, data accordingly to design, develop and deploy for customized e-contents. On the other hand,

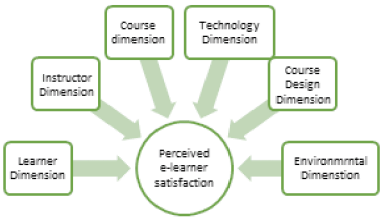
personalized e-content in e-learning can particularly improve the learning routes personalization in an almost transparent way to the user. Personalization is a process of tailoring pages to individual user's characteristics or preferences. E-learning system provides a set of personalization functionalities such as personalizing learning plans, learning materials, test and necessary instant massages etc., to online learners.

The Technology Acceptance Model (TAM):

The Technology Acceptance Model (TAM) was developed by Davis, 1989 and is considered as one of the most influential models of the acceptance of technology. There are two primary factors which influence one's intention to use the new technology and these are perceived ease of use and perceived usefulness. Usually, these affect student's satisfaction and emerges to be the most significant parameter in studies trying to search the etiological relationship amongst the different variables and perceived satisfaction (Aebaugh, 2000). This model is connected to the following factors:

Use	• Easy to learn, controllable, clear and understandable • Flexible, easy to become skilful, easy to use (Sholikah & Sutirman, 2020)
Usefulness	• Makes job easier, work more quickly, increase productivity, • Effectiveness, improve job performance and useful
Student Satisafcation	• Self-efficacy • Enjoyment

Sun, Tasi, Finger, Chen and Yeh (2018) also analysed the above factors that affects student satisfaction and they also tried to analyse the effects of ease of use and perceived usefulness. The result of the study supports that perceived ease of usefulness influences the students' satisfaction significantly. The system of e-learning provides useful contents and helps the students for the advancement of their career. According to the researcher student satisfaction is connected to the following factors:



Information Systems Success Model:

Gable, Sedera & Chan, 2003; Gable et al, 2008 proposed the measurement theory of enterprise system success. There are four parameters which are somehow connected to the Information system success model. These are, System Quality which is based on the ease of use, ease of learning, user requirements, system features, system accuracy, flexibility, sophistication, integration, customization. There are mostly related to the level of satisfaction. Second parameter is Information quality which is based on the availability, usability, understandability, relevance, format and conciseness. These are also fulfilling the satisfaction level. Third parameter is Individual impact which is based on the learning, awareness or recall, decision effectiveness and individual productivity. These are the important components of student satisfaction. Fourth parameter is Organizational impact which is based on the organizational cost, staff requirement, cost reduction, overall productivity, improvement outcomes, increased capacity, e-government, business process change. These components also contribute towards fulfilling one's level of satisfaction.

Construction of an E-learning Course Evaluation Model:

CIPP model is originally used in the field of social sciences for curriculum evaluation developed by Daniel Sufflebeam in the year of 1960. CIPP model stands for context, input, process and product evaluation (Zhang & Jiang, 2007). Based on the CIPP model the researchers developed a model on e-learning courses and this model evaluates the e-learning content materials and the components of this evaluation model are, Planning evaluation, Development evaluation, Process evaluation and Product evaluation, in short PDPP model and the parameters are the following: On the basis of these four parts and 26 items the

researchers choose some of the parameters for student satisfaction on respect of e-learning characteristics, e-learning evaluation and these 14 elements are Web site design, Virtual opening ceremony, Lectures (video programme), E-learning course arrangement, Instructional design, E-learning study units, Flexibility of learning, Communication with the mentor, Communication with the peers, technical support, Assessment, E-learning environment, Course quality (Baldwin, 2017).

Satisfaction Framework model of Thor-Erik Sandberg Hanssen and GisleSolvoll:

It was developed in the year of 2015 and fits well with higher education system. It is the combination of two model and these are satisfaction model and facility model. The former model is dependent variable and the latter is independent variable. The facilities are job prospect, cost of studying, reputation, physical facilities. Satisfaction can be fulfilled when the facilities play their roles properly. Facility model is mostly used as explanatory variables in the model of satisfaction.

Therefore, it can be said that e-learning satisfaction model reflects on the importance of interface quality of learners, several content qualities, and personalization quality. Content quality plays a major role in students' satisfaction which is the part and parcel of every learning.

On the other hand, the Technology Acceptance Model connect the learner satisfaction which is playing a vital role in understanding the path to success in an e-learning situation and it is hoped that this will contribute to an enhancement of e-learning experience as well as instructor, technology and interactivity are the key factors of student satisfaction. Information System success model is also talked about the learning and their awareness to recall of the learners and it can be possible when they fully understand the course materials of that particular course and it also helps the learner to reach the ultimate goals of learning. PDPP model talks about instructional design and it is one of the parameters of learning through online mode. Above all, it can be concluded that those various models have focused on different aspects of satisfaction but some of the aspects like planning, instructional design, learning resources, ease of use, e-learning platform, technical support and development of the course design, process as well as product evaluation together are playing important role in student satisfaction.

Different Views Of Student Satisfaction In Terms Of Course Design In Moocs:

Under the 'Digital India' Initiative of Government of India, one of the challenging and thrust areas is '(MOOCs)'. Ministry of Human Resource and Development (MHRD), now Ministry of Education (MoE), Government of India has embarked on a major initiative called 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) (MHRD Guidelines for MOOCs), to provide an integrated platform and portal for online courses, covering all higher education, high school and skill sector courses (Mondal & Majumdar, 2019). First MOOC emerged from the OER (open educational resources) movement, which sparked by MIT open courseware project.

OER mostly provides teachers, learners, and others research materials with legal permissions to engage students and any medium can be used for preparing that either in digital or otherwise that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation, redistribution by others with no or limited restrictions. Therefore, MOOCs fulfils both the sides. There are various platforms of MOOCs which provide open educational courses, such as Coursera, Canvas Instructure, SWAYAM, edX, UDACITY, KHAN Academy, Future Learn. The MOOC offered on SWAYAM follows the four quadrants approach of instructional design and these are E-tutorial, E-content, Discussion forum and Assessment.

These four quadrants mostly come under course design which is the process of methodology of creating quality learning environments and experiences for students. Through deliberate and structured exposure to instructional materials, learning activities, and interaction, students are able to access information, obtain skills and practice higher level of thinking. The focus of course design is to put together the optimal learning experiences

for students in an environment that is supportive and appreciative of learning and intellectual development. The instructional design should be based on student satisfaction. These are described as follows:

E-tutorial:

An online tutorial is a self-study activity designed to achieve the specific course learning outcomes. They are usually delivered via the internet in form of recorded tutorials which means video or screenshots, typically of a subject expert presenting information and ideas or giving demonstration. Another type of tutorial is interactive tutorials which means a structured collection of navigable web pages. Individual pages can contain any combination of text, image, audio, video, self-test questions and other interactive activities. E-tutorial usually contains the video and audio contents in an organized form, animation, simulations, video demonstrations, virtual labs etc, along with the transcription of the video. Student learns as well as gathers ample knowledge and participate actively. Instructor usually designs and teaches specific courses for certain predetermined learning outcomes.

Often, e-tutorial is followed by reflective level self-assessment questions to help students receive feedback and achieve associated learning objectives of the course. MOOC is a platform where e-tutorial plays most significant role for completion any of the courses in a certain platform. Gameel (2017) gave some indicators and these are the ease of using, stability of the several e-learning systems, ease of finding the content of users need, attractiveness which is related to the graphics, colours and layout (Wang, 2003).

E-content:

The e-content plays a very crucial role in the process of online learning in MOOCs. Wide varieties of digital materials which are of educational significance are available in online mode. Some of the quality materials are available free of cost or with minimum restrictions can be used, reused and modified by teachers and students for their learning as well as teaching. As textbooks are very expensive, the students are switching from textbooks to digital course materials. These materials provide both the students and teachers a greater interactivity and social collaboration. It is becoming popular because of the flexibility of time, place and pace of learning. It is including all kinds of content created and delivered through various electronic media. It can be used by wide variety of diverse learners with diverse needs, different backgrounds, and previous experience and skill levels.

It can be shared and transmitted easily and promptly among unlimited number of users around the world. Students, teachers and others all get benefited by the use of well-designed and developed e-content. According to Oxford dictionary 'e-content is a digital text and images designed to display on web pages.' According to Saxena Anurag (2011) 'E-content is basically a package that satisfies the conditions like minimization of distance, cost, effectiveness, user friendliness and adaptability to local conditions.' E-content usually contains self-instructional materials, e-books, illustrations, case studies, presentations, web resources, such as further references, related several links, open-source content on internet, video, case studies, books including research papers, journals, anecdotal information, historical development of the subject, articles, etc. Nowadays student centric approach is promoted in designing interactive e-content to enhance the student satisfaction (Baldwin, 2017).

Discussion Forum:

Discussion forum is mostly used for raising of doubts and clarifying them on a near real time basis by the course coordinator or his team. The quality of academic support provided in the course is based on the communication between learners and mentors which affects the student satisfaction.

Online discussion forum can also be used for different purposes, such as helping students to review materials prior to an assignment or exam, engaging students in discussion of course materials before class as well as reflecting on materials that they have read or worked out of the class. This forum can be an effective way to boost students in online learning. Student usually post questions related to the course materials, articulate their

thinking about different topics, questions which are posted on forum. The context of communication is based on the feedback and responses for e-learning through email and telephone. Anne (2020) showed his views on student satisfaction and brings forth four collaborative interfaces such as learner-content interaction which is mostly related to the quality of learning experiences of the activities of the course aligned to expectations, learner-learner interaction which is basically based on the interaction with the peer groups, learner-instructor interaction which is based on the interaction with the course instructor or mentor and learner-online platform interaction which is based on orientation programme to online learning (Marcia Anne, 2020).

Assessment:

Assessment, the fourth quadrant in MOOCs plays a very significant role in the process of learning and it is a critical component of the online learning. It provides students an idea of their progress in a particular course, identifies individual strengths and weakness, as well as it ultimately serves as the measure of whether students achieve the course learning objectives. Moreover, each of these characteristics serves a valuable instructional and pedagogical functions. It is also important that assessments engage students and prepare them with the skills they will need in future courses, practicums and even their careers.

It generally contains problems and solutions, which could be in the form of multiple-choice questions, fill in the blanks, matching questions, short answer questions, long answer questions, quizzes, assignments and solutions, discussion forum topics and setting up the FAQs, clarifications on general misconceptions. Yin (2016) discusses the perception of Chinese learners on MOOCs and shows that the several aspects; such as learning goals and content presentation, interactions, assessment and measurement, instructional media and tools as well as learner services and support related to instructional design of MOOCs contributes to user satisfaction the most. The satisfaction with the evaluation and assessment process of MOOCs is related to the different evaluation methods, effectiveness of the evaluation methods, quality of the grading system, quality of peer assessment and quality of feedback.

Yawson & Yamoah (2020) worked to understand the e-learning satisfaction in higher education from the perspective of multigenerational cohort perspective and tried to understand the students' satisfaction with the help of the four components of their experiences.

These are, course design which is based on the details of the course outline is provided by the mentors, objectives of the course communicated, the tentative outcome of the learning shows the learners from the beginning, relevant and recent course content. The next dimension is course delivery which is based on the speaker energy level and enthusiasm towards the topic, the sessions which are sequenced follows the course outline, appropriate presentation of the topics, the coverage of the whole content throughout the session, achieved the outcome of the learning.

The third dimension is course interaction which is based on the electronic forums which is available for the discussion in e-learning platforms, fair and proper respect for student's interaction availability of the coordinators. The fourth and last dimension is course delivery environment which is based on the internet availability, maintenance of proper infrastructure. Kumar and Kumar (2020) focused on the learners, satisfaction from MOOCs through a mediation model. They also showed that the level of learners' satisfaction based on the content of the course, delivery of the content materials which is based on uploading the contents on time, pace, delivery of the contents by the mentor, assessment of the course and different aspects of supporting the course (Baldwin, 2017). They showed that the content delivery and assessment significantly connected to the overall satisfaction level of MOOCs.

On the other hand, course support was also found to be significant with the learners' overall satisfaction. According to the structural model of satisfaction the relationship between course content and overall satisfaction are mediated by the course assessment and the course support is not mediating the relationship between the course delivery and the overall satisfaction.

TABLE: 1

Main Domains of Student Satisfaction:

Course Design	Content Quality	Learning environment	Interaction	Interface Quality	Personalization Quality
Course delivery, Course structure, Course support, course Assessment, discussion forum	Usuability , understandibility, relevance, strcutured, comprehensive. Academic dimension-course effectiveness, Skills based	Technical Support , Instructor Feedback, Academic Support,Affordability, Active discussion forums and learning community Engagement	Learner-content, Learner-instructor, Learner-learner, and Learner-online platform	Ease of use of platform, Technical supIndividual productivity	Personalized learning plans, learning maerials, assessment and commnumcation

the above-mentioned studies show that the students' satisfaction more or less relates to one another and the content design, learner interface quality, content quality, course structure, instructor support, audios and videos, workload, difficulty and course assessment, course schedule, different disciplines of MOOC (Majumdar, 2019) courses, like arts or humanities, social science, science, technology, and estimated course effort per week, faculty interaction , amount of time on task, active and engaged learning, and cooperation among classmates, learning value, (Kumar & Kumar, 2020) all are connected with the four quadrants of MOOCs with some extents. Therefore, different researchers focused on several aspects but these are somehow connected with each other which can identify the learners' satisfaction.

Conclusion And Discussion:

It is very clear that the systematic review of related literature is the heart of any robust research work, more than a simple and small step is taken for the completion of the work. Many studies have focused on transformation from traditional learning to online learning in terms of student satisfaction. Several factors of student satisfaction are there, but some of the aspects appear very frequently which is directly connecting student satisfaction in online learning like course design, content quality, learning environment, interaction, interface quality, personalization quality, and course assessment. These are the different areas which cover any type of online courses like MOOCs. The researcher has been found out those domains with the help of literature review and these are very helpful for upcoming online learning programme. These aspects are connected to one other and on the basis of these parameters' students are generally getting satisfaction during online courses.

With the development of higher education in the world through online mode, the importance of student satisfaction was emerged in the literature of online learning which leads to a few recommendations and suggestions for further research. Satisfaction is basically depending on maturity level of the individuals and other multiple dimensions such as content design which plays a major role for the foundation of teaching and learning. An effective content design means students will be able to participate in deeper learning experiences which is significant in fostering successful learning. Different studies show that the satisfaction of student is mostly connected to the course design, course content, interaction of the course, learner and content relationship, course delivery environment. The theoretical review proved that satisfaction is a psychological process and is affected by many factors.

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INTERNATIONAL CONFERENCE ON COMMERCE, MANAGEMENT & INTERDISCIPLINARY SUBJECTS (ICCMIS)

28-29 October 2021 (Thursday and Friday)

Certificate

This is to certify that **Sanchaita Nath**, M.Phil Scholar from School of Education, Central University of Haryana, has **participated and presented a paper** titled ***Review on Student Engagement in the Context of Online Learning*** in the *International Conference on Commerce, Management & Interdisciplinary Subjects (ICCMIS)* organized by the Department of Commerce and International Business, School of Business Studies, Central University of Kerala, held on 28-29 October 2021.

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