

CHAPTER 5
MAIN FINDINGS,
DISCUSSION,
EDUCATIONAL
IMPLICATIONS, AND
SUGGESTIONS FOR
FURTHER STUDIES

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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 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.

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 (KIRMIZI, 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 & ÇAkırođlu, 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 clarify 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