

CHAPTER II

REVIEW OF RELATED LITERATURE

2.0.0 INTRODUCTION

What do researchers know? What do they not know? What has been researched and what has not been researched? Is the research reliable and trustworthy? Where are the gaps in the knowledge? When you compile all that together, you have yourself a literature review.

- Jim Ollhoff

A review of related literature is an important component of conducting research. The most crucial task after undertaking a research study is to go through literature already existing in the area and acquaint with the available body of knowledge. The purpose of literature review according to the University of Melbourne (2013) is “to determine what is known on the topic, how well this knowledge is established, and how future research might best be directed.” Conducting a literature review helps the researcher in building knowledge and gaining insights on the topic undertaken.

MOOCs are Massive Open Online Courses with unlimited participation and access to all. MOOCs are considered a revolution in the field of online education and their numbers have proliferated in the past few years. It has gathered tremendous attention not only from researchers but also from the general public. Thus, the researcher has tried to study the work conducted in the field of Massive Open Online Courses concerning the present study. This chapter highlights the research in the area of awareness, development, and components of MOOC and also on the teaching-learning of Research Methodology. The reviews of the study are categorized as under.

- Studies related to awareness of MOOC
- Studies related to Teachers’ and Students’ perceptions of MOOCs

- Studies related to users Teachers' and Students' factors and motivations to adopt MOOC
- Studies related to the experience of Teachers and Students' in using MOOC
- Studies conducted on different components or Quadrants of MOOC
- Studies related to drop-outs in MOOC
- Studies conducted on the development and implementation of MOOC
- Studies conducted in the area of teaching-learning of Research Methodology

2.1.0 STUDIES RELATED TO AWARENESS OF MOOC

The researcher reviewed seven studies related to awareness of MOOCs among various sectors of society. The reviewed studies are described below:

Shaikh (2017) conducted a survey study to find the awareness of Massive Online Open Courses among student teachers. Seventy graduate and thirty post-graduate student teachers pursuing B.Ed. & M.Ed. through traditional mode were randomly chosen to understand the extent of awareness about MOOCs. The tool used was a self-designed, pretested, and validated questionnaire to collect information about the B. Ed. And M. Ed. student teachers' Awareness of MOOCs. The answers were then analysed both quantitatively and qualitatively. The study concluded that awareness of students to fundamental information about MOOCs was very poor, though the student teachers knew the full form of MOOCs all other information or knowledge of MOOCs such as enrolment procedure, fees charged, type of courses, duration of courses, and certification procedure was mistaken.

Shigeta et al. (2017) surveyed to find the awareness, offering & adoption of OERs & MOOCs in Japan. The survey had responses from 1215 universities and colleges in Japan. Responses are collected via the Internet, through a password-protected form. The study concluded that while Japan is gradually becoming more aware of OERs but still only limited institutions have offered them, &, although MOOCs are gradually being offered by more universities, their availability remains limited. The survey also found that although OERs are recognized as enhancing the learning environment, MOOCs still seem to be regarded more as outreach activities, similar to the dissemination of educational information and making social contributions.

Singh & Chauhan (2017) conducted a study entitled “Awareness Towards Massive Open Online Courses (MOOCs) and their usage for Teacher Education in India”. on various aspects including conceptual understanding, usability, technological requirements, present practice, and policy guidelines. 156 responses were collected from Teacher Educators and the Awareness Scale using Google Forms was used as a tool. The major findings of the study were that teacher educators do have some basic idea about MOOCs and their strengths the mode of offering the course and its benefits. Further, it was revealed that there is confusion regarding the role of MOOCs in Teacher Training. The study revealed that there is an emergent need not only to develop a proper understanding of MOOCs among Teacher Educators but also to give them facilities to design and integrate MOOCs into their regular classroom practices. The study highlights the need for promoting the use of MOOCs for Teacher Education in India.

Sivakumar (2019) found the awareness of MOOCs/SWAYAM in Student-Teachers. Hundred Student Teacher were taken from Annamalai University as samples. Investigator developed an Awareness of MOOCs/SWAYAM Inventor. Mean, SD and t-tests were adopted in the study. Findings suggested that awareness of MOOCs/SWAYAM among Student Teachers was not adequate.

Ambadkar (2020) studied, “E-Learning Through SWAYAM MOOCs-Awareness and Motivation Among Commerce Students”. The major objective was to find awareness of MOOCs & SWAYAM platforms among students of Commerce and assess factors influencing the utilization of SWAYAM/ MOOCs by students. The questionnaire was administered to 80 students enrolled in two postgraduate programs at the Faculty of Commerce. Random sampling was applied. The study shows low awareness of SWAYAM MOOCs among Commerce students. Although a positive attitude towards learning through SWAYAM MOOCs was found. One of the key factors influencing the utilization of MOOCs as contact with educators was also perceived as a limitation in learning through MOOCs. The study emphasized that there is a need to motivate students to adopt MOOCs as a learning resource.

Karthika (2020) conducted a study entitled “Awareness of MOOC Among Arts and Science College Students In Relation To Their Self-Learning Strategies And Interest Towards Mobile Technology”. This study aimed to see if there is a substantial difference between college

students' background characteristics in terms of MOOC awareness, self-learning strategies, and interest in mobile technology. The investigation was limited to the Chennai District of Tamil Nadu, India. The Investigator created and validated the MOOC Awareness Test (MAT) using data collected from 991 college students in Chennai areas in Tamil Nadu, India. The mean and standard deviation were used to analyze the data. According to the findings, there was a modest level of MOOC awareness. The Science college students' MOOC Awareness was found to be better than the Arts college students' MOOC Awareness.

Subaveerapandiyan (2020) carried out a survey entitled “Awareness and Usage of Swayam Courses Among Library And Information Science Students”. The major objectives of this study were to find out the awareness of SWAYAM courses, actual time spent on learning in SWAYAM Courses, problems faced by students while pursuing the course, and to find out the learning outcome of the student through SWAYAM Courses. 300 students were selected using proportionate stratified random sampling and questionnaires were used as a tool. Analyses were done using descriptive statistics. The study found that most of the responses received from Annamalai University were aware of the SWAYAM course. 74.73% of respondents said that their university provides an orientation program on SWAYAM. More than 82% of the sample spends 1-3 hours on the SWAYAM course. 50% of the respondent agreed that SWAYAM courses help to acquire new knowledge and support lifelong learning.

2.2.0 STUDIES RELATED TO TEACHERS' AND STUDENTS' PERCEPTION ABOUT MOOCs

The researcher reviewed nine studies related to the perception of MOOCs among students and teachers. The reviewed studies are described below.

Gamage et al. (2016) conducted a study entitled, “Evaluating the effectiveness of MOOCs using empirical tools: learners' perspective”. The study looked at how effective MOOCs are. The researcher enrolled in 22 courses from five different platforms and evaluated them while taking them. In this approach, two evaluation frameworks based on empirical research were applied. The findings revealed that there was quality difference across platforms as well as between courses within the same platform. According to the findings, students place a high emphasis on the networked learning culture and exposure to potential industries.

Zheng (2016) conducted a study entitled, “Occupy MOOCs: understanding users’ Motivations, perceptions, and activity trajectories”. A prominent public university in the northeastern United States offered three MOOCs. The study’s sample consisted of students enrolled in these classes. Because of the newness of the MOOC paradigm, the study's main objective was to find the best practices for students, instructors, and even MOOC carriers, how to improve student retention given the high dropout rate, and how to better support MOOC instructors to help them produce more appealing MOOCs. To define distinct students' and instructors’ motives, attitudes, challenges, and activity patterns during learning/teaching in MOOCs, mixed-method interviews along with various types of log data analysis were adopted. Mixed method research was utilized to compare social media use and engagement to official MOOC forums, as well as to highlight the rationales for social media use from the perspectives of instructors and students. To further understand their motives and experiences on both platforms, four instructors and twelve students from three MOOCs were interviewed. Students showed higher engagement and retention in social media than in forums, and researchers identified four reasons for this, including a real community on Facebook, an instructor-initiated discussion forum, a better place for collaboration, and the ability to communicate with others more easily. Instructors said they use Facebook for four reasons: to improve student retention and engagement, to cultivate a feeling of community, to advertise their MOOCs, and to be creative. Through the comparison between Facebook and Coursera, the research attempted to provide several design guidelines for the next generation of MOOCs developers and designers seeking to enhance the students’ learning experience. The research sought to propose various design suggestions for the next generation of MOOCs developers and designers looking to improve student's learning experience by comparing Facebook and Coursera.

Ahmed et al. (2017) conducted a study entitled “the potential and Challenges of MOOCs in Pakistan: a perspective of Students and Faculty”. The study's goal was to examine the evolution of MOOCs, their characteristics, and their potential and problems in Pakistan from the perspectives of teachers and students. Respondents who had completed at least one MOOC provided data via interviews and focus groups. The content and theme analysis, as well as the triangulation of methodologies and sources, were used. Despite constraints hindering the growth of e-learning, the findings of this study show that MOOCs are inspiring a large number of learners in Pakistan.

Kilgore (2018) did an empirical study on Adult College Student's Perceptions of Learning Mathematics through developmental mathematical xMOOCs. The researcher investigated the perspectives of eight adult participants in this descriptive exploratory case study. A quantitative simple random selection strategy was utilized to select individuals who were enrolled in the same developmental mathematical xMOOC, and an online questionnaire was used to assess their perceptions of studying developmental mathematics via xMOOCs. There is no teacher in this self-paced course. The developmental mathematics xMOOC is intended to assist students in reviewing key mathematical ideas at their speed. The developmental mathematical xMOOC was created by Coastal College using the Desire2Learn learning management system (LMS). The data was analyzed and overarching themes were identified using constant comparative approaches. The research question was as follows: What were your thoughts and feelings about learning through developmental mathematical xMOOCs? Why did you decide to learn developmental mathematics through an xMOOC? What suggestions did you have for improving developmental mathematical xMOOCs? What are the personal attributes that eight adult college students believe are required to effectively complete a developmental mathematics xMOOC? The data revealed that the MOOC was popular because it was free, flexible, and self-paced, and it was accessible to everyone with an internet connection and a computer. The desire to gain mathematical confidence and knowledge, passing the college entrance exam, and being an older returning student in need of a flexible mathematics course to refresh their mathematical skills are all reasons why students enrol in a flexible mathematics course. Students who are self-directed & goal-oriented, who are not easily frustrated, who are internally motivated, who are marginalized, and who work alone with little direction enrol in such courses. The new approach to learning is without the presence of a teacher.

Koukis & Jimoyiannis (2018) conducted a case study on teachers' views and perceptions of MOOCs and Teacher Professional Development. The course was developed and implemented in March 2018 by the eLearning Research Group of the Department of Social and Educational Policy department, in the University of Peloponnese, Greece. This MOOC was created to help Greek language teachers improve their technical skills and pedagogical abilities in using google docs as a collaborative writing medium in Greek language instruction, as well as their pedagogical understanding and learning design skills. There were around 326 language teachers (Greek) in secondary education schools were the sample of the study. A mixed-

method approach was used where analysis of teachers' engagement through platform records and their responses to a specific questionnaire were analyzed. The study concluded that the design of the MOOC framework was operative in promoting teachers' active engagement, peer interaction, support, and development of learning design abilities to integrate collaborative writing with google docs in their classroom. Moreover, the majority of participants conceptualized MOOC as a capable environment for their professional development. The study also enhanced teacher awareness and willingness to adopt MOOCs as an effective alternative for teacher professional development.

Sukhbaatar et al. (2018) conducted a study entitled, “Students’ Perception and Experience of Massive Open Online Courses in Mongolia”. The major aim of this study was to assess Mongolian students' MOOC perceptions and experiences, especially the influence of access, skills, and preferences in their practices. A 15 items questionnaire was used and the results were based on 6846 students' responses. A quantitative approach was used in the study. To investigate students’ attitudes toward MOOCs, a survey method was employed. Data analysis was performed using RStudio v1.0.136. The population consists of undergraduate students of the National University of Mongolia and high school students from 8 schools in Ulaanbaatar city. The study revealed that the majority of the students think MOOCs provide a good source of knowledge & have a good influence on their learning experience. Further students doubted MOOC's academic quality & considered it as an additional source of learning materials. The results of this study can be used to compare students' perceptions of other developing countries. The finding suggested that the main reasons for not adopting MOOC were a lack of spare time, preference for the physical classroom, lack of face-to-face communication & unfamiliarity with online learning environments.

Aljaraideh (2019) conducted a case study to find out the aims to identify the challenges and benefits of Massive Open Online Learning (MOOC) as perceived by the professors at the University of Jerash. The sample of the study consists of 130 faculty members from all faculties at Jerash University. A questionnaire was designed and developed by the author. The findings have revealed that faculty members faced many barriers like high dropout rate, complications related to interaction with larger audiences, huge workload, and deficiency of English language skills, computer skills, and motivation. There were also issues associated with plagiarism, lack

of proficiency & it was time-consuming to use MOOC. The results also bring to light that faculty members perceived MOOCs as a great advantage for the users. Professors agree that MOOC provides better learning opportunities than their counterparts. The study also recommends all higher learning education should introduce and implement MOOC for its abundant advantages.

Latha (2019) found out the consumer perspective in India on the challenges and implications of learning through massive open online courses. The major objectives of the study were to study the impact of age, gender, income, educational background, occupational status, and several prior MOOC courses completed on learner engagement and consumer-perceived learning, to assess the mediating effect of learner engagement between consumer motivation and consumer perceived learning. to assess the mediating effect of learner engagement between course factors and consumer-perceived learning, to construct a relevant model through SEM (Structural Equation Modelling) depicting the effect of consumer Motivation, and course factors on engagement and consumer-perceived learning, and to suggest MOOC providers for improving the course success rate. A descriptive survey research design was adopted & sample of the study included 500 Indian learners who have completed at least one MOOC course through Coursera, Edx, or Udacity MOOC platforms. Data were collected by conducting the online survey by posting the URL link on the social media network sites. Secondary data was collected from various research publications, journals, magazines, websites, and newspapers related to massive open online courses. Statistical techniques like exploratory and confirmatory factor analysis, one-way ANOVA, descriptive statistics and structural equation modelling, and mediation tests were employed. The study concluded that 46% of the respondents enrolled in MOOC courses are below the age group of 30. Respondents holding master's degrees have intrinsic motives for enrolling in MOOC courses, where the behaviour is driven by internal rewards. User Motivation, course design elements, and user engagement are the factors that lead to better users' perceived learning. Users of lesser age (less than 30) invest more time in learning. User with a bachelor's degree spends more time on learning-related activity which further leads to the acquisition of better knowledge. Extrinsic motivation plays a major role in determining users' motivation while among course design elements, the factor of Learning resources seems to play a major role.

Verma (2021) conducted a study entitled, “Role of SWAYAM - MOOCs in Democratization of Higher Education”. The objectives of the study were to find the study the perception of participants towards the effectiveness of the SWAYAM platform and a List of challenges faced by SWAYAM participants. A web-based survey was conducted. Purposive Sampling was done for providers and instructors using the SWAYAM platform. A descriptive survey research design was utilized for this research and a questionnaire was used. The responses of participants reflected that SWAYAM could be a solution to most of the educational problems by providing quality education, flexibility in education, transparency, instant feedback, etc. The challenges faced were that the style of teaching of some teachers was not appreciated by the learners as their style in less interactive and it seemed that they were just reading, many times audio-visual was not clear. The lecture videos were very long and boring and tried to cover maximum concepts without relevant illustrations and practice exercises. The learners found the fee for the proctored exam to get the course completion certificate i.e., Rs.1000 high and wanted it to reduce. SWAYAM app is not phone friendly and the video link doesn't work on the Mobile Apps.

Salas et al. (2022) explored teachers’ perceptions of MOOCs and ICT during COVID-19. This quantitative research aimed to analyze the perception of the teachers about the organization of school activities in MOOCs and the use of ICT in the educational field considering machine learning and decision tree techniques (data science). A questionnaire was used to collect data about MOOCs and the use of ICT. The participants were 122 teachers from the National Autonomous University of Mexico who took the Innovation in university teaching 2020 diploma. The study concluded that MOOCs represent a technological alternative to transform school activities in the 21st century.

2.3.0 STUDIES RELATED TO TEACHERS’ AND STUDENTS’ FACTORS AND MOTIVATIONS TO ADOPT MOOC

The researcher reviewed three studies related to motivation and factors to adopt MOOCs among students and teachers. The reviewed studies are described below:

Hew & Cheung (2014) found out the motivations and challenges among students and instructors’ use of MOOCs. The study also focused on student motives for signing up for

MOOCs, student attitudes toward MOOCs, student challenges of learning in a MOOC, instructor motivations for offering these courses, methods used to engage students, & a plethora of challenges encountered in teaching a MOOC. A survey study design was adopted and secondary data were used. The data was searched in two stages. In the primary stage, empirical-based articles in electronic databases were used using the keyword MOOC and open-ended search period. In the second phase, snowballing searches on the papers cited in some of the articles were carried out. The study established four reasons for students to sign up for MOOCs and that is a desire to learn about a new topic or to broaden knowledge, curiosity about MOOCs, personal reasons, and a desire to collect certificates. Drop-out reasons included a lack of incentive, failure to understand the content material, and having no one to turn to for help, along with having other priorities to fulfil. The study also three reasons for the adoption of MOOCs by instructors and that is being motivated by a sense of intrigue, the desire to gain some personal rewards or a sense of altruism. Four key challenges of teaching through MOOC included difficulty in evaluating students' work, having a sense of speaking into a vacuum due to the absence of student immediate feedback, being burdened by the heavy demands of time and money, and encountering a lack of student participation in online forums.

Fianu et al. (2018) conducted a study to look at the characteristics that influence MOOC acceptance and use among students at a few Ghanaian colleges. 270 surveys were distributed to students who had been enrolled in MOOCs, and 204 questionnaires were collected for the study. The study's findings reveal that computer self-efficacy, performance expectancy, and system quality all influence MOOC usage intention. MOOC utilization is also influenced by supportive conditions, instructional quality, and MOOC usage intention, according to the findings. The effects of social influence and effort expectations on MOOC usage intention were shown to be insignificant. According to the authors, colleges must have procedures and resources in place to encourage students to use MOOCs. Computer skills training should be included as well. MOOC designers must use the correct pedagogical approaches to ensure that MOOCs have good instructional quality, as well as ensure that the sites and learning materials are of good quality.

Sharma (2018) adopted a study to find the role of MOOCs in furthering executive education in India. A survey design was adopted. The main objectives of the study were to find the

demographic and psychographic profile of working professionals adopting MOOC programs, to find the effectiveness of MOOCs on working professionals in India, and to identify the motives of working professionals behind taking MOOC programs. 149 responses from working professionals were gathered. Both secondary and primary data were gathered. The organization was shortlisted and contacted out of which employees of eighteen organizations responded with their willingness to participate in the survey. Analysis was done using descriptive statistics, independent sample T-Test, factor analysis, regression analysis, and ANOVA. To collect secondary data, keywords were used, like, as Massive Open Online Courses, MOOCs, MOOC, Digital Education, Online Learning, Distance Learning, SWAYAM, NPTEL, and a few others. Multiple databases and online resources for English-written articles were accessed to fetch quality information like Google Scholar, EBSCO, Scopus, Elsevier, and Research Gate to name a few. The study found that the majority of MOOCs learners were males. Working professionals found MOOCs as a skill-building platform to bridge their knowledge gaps, progress in their careers, remain competitive in the workplace, and leverage the flexibility offered by MOOCs. Working professionals find learning through MOOCs convenient with minimal support from the course presenter and it does not impact their learning effectiveness. MOOCs have no significant impact on their appraisals so working professionals do not rely highly on MOOCs certification

2.4.0 STUDIES RELATED TO THE EXPERIENCE OF TEACHERS AND STUDENTS IN USING MOOC

The researcher reviewed three studies related to the experience of teachers and students in using MOOCs. The reviewed studies are described below.

Adams (2014) explored, “Undergraduate Students' Experiences of Time in a MOOC: A Term of Dino 101. International Association for the Development of the Information Society”. The design adopted was based on Max van Manne's “phenomenology of practice” (2014). The goal was to investigate how we experience our daily lives rather than how we may later conceptualize, hypothesize, or even rationalize them. Phenomenological data was gathered through one-hour in-depth phenomenological interviews with thirty-course graduates, conducted either in person or over Skype. What is it like for undergraduate students to take a MOOC for credit as part of a campus-based curriculum, and how is his time spent in the

unfolding of this experience, was the research question posed? According to the findings, some students packed the course within a few days, while others worked through it gradually. The videos and texts were merely information that needed to be ingested fast and efficiently for the express aim of passing an exam, and time seemed to move in a hurried or machine-like haze. Others had unexpectedly heart-breaking moments, such as an hour spent working through tough terminology with a sibling, or the abrupt end of the MOOC video lectures, which unmistakably marked the end of an enjoyable course. With a sorrowful aura of finality and grateful thought, time slowed and expanded or paused suddenly here. In both circumstances, the moment or event was filled with lasting meaning.

King et al. (2018) explored the experiences of a group of Timorese English language teachers from Lorosa'e English Language Institute in Dili who participated in a professional development MOOC entitled Teaching for Success: Lessons and Teaching between March & April 2017. The research drew on the principles of Participatory Action Research (PAR) and used an ethnographic approach to data collection. The tools used were participant observation, individual, and focus group interviews & authors' reflections to outline the benefits and challenges of doing blended MOOCs. The research drew on the principles of participatory action research and used an ethnographic approach to data collection. The benefits found were Access to quality learning resources, sharing and learning from others, encouraging reflective learning, motivating teachers to try new things and develop their teaching practice, and improving participants' English. The challenges encountered were time management, internet access, course design issues, limited certification payment methods, and prohibitive cost.

Vezne (2020) looked into Teacher Candidate Satisfaction with Massive Open Online Courses in Turkey. The main goal of this research is to find out what teacher candidates think about MOOCs and how satisfied they are with them. A mixed-method technique was used to conduct a case study of a public institution, which included open-ended questions and a Likert-type scale. The satisfaction of teacher candidates with MOOCs was assessed at Akdeniz University with 108 participants from the mathematics, science, and preschool teaching departments. To calculate descriptive and inferential statistics, quantitative data was loaded into the SPSS program. Mean and standard deviation was used to examine teacher candidates' MOOC satisfaction levels. An Independent Samples T-test was used to see if there was a difference in

teacher candidates' satisfaction levels in paid and unpaid courses, as well as synchronous and asynchronous courses. The findings suggest that MOOCs have a beneficial impact on teacher candidates' personal growth and learning experiences and that they are satisfied with them. Only learner–instructor interaction satisfaction is poorer in asynchronous courses. They wanted to be more involved in MOOCs as adult learners. These findings add to a better understanding of MOOC learning satisfaction and help to build and develop better MOOCs that meet the needs and demands of learners.

2.5.0 STUDIES RELATED TO DIFFERENT COMPONENTS OR QUADRANTS OF MOOC

Massive Open Online Courses consist of four quadrants or components which include video lectures, assessments, discussion forums, and additional resources. In this section, the researches done on quadrants of MOOCs is reviewed.

2.5.1 ASSESSMENT

Admiraal et al. (2015) conducted a study on assessment in massive open online courses. What is the link between self and peer assessment and quizzes, and to what extent do quizzes and self and peer assessment account for disparities in students' final test scores? Intermediate quizzes, self-assessments, and peer assessments were used in addition to final exams in two MOOCs hosted by Leiden University in the Netherlands. The first MOOC lasted for 5-8 weeks. Small video clips, discussion forums, quizzes, a case study, and a voluntary test were all included in this course. The second MOOC was a 5-week MOOC featuring weekly videos, quizzes, peer assignments, and an optional final exam. Each of the two courses needed 5 to 8 hours of weekly student effort. Weekly quizzes, self-evaluation, peer assessment, and a final exam were among the four types of assessments used. Participants who took the optional final exam made up around 10% of the overall student enrolment. Descriptive statistics, reliability indices, and correlations between all assessments were employed in the analysis, and regression analyses were performed to explain disparities in final test results between students. Both the self-assessments and the peer assessments had a high level of dependability. We suggest that self-assessments may not be a credible technique to judge students' success in MOOCs based on low correlations with final test marks as well as other evaluation formats.

However, disparities in students' final test results were largely explained by weekly quizzes and peer assessment, with one of the weekly quizzes serving as the largest explanatory variable. Both self-evaluation and peer assessment, we believe, should be utilized as an assessment for learning rather than an assessment of learning.

Chauhan & Goel (2016) listed the features of the quiz in MOOC. The authors have divided the characteristics of MOOC quizzes into two groups: 1) independent quizzes and 2) embedded or in-video quizzes. Components, features, and alternatives for each quiz category have been determined. For each quiz category that has been identified, a checklist was provided. Research of three MOOC platforms, Coursera, edX, and Udacity, was undertaken to discover and formulate the checklist of features for quizzes in MOOCs. The features available to a learner taking a MOOC quiz are listed in an independent quiz checklist. The checklist aids in determining the elements that must be included for each quiz during requirement specification. The characteristics provided to a learner by a quiz embedded in a video lecture are listed in the embedded quiz checklist. The checklist assists in selecting the elements that must be offered for the in-video quiz during the requirement specification process. The study found that the presence of embedded quizzes is marked by Coursera only.

Ventista (2018) conducted a study on self-assessment in MOOCs. It was primarily concerned with the evaluation of open-format questions in MOOCs. It describes the present assessment methods in Massive Open Online Courses and proposes that self-evaluation, rather than peer assessment, should be the only formative assessment approach for xMOOC essays. When it comes to open-ended questions and essays in MOOCs, this research argues that self-evaluation is the most effective and suitable approach to formative assessment. Although there is a good chance that self-image bias will be present during the self-assessment process.

Xiao et al. (2019) conducted a study entitled, "Challenges and Opportunities for effective assessments within a quality assurance framework for MOOCs". From two extensive and widely used QA frameworks for online learning programs, this study established a quality assurance framework for assessing MOOC assessments. This framework was used to evaluate a series of MOOCs and on-campus courses offered by a university's hospitality faculty. The results reveal that the MOOC program's assessments are generally equivalent to the offline QA

methodology. However, there are some distinctions. These disparities represent three issues: (1) MOOC evaluations' insufficient hurdle function in qualification verification, (2) their inadequacy in training and assessing higher-order practical competencies, and (3) learners' unmet position as co-creators and co-assessors. These obstacles can be turned into opportunities for MOOCs to be better positioned as effective educational resources in the hotel and tourist industries.

2.5.2 DISCUSSION FORUMS

Onah et al. (2014) investigated the difficulties surrounding forums through brief literature analysis and data from a specific MOOC hosted by the University of Warwick, UK. Two modes namely peer-supported and tutor-supported were adopted. Comparison of forum participation is possible due to two parallel distribution modes. The findings show that forum use is low overall, that tutor moderation may shut down members' discussions, and that peer-help forums do not provide appropriate support. The study concluded that in most MOOCs, forums are seen as an important support mechanism, but utilization of forums is perceived by many as quite low in general and often confined to a fraction of participants.

Chiu & Hew (2018) studied the impact of three main forms of online MOOC discussion forum activities (watching, voting, and commenting) on student peer learning and performance was explored (quiz scores). For examining factors influencing peer learning and performance stepwise regression models were utilized to analyze two data sets from humanities and art MOOCs supplied by a private university in the United States. Viewing and commenting were found to be the most effective predictors of peer learning and performance. The learner's study purpose, weaker instructor-learner ties, and voluntary forum participation are three probable explanations for the findings.

Singh & Morch (2018) studied the experiences of participants in the University of Oslo's first worldwide MOOC. The purpose of this study was to compare how students enrolled in computer programming courses use the discussion forum. A total of 4700 students enrolled in two MOOCs of a computer programming course. The nature of the posts in the discussion forums was analyzed using open code, and additional analysis was done based on the categorization of each discussion thread. It concluded that the two MOOC platforms'

discussion forums were used differently and tended to coincide with the instructor's function and the platform's design. However, the dominance of social posts and the absence of in-depth debate on both platforms implies that additional means of boosting course content discussion participation should be investigated.

Ouyang et al. (2020) looked at learner discussion patterns, perspectives, and preferences in a Chinese MOOC. Learners' discussion habits, perceptions, and preferences were investigated using a mix of methodologies. The first author built and facilitated an eight-week Chinese MOOC, which was hosted on China's major MOOC site, I course. Purposive sampling was used. 23 of the 850 online students who enrolled took part in the discussions via the MOOC forum and the WeChat group. All of the discussion posts and comments from the MOOC forum and the WeChat group at the end of the course were saved. Within one week of the course's completion, semi-structured, in-depth interviews with the six participants were conducted over the phone. Participants were asked to submit a brief reflection on one or more crucial events related to an essential learning experience that they remembered during or after the training. To study and comprehend the participants' discussion patterns, perspectives, and preferences, social network analysis, content analysis, social cognitive network visualization, thematic analysis, and thick description were employed. According to the findings, socially engaged students contributed the most knowledge, while socially inactive students contributed the least. Second, in terms of perception, socially and cognitively active learners tended to have a favorable opinion of the course design, pedagogy, and analytics tool. Inactive learners, on the other hand, tended to have a poor impression of MOOC discussions, which led to their inconsistent engagement. The results demonstrated a complicated knowledge production process that connected the MOOC conversation with subsequent knowledge application, extended learning, and offline contact from the perspective of choice.

2.5.3 VIDEOS

Guo et al. (2014) conducted an empirical study of how video production decisions affect student engagement in online educational videos. On the edX MOOC platform, 6.9 million video-watching sessions were used across four courses. Students' engagement was measured by how long they watched each video and whether they attempted to answer post-movie

assessment questions. Findings revealed that shorter films are far more entertaining, and movies that intersperse an instructor's talking head with slides are more engaging than slides alone, according to the findings. High-fidelity studio recordings may not be as captivating as videos with a more personal feel. More entertaining than PowerPoint slides or code screencasts are Khan-style tablet drawing courses. When split up for a MOOC, even high-quality pre-recorded classroom lectures aren't as interesting. Videos with instructors who speak quickly and enthusiastically are more engaging. Students react to lectures and tutorial videos in different ways. Future course producers should invest extensively in pre-production lesson preparation to split films into chunks shorter than 6 minutes, according to the study. The study recommended to film in a less formal setting where in big-budget studio productions may not be necessary.

Hibbert (2014) investigated what makes a compelling online instructional video. An internal team at Columbia University's School of continuing education created online courses for a range of programs. Students took part in in-depth interviews on their course media learning experiences. The study revealed that the use of planning films to relate directly to course tasks and evaluation was one of the primary outcomes. Faculty members were encouraged to employ conversational language in their productions, as well as to use humor and rely on previous experiences. Adding audio/visual features to the video to support the material, videos should not deliver information that students could learn by reading text alone. Creating high-definition videos and keeping the four-minute view time in mind when creating longer-form content lectures that can be split up into smaller chunks as a design consideration.

Mor & Warburton (2016) explored patterns for using video in MOOCs. The Participatory Patterns Workshops methodology was used in the MOOC Design Patterns project to engage experienced MOOC designers in a process of collaborative reflection and pattern mining. The article highlighted five patterns that emerged from the research, four of which were discovered after the experiment was completed. Make sure that watching video-based material does not take up too much of the learner's time. Place the quiz before the video and follow it up with a reflection task. Hold video material to six-minute chunks to keep students' interest when delivering content. To get people's attention, use a person, then focus on the content to get the

point across. Structure your movie to grab people's attention, clearly explain the topic, and help them remember what they've learned.

Atapattu & Falkner (2017) conducted a study entitled, “Discourse Analysis to Improve the effective engagement of MOOC Videos”. The objective of this study is an in-depth examination of 1.5 million video exchanges from a programming MOOC. There were 26,129 people registered during the original offering. The course covered basic programming ideas as well as how to create artwork and animations with processing. The course was 6 weeks long and included an average of 8 videos every week. A video's average length was 3.63 minutes. The course was taught by three lecturers, each of whom was responsible for around one-third of the material. The three speakers present in a similar manner (e.g. talking heads, programming screens). 1.5 million de-identified records of video interaction events (e.g., play/pause, video seek) were recorded. To measure discourse and linguistic features, discourse analysis involved extracting sentences from transcripts. The findings emphasized the necessity of avoiding long sentences, lowering lexical diversity and speaking rate, increasing the use of causal connectives, and using content terms frequently.

Bonafini (2017) explored the effects of participants' engagement with videos and forums in a MOOC for teachers' professional development. The research questions framed were, what are the characteristics of MOOC participants who are seeking professional development? Exploratory data analysis was used to answer this question. What factors influence MOOC completion for professional development? In this question, categorical predictors were linked to a binary outcome. Is MOOC completion linked to the number of posts and videos watched by participants? 817 people signed up for this MOOC. Findings revealed that the number of videos watched by participants had little bearing on the likelihood of completing a MOOC.

2.6.0 STUDIES RELATED TO DROP-OUTS IN MOOC

Although many students enroll in MOOCs to explore and gain knowledge, dropping out is also a remarkable feature observed in MOOCs where students leave the course for multiple reasons. Below are various studies related to dropout in MOOCs.

Onah et al. (2014) conducted a study entitled “Dropout Rates of massive open online courses: Behavioral Trends”. This study explores MOOC attrition from a variety of angles. Current literature on MOOC dropout rates, combining existing findings on completion rates with evaluations of various individual courses to discover factors that correspond to dropout risk was analyzed. A meta-analysis of previously gathered basic data on overall dropout rates to uncover connections between course characteristics and dropout rates was conducted. In addition, the literature was examined from a qualitative standpoint, bringing together data on the causes of dropout as well as techniques for resolving or lowering the dropout rate. A preliminary analysis of data acquired from a Computing MOOC run by the University of Warwick in the United Kingdom and presented using the Moodle platform, based on themes identified during the initial inquiry was given. Different components of students’ demographic data are scrutinized to see whether there are any correlations with persistence. The fact that this course has been run in two concurrent modes was an essential aspect. This enables a direct comparison of the dropout rates for the two modes. Qualitative data from student evaluations were also taken into account. Findings showed that many participants who may be considered dropouts (for example, because they did not finish all of the required components for a certificate) are nevertheless actively engaged in the course in their way (either at a slower pace or with selective engagement). This implies that the structure of a course may not be advantageous to all participants and that encouraging diverse forms of engagement and material presentation may be beneficial.

Rothkrantz (2016) explored the dropout rates of regular courses and MOOCs. A special MOOC called Pre-University Calculus was designed. The MOOC’s purpose was to refresh students’ mathematical knowledge before they began their academic studies and to educate them on lacking topics from secondary school mathematics. In total 794 students enrolled in the course. Only 5% completed the course. The training materials consisted of a 10-minute video segment featuring a variety of simulations, video lectures, games, and other activities. According to the findings, normal courses have high dropout rates of around 40%. From the results of surveys and interviews, it was found that high dropout rates were due to a lack of collaboration in networking, a lack of social control of peer students, and an inability to manage the study.

Bezerra & Silva (2017) identified the reasons that lead to higher dropout rates in the courses offered as MOOCs. From 2008 to 2016, a systematic review of the literature was conducted. Twenty four articles, which are part of this analysis, were selected. Some of the reasons for high drop-out rates were cited which included, a lack of social interaction and cooperative engagement among students, as well as group work. The profile of the students was heterogeneous, with a lack of motivation on the student's part, and insufficient time to devote to the training/time management difficulties. Due to the student's lack of prior knowledge and preparation, and difficulties in relating concepts with applications, the course's level differs from what was expected before the start. There aren't enough feedback activities, having problems with the English language and the course did not match my expectations, and also the student lacked maturity.

Aydin & Yazici (2020) investigated the elements that contributed to MOOC participants' non-completion in Anadolu University's MOOC Platform, as well as their recommendations for improving these MOOCs. The data for this case study was gathered via an online questionnaire with open-ended questions. To get at the themes of noncompletion causes, a content analysis approach was used. Personal reasons, platform (program)-based reasons, and design-based reasons were the three themes that emerged. "Other duties" was the most often reported cause for non-completion among personal reasons. Meanwhile, the most common platform program-based reasons were the length of the courses (too long), and insufficient timely response from the instructors was the most common content design-based causes. The better course starts and end dates, video quality, a more user-friendly interface, and variety in the course content are among the primary recommendations for improvement.

Goopio & Cheung (2021) explored the MOOC dropout phenomenon & the retention approaches. A rigorous systematic narrative review of journal articles was conducted. In the abstract and content, the keywords MOOCs, dropout, retention, and completion had to be present. Second, journal papers were found using four databases: Scopus, Web of Science, EbscoHost, and ScienceDirect, as well as a snowball search on Google Scholar. Third, the publication period covered the years 2008 to 2018, which is considered the MOOC's evolution period. Fourth, only empirical research was taken into account; non-empirical studies such as literature reviews, idea notes, reports, and book chapters were not taken into account. Finally,

only peer-reviewed journal publications were chosen; conference proceedings and unpublished theses were not considered. Sixth, studies had to focus on the MOOC dropout phenomena, with those that did not explicitly address dropout drivers or retention techniques being disqualified. Only studies that had been published in English were chosen. Critical analysis was performed on a total of 22 publications. Open-coded content analysis was used to classify the papers that were chosen. Course-related elements like course design, interactivity, and online technology, as well as learner-related factors like the learner's experience, time management, language competency, and other personal or situational characteristics, identified various factors impacting dropouts and were classified into seven themes. Retention methods were also discussed concerning the key dropout issues; however, no proven remedy was offered, and many of these strategies have yet to be tested. As a result, empirical or case studies on the efficiency of MOOC retention tactics were recommended. The study concluded that MOOC dropout and retention issues are better understood when participants' learning goals are established.

2.7.0 STUDIES CONDUCTED ON THE DEVELOPMENT AND IMPLEMENTATION OF MOOC

The researcher reviewed 20 studies related to the development and implementation of MOOCs. The reviewed studies are described below.

Li et al. (2014) conducted a study entitled, "The Curriculum Design and Development in MOOCs Environment". In a case study of a major MOOC platform in China, the research examines the subjects, organization, presentation of course content, use of media, and teaching design of over 20 online courses. On this foundation, the paper summarizes the principles of curriculum design and design models in the MOOC environment, including practical course content, minimized but continuous course structure, simplified course content, effective media integration with content, learners-centered, and a focus on social construction. The author was not only a part of the MOOC curriculum creation team, but also takes online courses as a learner, and uses the case study approach to synthesize the principles of curriculum design and design models after examining the design aspects.

Najafi et al. (2014) integrated a MOOC into secondary school courses. The learning and assessment components of a behavioral economics MOOC that was integrated into their school-based course were investigated by high school students attending a university preparation economics course. Students were divided into two groups: MOOC-only students who did not receive any teacher support, and blended mode students who received weekly tutorials. On the achievement test, MOOC students scored slightly lower but slightly higher on a MOOC test on the platform. An experienced teacher, who was also a study co-investigator, taught the two participating class sections. The pupils in this course ranged in age from 15 to 17 years old. Out of a total of 32 pupils, twenty-nine volunteered to take part in the study. Students' participation in this study was entirely optional, and it had no bearing on their formal evaluations or course outcomes. Even though MOOC-only students watched more unique videos, blended-mode students stayed on track with the MOOC better. Students in the hybrid mode were more persistent in retaking quizzes, but they scored lower than MOOC alone students. Findings suggest that MOOCs can be integrated into school-based courses in a self-study format. Students worked independently on the learning and assessment components of an integrated MOOC. It's worth noting, though, that the study's participants were high-achieving and intrinsically motivated kids, which could have influenced their degree of involvement. Curriculum design issues arise when MOOCs are integrated into school-based courses, as classroom teachers must locate appropriate information that complements their existing curriculum. Another finding suggested that professors should carefully consider the cognitive benefits of MOOC integration. One issue identified was the long-term practicality of an integrated MOOC. If an integrated MOOC's supplier platform is deleted, the teacher may have to find a substitute or leave the integration. The study recommended understanding students' experiences through interviews and detailed reflection notes would shed more light on their perception of the usefulness of the integration and the challenges they may have faced.

Rubens, W. (2014) conducted a study entitled "Improving the Learning Design of Massive Open Online Courses". In a series of nineteen MOOCs known as online master classes, this article outlines the construction of an adequate learning design. Using theory and personal experience the iterative development of the learning design in the several runs was led by 13 pedagogical needs, which include, that learners should be able to access information sources and learning activities that keep them current in their field through online master classes.

Learner control over the intensity of participation should be encouraged in online master classes. Learners should be able to choose the learning activities they want to engage in online master classes. Learners' prior experience should be used as a starting point and input for online master classes. Learning activities and technologies encourage people to share their experiences. A reciprocal design should be used for online master classes. Experts can see the learner's interactions with other learners. The expert will intervene and support the learners if necessary, such as in the case of misconceptions. The content of the online master class will be adjusted based on these interactions. Experts and non-experts should be distinguished in online master classes. Non-experts should be given the chance to interact with experts. Online masterclasses should encourage information retrieval and prior knowledge activation. Learner-content interaction, learner-instructor contact, and learner-learner interaction should all be encouraged in online master classes. Active engagement should be encouraged in online master classes. Learners should be encouraged to apply what they've learned and incorporate new knowledge into their everyday routines through online master classes. Synchronous sessions in online master classes should encourage learners' participation and motivation. Online masterclasses should have a clear structure of learning activities that take place over a set period, and they should encourage students to expand their scientific knowledge. This instructional style drew a group of students who had previously avoided the Open University's learning activities. Seventy-one per cent of learners in online master's programs were not existing workers or students at our university, and 89 per cent were beyond the age of 35. This online master class had a total of 2083 individual students enrolled. User satisfaction is generally high and consistent.

Griffiths et al. (2015) conducted a study entitled, "Adopting MOOCs on Campus: A collaborative effort to Test MOOCs on Campuses of the university system of Maryland". A mixed-method study was undertaken to examine the use of MOOCs in fourteen campus-based courses. 14 faculty members and 855 students were the samples of the study. Two different types of findings were obtained quantitative outcomes from students in hybrid sections, comparing students who took MOOCs with those who were taught in a traditional face-to-face manner; secondly qualitative findings on the opportunities and challenges presented by the use of MOOCs on campus. Faculty identified six types of benefits for students in their hybrid courses using MOOCs, replacing lectures, Augmenting or replacing secondary materials,

filling gaps in expertise, exposing students to other styles of teaching and class discussion, teaching students how to learn online, reinforcing key skills, such as critical thinking. It was also found that differences between students in hybrid sections and those in traditionally taught sections were not statistically significant.

Israel (2015) reviews MOOCs that were incorporated into traditional classroom settings. The report also looks into the preliminary findings of the effectiveness of learning outcomes and their impact on students and instructors in blended MOOCs. There were four different models discussed. In model one, a group of 26 students from the University of Puerto Rico Rio Piedras, Puerto Rico, took a Stanford introduction to databases MOOC in a traditional classroom in Spring of 2012. They stated that the teacher acknowledged the benefits of the public course materials in MOOCs because they provided various acceptable video lectures, quizzes, and assignments. Although, students were spotted not participating actively in the discussion forums. In model 2 Stanford University's machine learning MOOC was integrated with Vanderbilt University. This blended MOOC was attended by a group of ten students. Students determined that machine learning MOOC was appropriate for self-paced learning because it was flexible, adjustable, and easily available. In model 3, The University of Politehnica Timisoara, Romania, deployed a blended MOOC for a group of 70 students in web development using an educational microblogging platform called Cirip. The overall satisfaction with the mixed course was positive, according to the report, albeit exact data was not supplied. On the Udacity platform, San Jose State University (SJSU) offered three colleges preparatory MOOCs in model 4. Over 15,000 students had signed up for this course. According to the study, students between the ages of 18 and 24 performed better than those older than that. Overall, the analyzed studies found small positive benefits on learning outcomes, no significant evidence of negative effects for any subgroups of students, and lower levels of student satisfaction in blended MOOCs in classrooms. The study concluded that MOOCs, in general, have the potential to provide outstanding resource materials in the form of video lectures, quizzes, and assignments, though synchronizing them with regular in-class courses and integrating MOOCs with on-campus LMS and rules are problems.

Soffer & Cohen (2015) conducted a study entitled, "Implementation of Tel Aviv University MOOCs in the academic curriculum: A pilot study". Here is the feasibility of implementing

MOOCs as part of the academic curricula for undergraduate students, and described the scope and intensity that exists in TAU courses in terms of learning, teaching, and assessing, especially during the early stages of a course. The early data was gathered from 30k enrolled students. Coursera log files and a university teacher survey provided data on students' range of activities, the intensity of involvement in the course, and attitudes. MOOCs' penetration into the higher education system, according to the report, provides an alternate learning paradigm that incorporates a wide range of activities such as video courses, interactive participation in forums, online tasks, and feedback. The study concluded that incorporating MOOCs into academic institutions for undergraduate students could provide several benefits, including flexible learning environments, enrichment with courses taught by leading experts in various fields, and exposure to intercultural learning experiences that can help students develop 21st-century skills.

Goncalves et al. (2016) explored MOOC in Teacher Education through a case study. To entice teachers to this new manner of sharing knowledge, a MOOC was created and deployed. "A MOOC on MOOCs and Other Educational Technologies" was the title of the MOOC, which drew 17 teachers. Fifteen people completed the training course and used the Udemy platform to construct their own MOOCs. The participants came from a variety of academic backgrounds and worked in a variety of fields. Nonetheless, in terms of using synchronous and asynchronous tools, their digital skills were relatively similar. The study's goal was to clarify the role MOOCs can play in teacher education, as well as to learn about teachers' perceptions of their progress after creating and implementing their MOOCs. Data were collected using questionnaires before the course, at the end of the course, and four months later. According to the results of the questionnaires, the participants regarded the MOOC as a scientifically valid training course that had made a significant contribution to their ongoing education. The study also concluded that although MOOCs have been attacked by some and welcomed by others, the truth remains that they are gaining popularity as an educational novelty, particularly because they have such a large pedagogical potential in the new digital environment of the twenty-first century.

Janssen et al. (2016) shared their first experiences regarding the design and early development of "Sustainability in everyday life". An action research approach was used to reach the objectives. The research objectives were to find actions did the teachers take to initiate and

make progress during the design process? What have the roles of the teachers been during the design process? How did the teachers engage the project group and their colleagues, and how did they communicate their ideas? The teachers' narratives regarding the MOOC's design and early development phase offered the data for answering these issues. The narratives were produced in chronological order, reporting and reflecting on meetings and other events (workshops, seminars) that occurred between early May 2014 and early February 2015. According to the findings, the roles of teachers, as well as the procedures and activities that take place throughout the design and early development of MOOCs, are inextricably intertwined and must be carefully studied to ensure a successful MOOC design and development process.

Oakley et al. (2016) conducted a study entitled, "Creating a Sticky MOOC". The researcher looked into "How to Learn", a UC San Diego MOOC that is one of Coursera's most popular courses with the highest enrolment. The course drew approximately one million students in its first year. Because of the high levels of student happiness and continued strong student interest in the course, it's worth digging deeper into the course's dynamics to figure out what's driving its popularity and pleasure. Students' replies to an open-ended question were used to create a list of possibly important stickiness properties for this work. This open-ended inquiry drew 2,332 responses. Finally, the study proposed a set of essential qualities for establishing a sticky (stay till the finish) MOOC, such as students placing a high value on instructors who communicate, are friendly and engaging and represent course values through their teaching choices. Students love quizzes that help them learn since they are an expected element of learning. The format and timing of the presentation are crucial. Students thrive when the material is not overly difficult, is presented in small chunks that can be easily navigated using a variety of paths and can be completed at a convenient time over several weeks, and when they have the sense that the MOOC presents a coherent set of important course concepts, evidence-based, and of practical significance to their lives.

Perifanou et al. (2016) conducted a study to aid language teachers and language and training providers in designing and developing successful large open online and interactive language courses for everyone. The study comprises a collaboration of highly recommended language teachers as well as private educational institutions' instructional designers and developers to

determine the best appropriate MOOC platform for their needs. Select a platform that can provide a variety of open assessment tools, as well as a system that allows for multi-level assessments such as peer-peer, student-teacher, group-group, and student-open communities throughout the learning process. The study concluded that creating an effective language learning environment for a large group of people is difficult. To reach this goal, it will take a collaborative effort from instructional designers, developers, and language teachers who will build, implement, and evaluate various MOOC situations. A smart place to start is to share good ideas, techniques, and examples of these projects.

Orsini-Jones (2017) integrated a MOOC into the postgraduate ELT curriculum and reflected on students' beliefs with a MOOC blend. This study was the third cycle of an action research project carried out in the School of Humanities at Coventry University (UK). The first phase of the project investigated the engagement of six members of staff and two expert students with the blended MOOC pilot which had been integrated into the module Theories and Methods of Language Learning and Teaching, while the second phase focused on the evaluation of the student's reflection on the experience of studying the MOOC in a blended learning model. The findings of the study revealed that the pre-and post-test MOOC appeared to have changed students' beliefs regarding some areas of troublesome knowledge (like grammar). Many appeared to associate it only with independent learning, rather than seeing its links with reflection and collaboration. The majority of the participants recommended that MOOCs should be integrated into more modules.

Inchiparamban (2017) conducted a study entitled, “Developing and Implementing a MOOC In Educational Technology for Student Teachers and Testing Its Effectiveness – An Experiment”. A MOOC in Educational Technology was created and tested on student teachers in this project. This was accomplished using a quasi-experimental pre-test post-test non-equivalent group design. Student teachers enrolled in the Bachelor of Education (B.Ed.) program at teacher training institutions connected with the University of Mumbai in Mumbai and Navi Mumbai formed the study's sample. The MOOC was given to the experimental group, whereas the control group received no treatment. After the MOOC was introduced, a researcher-created Achievement Test in Educational Technology was utilized to assess the performance of student instructors. Parametric tests, such as the t-test and Wolf's Formula,

were used to assess the data. According to the findings, the treatment was successful in improving student instructors' knowledge and awareness of educational technology. The study recommended that teachers should create online courses which would not only be able to cater to their own pupil's needs, but also to students all over the world, and their professional development would be enhanced as a result.

Alturkistani et al. (2018) conducted a study entitled, "Determining the Effectiveness of a Massive Open Online Course in Data Science for Health". This study is an evaluation of a MOOC delivered by Imperial College London in aggregation with a Health study. After completing the MOOC, students stated learning outcomes, attitudes, and behaviors were examined in this research. The study used a mixed-methods approach, drawing on data from semi-structured interviews transcribed and analyzed using Braun and Clark's theme coding method. The sample was 191 participants. For the course evaluation, two participants who completed at least 75% of the course were interviewed. According to the findings of the analysis, the course attracted target learners, who found the course's application and engagement approaches to be beneficial. Learners viewed the MOOC's training to be useful and have the potential to be implemented in their workplace in the future, and they highlighted several work-related impediments to knowledge application. The findings of this study support the notion that MOOCs can promote learning and knowledge achievement in practical skills-based knowledge in general. The availability of lecture videos, self-assessment tools, and strong networking and communication between learners are all factors that influence student engagement. In terms of knowledge application, support and the availability of appropriate resources are critical, because learners will be unable to apply their learning in the workplace if it lacks the necessary resources and assistance. When creating MOOCs for continued professional development, MOOC creators should consider work-related hurdles.

Andone & Mihaescu (2018) conducted a study entitled "Blending MOOCs into Higher Education Courses-A Case Study". The experience of integrating MOOCs into Master's level courses was investigated. In the autumn semester of 2017, students enrolling in the Master of Communication and Media Studies' Web Technologies course were asked to attend an online MOOC course. Students were given the option of choosing from a vast list of over 35 MOOC courses that had been pre-selected by the lecturers so that their topics aligned with the course's

educational goals and were available online during the first academic semester. At the end of the course, all students were required to prepare a report about their online learning experience, focusing on integrating and recognizing MOOC activities in a typical Master's course context. Students who took the same online course were urged to present their experiences in class and discuss their issues together. The teachers were given a grade for their report and presentation on the topic. A questionnaire was completed anonymously by 27 students at the end of the semester, and interviews were conducted with students to authenticate their experience, identify the learning, and evaluate the research. The study concluded that this method of learning is novel, with only a few students have participated in a MOOC before and that the fact that they could choose what subject to learn, from where, and at their own pace, as well as the fact that they could learn at their own pace, proves that this method is effective.

Fondo and Konstantinidis (2018) created a MOOC on personal language learning settings to help people improve their digital language abilities. The objective was to show how the ADDIE model and connectivism may be combined to create personal language learning MOOCs. Two theoretical cornerstones guided the conception and development of the MOOC. It is led by the stages and procedures of the ADDIE instructional design paradigm, which provides the MOOC with the essential structure and organization. The preliminary findings of the pre-pilot study show that adapting the ADDIE model for MOOC design can be difficult because it is directed to everyone on the internet. For example, the collaborative environment produced in the course, as well as the assignments developed for that goal, caused language obstacles. Peer-to-peer assessment is limited when the audience is made up of people who are learning various languages. As a result, several of the assignments had to be redesigned before being implemented in the pre-pilot, and the pilot version of the course would require additional revisions.

Ismail et al. (2018) developed a massive MOOC for catering courses based on the ADDIE model. The goal of the project was to create an interactive learning environment for Food and Beverage Presentation disciplines based on the Vocational College curriculum. The study's population consisted of 155 Muar Vocational College Catering students, and the sample consisted of 60 third and fourth-year Diploma students. Purposive sampling was utilized as the sampling method, and the instrument used was a questionnaire. Statistical Packages for Social

Science version 23.0 was used to collect and analyze descriptive data. The data demonstrate that MOOCs can improve computer literacy (3.75), interest (3.78), and student learning styles (3.75) while also making the learning experience more enjoyable. Furthermore, the data demonstrate that using the MOOC application can assist students in enhancing their learning performance and achievement, and so can be used as an option to diversify the teaching and learning process in vocational colleges.

Lin and Cantoni (2018) looked at the early experiences of MOOC instructors as they went through the three stages of the innovation-decision process in the tourism and hospitality industry: decision, implementation, and confirmation. The three research questions that guided the research procedure were, why did instructors decide to use MOOCs in their professional careers? How did instructors execute the MOOC innovation? And after the MOOC has been implemented, how is the validation of MOOC decisions among instructors? Six instructors who taught tourism and hospitality MOOCs between 2008 and 2015 were interviewed in semi-structured interviews. Analysis was done using coding for interviews and an inductive approach was used to analyze the interview data. The results showed that: (1) Teachers' decisions to provide MOOCs were largely influenced by their institution's interest in MOOCs. (2) When trainers implemented MOOCs, patterns of action emerged, including six phases and cross-phase elements (preparation, design, development, launch, delivery, evaluation), and cross-phase support and training. (3) Most faculty chose to avoid risks in implementing MOOCs by moving away from innovative educational or learning activities such as peer review evaluations and collaboration. (4) Half of the teachers intended to repeat their educational experience in MOOC format in the future.

Lopez & Barra (2019) explored the Effectiveness of MOOCs for teachers in safe ICT use and training. The study examined the instructional effectiveness of courses in MOOC format for teacher training in the safe and responsible use of ICT by analyzing three different official courses. The courses were analyzed using three different methods: a questionnaire to measure participants' perceptions, pre-tests, and post-tests to measure the knowledge acquired, and LORI (Learning Object Review Instrument) to measure the quality of digital educational resources created by the participants. The results suggest that online courses in MOOC format are an effective way to train teachers in the safe and responsible use of ICT and that these

courses can enable the development of digital competence in the area of content creation. To determine the magnitude of the difference between the scores achieved by the participants in the post-test and the pre-test, the Cohen's *d* effect size was calculated. In all courses, it was found that the difference between post-test and pre-test scores was statistically significant with a large effect size. These results prove that the courses had a strong positive impact on the participants in terms of knowledge acquired regarding the safe and responsible use of ICT.

Uppal (2019) explored the Effectiveness of Massive Open Online Courses for Training Teachers in Higher Education. The purpose of this research was to find the impact of MOOCs on participant achievement, to find the participants' perceptions of their digital fluency, to investigate the impact of MOOCs on participants' perceptions of community building, to find out what participants think about MOOCs as a way to learn, to investigate the relationship between achievement and perceptions of their digital fluency, community building, and MOOC attitudes and to investigate the link between participants' attitudes toward MOOCs and their perceptions of community building. The study used a pre-experimental design with a single group post-test only approach to help achieve the study's goals. The study's population was made up of Indian higher education teachers. The study's sample size is 94 people. Achievement Tests, the Digital Fluency Perception Scale (DFPS), the Community Building Perception Scale (CBPS), and the MOOC Opinionnaire were all employed. Both descriptive and inferential data analyses were done using statistical techniques. As descriptive statistics, the mean and standard deviation were utilized. Population Mean's fiduciary boundaries have been established. To investigate the relationship between variables and test hypotheses, inferential statistics such as the *z*-test of single proportion and Pearson's Product Moment Correlation were used. Findings revealed that 95.74 per cent of participants scored 60 per cent or higher, hence MOOCs can be considered successful for training higher education professors. MOOCs are an effective medium for training or knowledge building for higher education teachers, according to the study. The MOOC participants thought they had a high level of digital fluency. This demonstrates that teachers in higher education believe they are prepared for the digital world of education. The MOOC was well-received by all of the teachers. As a result, MOOC preparedness has been created. MOOCs can be a viable answer for India's tremendous demand for ongoing and thorough on-the-job training for higher education teachers at a low cost and in a short amount of time. The current study also found that the

participants did not experience community formation as a result of the MOOC. The analysis of discussion forums reflected this as well. There was very little initiative in terms of beginning a conversation, providing reflections or suggestions, and so on. To support community formation in a MOOC context, well-planned and implemented discussion forum activities are required. Relationships between accomplishment and community building, digital fluency, and MOOC opinion were investigated during the research. There was no evidence of any link between them. It was concluded that participants' achievement is unaffected by their perceptions of their digital fluency, MOOCs, or community building.

Tzovla et al., (2021) conducted a study entitled, "Effectiveness of In-Service Elementary School Teacher Professional Development MOOC: An Experimental Research". The purpose of this study was to describe the design and implementation of a TPD-MOOC that uses digital educational content and Open Educational Resources to help in-service elementary school teachers improve their self-efficacy beliefs. The data were analyzed using SPSS version 23. The findings of prior research as well as the educational demands of the participants are taken into account in the design framework. An experimental design to compare teachers' self-efficacy beliefs before and after taking a TPD-MOOC was used. This course drew a total of 251 teachers, with 142 completing it. The improvement in instructors' self-efficacy beliefs and the effectiveness of the program were measured using quantitative data. TPD-MOOC boosted the self-efficacy views of in-service elementary school teachers in teaching biological concepts, according to the findings. The study also concluded that MOOCs are rated as an appropriate choice for teachers' professional development during the pandemic.

2.8.0 STUDIES CONDUCTED IN THE AREA OF TEACHING LEARNING OF RESEARCH METHODOLOGY

The researcher reviewed nine studies related to the teaching learning of Research Methodology. The reviewed studies are described below.

Lehti & Lehtinen (2005) conducted a study entitled, "Computer-supported Problem-based Learning in the Research Methodology Domain". The objective of this study was to determine the advantages and disadvantages of using computer-assisted simulation in the teaching and learning of experimental Research Methodology and statistics. The participants were 32

educational science university students. Three groups were developed to learn more about computer-supported simulation group effectiveness. This group was utilized as the first group. The second group, the article group, was given legitimate, case-based tasks based on real-world research. The third group, the statistics group, was instructed to use statistical computer software. Three research approach groups were compared in the study. The results demonstrate that there were significant differences in favour of the computer-supported simulation group, which used computer-assisted simulation. The computer-supported simulation group's interactions with two students were audiotaped throughout the semester. Although the computer-supported simulation group students outperformed the other students and improved during the course, the conversations examined revealed that their learning outcomes may be even better to satisfy the methodology and statistics curriculum's learning goals.

Aggarwal et al. (2011) compares online versus on-site training in Health Research Methodology. The main objective was to see if online courses in Biostatistics and Research Ethics might provide equivalent knowledge gains as traditional classroom-based courses. Volunteer Indian scientists were split into two groups at random. Students in group 1 took a 3.5-day on-site Biostatistics course and completed a 3.5-week online Research Ethics course. Students in group 2 took a 3.5-week online Biostatistics course and a 3.5-day on-site Research Ethics course. Learning objectives, course content, and knowledge exams were all the same for both course styles. Both groups ($n = 29$) had identical baseline characteristics. 3 months after the on-site course, the median knowledge score for Biostatistics went from 49 per cent to 64 per cent ($p = 0.001$), and 3 months after the online course, it increased from 48 per cent to 63 per cent ($p = 0.009$). The median score for the on-site Research Ethics course went from 69 per cent to 83 per cent ($p = 0.005$), while the median score for the online Research Ethics course increased from 62 per cent to 80 per cent ($p = 0.001$). For both Biostatistics and Research Ethics, three months after the course, median gains in knowledge scores remained equal for the on-site and online platforms. When compared to the baseline, the study found that knowledge improved instantly and 3 months following course completion. Biostatistics and Research Ethics knowledge improved significantly and similarly in both online and on-site training modes. This, combined with the logistical and financial benefits of online training, could make online courses particularly useful for developing health research capacity in resource-constrained countries.

Hardway & Stroud (2014) conducted a study entitled, “Using Student Choice to Increase Students' Knowledge of Research Methodology, Improve Their Attitudes toward Research, and Promote Acquisition of Professional Skills”. When compared to a traditional research techniques course, the study described here included a variety of student-driven, content-specific assignments that allowed for a more engaging learning experience. Incorporating an active learning strategy and building an environment that encourages students' intrinsic motivation for studying the content are two advantages of providing a range of student choices in the research technique curriculum. Students reported considerable improvements in skill development and knowledge of research methodologies after completing this course, as well as improved attitudes toward research. The relationships between pre-course student characteristics and post-course student characteristics imply that this type of teaching style was effective for a variety of students. These findings add to a growing body of evidence suggesting that students learn best when they are actively involved in the process and are most intrinsically motivated when they have control over their learning.

Tungprapa (2015) explored the effect of using the electronic mind map in the Educational Research Methodology course for Master-degree students in the Faculty of Education. The objective of the study was to use a quantitative and qualitative study to determine the results of employing an electronic mind map for teaching and learning in an educational Research Methodology course for Master's degree students at Ramkhamhaeng University in Thailand. One group of master's degree students was used in the research. An attitude evaluation pre-study and post-study form, a questionnaire, and an interview form are among the research materials. The fundamental statistics and the t-test were used to examine quantitative data, while the content analysis technique was used to assess qualitative data at the 0.05 level of statistical significance, the results of a quantitative study revealed that after using an electronic mind map, students' post-study attitudes about the research study subject were greater than their pre-study attitudes. Furthermore, the students believed that using a mind map is beneficial at the highest level. Meanwhile, the findings of a qualitative study revealed that students thought using a mind map in a research learning session was beneficial. Teachers' teaching and information transfer strategies, on the other hand, are still seen as a crucial component in improving students' understanding and cultivating favorable attitudes toward research.

Arantes & Rodrigues (2018) conducted a study entitled, “Combining Project-Based Learning and Community-Based Research in a Research Methodology Course: The Lessons Learned”. The Federal University of Sao Paulo, Brazil, offered a Research Methodology course to 22 first-year undergraduate students studying Administration. During the second semester of 2016, the course, which integrated community-based research and project-based learning, was designed. The students worked in groups to research a specific component of a non-profit organization that assisted individuals in need. The goal of this study was to look into the benefits and drawbacks of merging community-based research with project-based learning in research methods classes. A mixed-methods approach, analyzing the responses of students to a survey and focus group activities was used. The students had difficulty working in groups, scheduling meetings with community partners, and writing the articles, according to the findings. The pupil's learning was improved by using a project-based learning strategy. For the students, conducting community-based research was a rich and rewarding experience. The pupils' research skills were improved as a result of the course.

Daniel et al. (2018) conducted a study entitled, “Postgraduate Conception of Research Methodology: implications for Learning and Teaching”. The study's objective was to look into postgraduate students' perceptions of Research Methodology and how it affects their learning. It examines the aspects that are likely to influence a student's choice of research approach as well as the difficulties in comprehending research methodologies. The study was placed at research-intensive universities in New Zealand and Malaysia, both of which offer identical postgraduate programs. The students were enrolled in master's and doctoral programs. Participants agreed that Research Methodology is an important body of knowledge in postgraduate education, according to the findings. However, there were significant disagreements of opinion about what defines Research Methodology and whether it could be considered a discipline. To some participants, mastering research technique is less of a discipline and more of a collection of separate facts and abilities that may be acquired without necessarily gaining a deeper grasp of research. Participants said that formulating research questions, understanding theory or literature and its role in determining research conclusions, and issues with data processing are the most difficult aspects of learning research methods.

Varghese et al. (2019) conducted a study entitled, “Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students”. The objective of this study was to assess postgraduate dental students’ academic performance in a biostatistics and Research Methodology course in a master's program at a dental institution in India utilizing two teaching approaches (video-based learning and blended module-based learning). The students in this retrospective study were divided into two groups, each with a different year of admission: Group I in 2013-14 (n=80) and Group II in 2015-16 (n=80). Students in Group I was taught through video-based learning, while students in Group II were taught through a mixed module approach that included a small-group learning system called Process-Oriented Guided Inquiry Learning (POGIL). The final course evaluation (summative assessment) and formative assessment (during course assessments) of the two groups of students were compared. The student's final course evaluation was based on a written exam given at the end of the year, whilst formative assessment was documented through written examinations and projects given throughout the semester. In the end, there was no significant difference between Group I and Group II on the summative evaluation. There was a considerable difference in favor of Group II pupils on the formative assessment. This study discovered that post-graduate dentistry students performed similarly on the end-of-year exam using the two teaching and learning approaches for biostatistics and Research Methodology: video-based lectures and blended learning. The blended learning group, on the other hand, scored much higher on within-course exams. Probably, the inclusion of process-oriented guided inquiry learning and the construction of a small-group learning environment led to this conclusion.

Mekonnen (2020) Evaluated the Effectiveness of Learning by Doing Teaching Strategy in a Research Methodology Course, in Hargeisa, Somaliland. Between June and September 2018, 52 students registered for the research methods course at Edna Adan University, a privately owned teaching hospital. This was a cross-sectional quantitative study. The data was collected using purposeful sampling. As a result, only those who were accessible on the day of the collection were asked to participate in the self-administered interview. Following data collection, the frequency and percentage of each response are summed and presented as a bar chart, pie chart, or table. open-ended inquiries. The table also summarizes the prevalent themes revealed through thematic analysis for open-ended questions. Overall, the results of this study

show that the learning-by-doing strategy increases student engagement. As a result, 75% of respondents felt that learning by doing is effective in facilitating teaching-learning. More than half of the participants thought that receiving comments from instructors helped them enhance their research knowledge and skills. Furthermore, hands-on practice and a group project helped them gain confidence in their research writing abilities. Despite these advantages, pupils have noted certain difficulties. Some students, for example, reported that their lack of English language proficiency hampered their involvement in the group effort.

Rohilla (2021) conducted a study entitled, “Development of an educational program on data analysis techniques for M.Ed. Students through cooperative learning”. The main aim was to tell how effective the Educational Program was in teaching M.Ed. students' data analysis procedures through cooperative learning in terms of achievement and reactions. The experiment used a Pre-Test Post-Test Experimental Control Group design, with 33 students in the experimental group and 13 students in the control group as samples. As a tool, an achievement exam and a reaction scale were used. The experimental group's mean accomplishment score was significantly higher than the control group's mean achievement score. Students reacted positively to the cooperative environment setup while learning data analysis skills through a cooperative learning strategy, according to the study's findings.

2.9.0 MAJOR OBSERVATIONS FROM REVIEW OF RELATED LITERATURE

MOOC is an online course aimed at unlimited participation and open access via the web. The term was coined in 2008, reportedly by Dave Cormier of the University of Prince Edward Island, who wrote an article entitled “Massive Open Online Course Materials and Practice: a Canadian Perspective” for the Canadian Journal of Distance Education. Many universities now offer courses through MOOCs via their websites or platforms such as edX, Coursera, or Udacity. MOOCs are typically designed to be taken by anyone who is interested in the subject matter, and participation is open to people worldwide. MOOCs are often open-access or free of charge. This makes them accessible to a much larger audience than the typical college course, which may have limited enrolment and fees. In some cases, material from a MOOC may later be incorporated into a traditional class at the same institution. MOOCs are a great way to take education to the next level. They offer an intimate experience that one would not

get in a traditional university setting. The teachers are engaging and they can answer any questions that students have. This is because MOOCs are designed for students who want to learn more about a specific topic or skill, without having to worry about grades or classes. One can learn at their own pace, which is perfect for busy professionals who want to continue their education but also have a full-time job. In India, SWAYAM is a major centralized platform to deliver online courses. The researcher in the present study developed a MOOC on the subject of Research Methodology which is being taught in M.Ed. the first year to give them exposure to MOOC and also to expose students to a platform that helps them explore learning in an online course.

The researcher reviewed seventy studies in the area of MOOC and Research Methodology out of which, fifteen studies were conducted in India and fifty-five in abroad.

There were seven studies (Shaikh, 2017; Shigeta et al.,2017; Singh & Chauhan, 2017; Sivakumar, 2019; Ambedkar, 2020; Karthika, 2020; Subaveerapandiyan, 2020) that focused on the awareness of MOOC, out of which one study was done in abroad and six in India. All the studies reviewed focused on awareness of MOOC at the tertiary level where a survey was conducted and a questionnaire was used as a tool. Sivakumar (2019) concluded that the awareness of MOOCs/SWAYAM among Student Teachers was not adequate. Singh & Chauhan (2017) also found only basic knowledge of MOOC among teacher educators. Shaikh (2017) conducted a study to find the awareness of students pursuing a B.Ed. & M.Ed. and found that though the student teachers were aware only of the full form of MOOC all other details were unknown to them. Karthika (2020) found that science college students' MOOC Awareness is found to be better than that of Arts college students. Ambedkar (2020) found low awareness of SWAYAM MOOCs among Commerce students. Subaveerapandiyan (2020) explored awareness of SWAYAM as a MOOC among Information Science Students and found high awareness among students at one university. Shigeta et al. (2017) found low awareness among universities about MOOCs, but proper knowledge of OER. Singh & Chauhan (2017) emphasized developing a proper understanding of MOOC among teacher educators and also integrate MOOC in regular mode. Ambedkar (2020) urged students to explore MOOCs as a resource for learning. Subaveerapandiyan (2020) emphasized that MOOC supports lifelong learning and helps to gain knowledge irrespective of geographical boundary.

There were nine studies on the perception of students and teachers about MOOCs, out of which two were conducted in India and seven Abroad. Gamage et al. (2016) explored 22 MOOC courses as learners and found differences among the platforms in terms of their quality and high emphasis students on learning in networked culture. Ahmed et al. (2017) and Kilgore (2018) concluded that MOOCs inspire students and are very useful for students after graduation who cannot return to universities when being in jobs. Kilgore (2018) also emphasized MOOC offers an alternative platform for learning for students who are intrinsically motivated and like to work independently. It also offers confidence to students and motivates them to refresh their skills. Even Latha (2019) included 500 Indian Learners who have completed at least one MOOC course through Coursera, Edx, or Udacity MOOC platforms and found that students in post-graduation have a higher inclination toward studying through MOOCs, where the behavior is driven by internal rewards. Sukhbaatar et al. (2018) also explored undergraduates' and high school students' perceptions of MOOCs and found considered that students consider MOOCs as a learning resource and a worthy source of knowledge. Koukis & Jimoyiannis (2018) explored 326 language teacher views on MOOCs in secondary education schools and found that MOOCs promote professional development among teachers and a high inclination towards adopting such platforms in the future. Aljaraideh (2019) took a sample of 130 faculty members from all faculties at Jerash University and found their perceptions about MOOCs. The study concluded that teachers perceive MOOCs to provide better learning opportunities to students and recommended higher education institutes introduce MOOCs in their day-to-day learning. The study also pointed out certain difficulties in using MOOCs. Verma (2021) found the perception of participants, and instructors towards the effectiveness of the SWAYAM platform through a web-based survey and concluded that although Swayam is an affordable solution to increase the enrolment ratio still, Swayam is neither mobile-friendly, audio clarity is lacking, and has even had long videos not preferred by many students. Salas et al. (2022) studied 122 teachers from the National Autonomous University of Mexico's perception of MOOCs in the pandemic and found that MOOC is a viable solution to transform education.

There were three studies on factors that influence teachers and students to adopt MOOCs out of which two were conducted abroad (Hew & Cheung, 2014; Fianu et al.,2018) and one in India (Sharma,2018). The major factors to adopt MOOCs identified in these studies were

curiosity, personal reasons, certificates desire to explore something new, bridge their knowledge gaps, progress in their career, remain competitive in the workplace, and leverage the flexibility offered by MOOCs. The investigator reviewed three studies (Adams, 2014; King et al., 2018; Vezne, 2020) related to the experience of instructors and learners in using MOOCs. Vezne (2020) explored Teacher Candidate Satisfaction with Massive Open Online courses in Turkey and suggest that MOOCs have a positive impact on the personal growth and learning opportunities of teacher candidates, and they are satisfied with them. King et al. (2018) found the experiences of a group of Timorese English language teachers experience in MOOC and pointed out the benefits involved like encouraging teachers to discover new ways and improve their teaching techniques, as well as enhancing participants' English. Adams (2014) explored undergraduate students' experience of time using MOOCs and found that the end of lectures in MOOCs created an aura of sorrow among learners. The study found that students take different time to complete the course some wishing days and some wishing months but all had meaningful time spent studying the online courses.

The MOOC is based on a four-quadrant approach according to Swayam. In literature, there are also referred to as components. It includes assessments, video lectures, discussion forums, and additional learning materials or resources. Researchers have conducted studies on the single components like assessment (Admiraal et al., 2015; Chauhan & Goel, 2016; Ventista, 2018; Xiao et al., 2019) discussion forums (Onah et al., 2014; Chiu & Hew, 2018; Singh & Morch, 2018 and Ouyang et al., 2020) videos (Guo et al. 2014; Hibbert, 2014; Mor & Warburton 2016; Atapattu & Falkner, 2017 and Bonafini, 2017). Only one study on the MOOC quadrant was conducted in India (Chauhan & Goel, 2016) and that was on assessment. The authors listed features of quizzes in MOOC and prepared a checklist for two kinds of quizzes in MOOC which are independent and video-embedded quizzes. Admiraal et al. (2015) explored various assessment techniques used in MOOCs and criticized self-assessment as not an effective and reliable technique for assessment in MOOCs. Ventista (2018) on the other hand argued that self-evaluation was effective in formative assessment. Xiao et al. (2019) established a quality assurance framework in the subject of the hotel and tourist industries for assessing MOOC assessments. Onah et al. (2014) stated that MOOCs have low participants in the discussion forum and their overall use is low among the users. Chiu & Hew (2018) found out that viewing and commenting were the most explored activities in a discussion forum. The socially engaged

students contributed the most knowledge, while socially inactive students contributed the least. Ouyang et al. (2020) explored learner discussion perspectives, and preferences in a Chinese MOOC hosted on iCourse and found that socially engaged students contributed the most knowledge, while socially inactive students contributed the least.

Guo et al. (2014) measured students' engagement by how long they watched each video. A shorter video was found more engaging and a personal feel is necessary. The study also suggested splitting films into chunks shorter than six minutes and filming videos in less formal and low-budget studies. Hibbert (2014) and Mor & Warburton (2016) also explored the factors that make videos compelling and also emphasized the use of small chunks of video. Atapattu & Falkner (2017) carried out an in-depth examination of 1.5 million video exchanges from a Programming MOOC and found that long sentences should be avoided, vocabulary diversity and speaking rate should be reduced, causal connectives should be used more frequently, and content phrases should be used frequently in videos. Bonafini (2017) explored whether MOOC completion is linked to the number of posts and videos watched by participants and found that number of videos watched by participants had little bearing on the likelihood of completing a MOOC.

The literature reviewed on dropouts in MOOC was all conducted abroad (Onah et al., 2014; Rothkrantz, 2016; Bezerra & Silva, 2017; Aydin & Yazici, 2020; Goopio & Cheung, 2021). The major reason identified for dropping out of MOOC was because of a lack of connecting collaboration, a lack of peer student social supervision, an inability to manage the study, language problem, lack of maturity, not meeting expectations and a difficulty level of course. Onah et al. (2014) emphasized that students explore the course in their way and there exist diverse forms of engagement in MOOC. Rothkrantz (2016) compared the dropout rates of face-to-face courses and MOOCs and found a higher group in MOOCs as compared to face-to-face courses due to various reasons like lack of social interaction. Aydin & Yazici (2020) explored the elements that contributed to MOOC participants' non-completion of a University's MOOC Platform and found long videos, non-response of teachers or delay in response, and personal reasons. The study also recommended elements to improve the course like better course start and end dates, video quality, a more user-friendly interface, and greater variety in course

content. Goopio & Cheung (2021) conducted a review of journal articles to explore the MOOC dropout phenomenon and identified some learner-related elements.

The researcher reviewed twenty studies on the development and implementation of MOOC out of which two studies (Uppal,2019 and Pingle, 2017) were done in India and eighteen studies(Li et al.,2014; Najafi et al.,2014; Rubens, W.,2014; Griffiths et al.,2015; Israel,2015; Soffer & Cohen 2015; Tzovla et al., 2021; Goncalves et al.,2016; Janssen et al.,2016; Oakley et al.,2016; Perifanou et al.,2016; Orsini-Jones, 2017; Alturkistani et al., 2018; Andone & Mihaescu,2018; Fondo and Konstantinidis,2018; Ismail et al.,2018; Lin and Cantoni,2018; and Lopez & Barra, 2019) in abroad. All the studies reviewed were conducted at the tertiary level and only one study was at the school level. Uppal (2019) and Inchiparamban (2017) conducted a study on Teacher Education for teacher educators and B.Ed. students respectively, and concluded that MOOCs are effective in improving knowledge and awareness. Najafi et al. (2014) integrated MOOC in a school-based course and comparison between MOOC-only students with no teacher support, and blended mode students with weekly tutorials and found high scores of MOOC only students on the MOOC test on the platform although low scores on achievement test. The study suggested to MOOCs can be integrated into school-based courses in a self-study format. The study recommended making a school-based platform to deliver MOOC because in the future the supplier platform can be lost or deleted. Griffiths et al. (2015) also blended MOOC in a university course, then compared it to face-to-face mode and found that differences between students in hybrid sections and those in traditionally taught sections were not statistically significant. Although the author found that blending MOOC in the classroom exposes students to a unique style of teaching and exposes student methods to learning online. Andone & Mihaescu (2018) blended MOOCs and found it a novel method that promotes self-paced learning. Israel (2015) also reviewed the MOOCs hosted on Udemy, Coursera, etc being integrated into the traditional classroom and gave 4 different models and concluded that MOOCs have the power to provide an excellent resource to students, although integrating them with regular courses is full of challenges. Soffer & Cohen (2015) integrated MOOC at the undergraduate level and listed various benefits like a flexible environment and the development of 21st-century skills. Even a study by Goncalves et al. (2016) aimed to clarify the role MOOCs can play in teacher education, as well as to learn about teachers' perceptions of their progress after creating and implementing their own and found MOOC as an effective

solution for 21st-century learners. Janssen et al. (2016) emphasized the roles of teachers in the design, and the development of MOOCs is of utmost importance. Oakley et al. (2016) listed the factors that create a highly liked MOOC which included easy materials, convenient time, practical examples in the course, and many more. Perifanou et al. (2016) focussed on selecting platforms that provide various assessment opportunities to users and emphasized having a collaborative team to make a MOOC. Alturkistani et al. (2018) found that MOOCs with proper assistance and resources promote learning in skill-based courses. Fondo and Konstantinidis (2018) developed a MOOC using the ADDIE model and concluded its difficult as its MOOCs are directed to everyone on the internet. Ismail et al. (2018) developed a MOOC in vocational colleges and concluded that the knowledge and performance of students can enhance. A study by Lopez & Barra (2019) emphasized that MOOCs enhance digital competence in the area of content creation. Lin and Cantoni (2018) interviewed teachers using MOOCs in tourism and hospitality and found 6 phases in its development i.e., preparation, design, development, launch, delivery, and evaluation. Also, teachers were intending to develop MOOCs in the future. Li et al. (2014) listed principles for the effective design of MOOC which included Learner-centered, condensed course content, effective media integration with curriculum, and a focus on social construction. Rubens, W. (2014) listed several pedagogical needs through personal experience which included activities that help the student to share their knowledge and instructor intervention to support learners if necessary.

Research Methodology is a subject taught at either graduation or post-graduation level or both. The main aim of the subject is to develop knowledge and understanding of research methods in various fields and also to develop scientific thinking and promote research. Moreover, postgraduate students have no choice as a dissertation is a requirement for a degree. The research reviewed nine studies related to teaching methods used to teach Research Methodology and student perceptions about the course, out of which six were abroad (Lehti & Lehtinen,2005; Hardway & Stroud,2014; Tungprapa,2015; Arantes & Rodrigues,2018; Daniel et al., 2018) and three in India (Aggarwal et al.,2011; Varghese et al., 2019; Mekonnen,2020 and Rohilla,2020). Daniel et al. (2018) and Arantes & Rodrigues (2018) found that students looked upon Research Methodology as an important course.The study emphasized the Research Methodology course nature as a collection of facts and less of a discipline. Difficult elements of the Research Methodology course were also identified. Lehti & Lehtinen (2005)

explored computer-assisted simulation in science students and found it effective. Aggarwal et al. (2011) compared online and offline teaching in health Research Methodology courses and found that median gains in knowledge scores remained equal for both on-site and online platforms. Even Varghese et al. (2019) conducted a study on Postgraduate Dental Students in Biostatistics and Research Methodology using a mixed module approach that included a small-group learning system called Process-Oriented Guided Inquiry Learning (POGIL) and video-based learning. The blended learning group scored higher in course exams. Rohilla (2020) and Tungprapa (2015) explored cooperative learning strategy and electronic mind map to teach Research Methodology courses in Teacher Education and found positive reactions from students towards both approaches. Hardway & Stroud (2014) emphasized that students learn best when they are actively involved in the process and are most intrinsically motivated when they have control over their learning. Arantes & Rodrigues (2018) combined Project-Based Learning and Community-Based Research in a Research Methodology Course at the undergraduate level and found that students learning improved by using a project-based learning strategy. Mekonnen (2020) implemented learning by doing in Research Methodology Course and found that respondents felt learning by doing is effective in facilitating teaching-learning.

2.10.0 IMPLICATIONS OF THE REVIEW OF RELATED LITERATURE FOR THE PRESENT STUDY

A review of related literature focusing on various aspects of MOOC was done to get knowledge on previous studies done so far in this area. The researcher reviewed a total of seventy studies, out of which fifteen studies were conducted in India and fifty-five in abroad . The studies were related to awareness of MOOC, perception of MOOC, motivation to adopt MOOC, quadrants of MOOC, design, development & implementation of MOOC and teaching-learning of Research Methodology. The researches reviewed have the following implication for the present studies.

- MOOCs are generally courses with the facility or capacity to enroll a large number of users and minimum instructors' interference and support.
- MOOCs promote self-paced and flexible learning.

- MOOCs are a technological alternative to transforming learning for students. It has benefits like a flexible environment and the development of 21st-century skills.
- Awareness about MOOC and its uses among art students in general and Teachers Education in particular, is moderate to low.
- There is a dire need to design, integrate and promote MOOCs in regular classroom practices and promote the use of MOOCs for teacher education in India.
- MOOCs are found to be more effective in a learner who is intrinsically motivated, mature, and likes to do independent work.
- Students in post-graduation have a higher bend towards the usage of MOOCs.
- Students are more actively involved in the learning process when they have control over their learning.
- Although a few studies have been done abroad, there is a dearth of studies on the development and implementation of MOOCs in India. Only two studies were found by the researcher on the development of MOOC in India, one on Teacher Educators and one on B.Ed. students.
- Students in the sciences stream are more familiar with MOOCs than those in the Arts stream. There is a need to encourage students to use MOOCs as a learning resource because it has been shown that students in Commerce and Arts institutions have a low awareness of SWAYAM MOOCs.
- There is a dearth of studies where MOOC has been developed by the instructor. In most cases, the MOOC is adopted from commercial platforms and implemented in the classroom in stand-alone or blended forms and effectiveness is observed.
- An effective MOOC should be learner-centered, flexible in duration, have easy materials, and be added with practical day-to-day life experiences.
- The major factors for adopting MOOCs identified in these studies were curiosity, personal reasons, getting certificates, desire to explore something new, bridge their knowledge gaps, progress in their career, remain competitive in the workplace and leverage the flexibility offered by MOOCs
- Institutions should adopt platforms that support various forms of assessment like self, peer, and automatic assessment.

- MOOCs have a positive impact on the personal growth and learning opportunities of learners and they are satisfied with them.
- Drop out in MOOCs is inevitable and there exist various forms of learner engagement in MOOCs. Even if students don't complete the course contents, they still have explored some components after their registration on the platform.
- The major reason for students not completing the course is nonresponsive to instructors, delay in response, long videos, and personal reasons.
- Institutions should develop their own MOOC platform and degree course-specific MOOC on it so that even if commercial platforms are taken down, they still have their courses running.
- MOOCs are effective when videos are divided into chunks or small segments of eight to ten minutes. Shorter videos were found more engaging.
- MOOCs are found to be very effective in skill-based courses.
- Although blended learning, project-based learning, video-based learning and mind maps have been explored to teach Research Methodology, the researcher was unable to find any study where MOOC was used to teach Research Methodology.

The purpose of the review of the literature was to find the studies already done and also to find the research gaps. A review of research in the present study also helped the researcher with the points that need to be kept in mind while designing and developing a MOOC. Much of the research done in past are focusing on integrating a MOOC already developed and hosted on commercial platforms and finding its effectiveness by implementing it in the traditional classroom. Not much emphasis is done to develop and implement a MOOC and find it effective among learners in India. After reviewing 70 studies, the researcher concluded that although MOOC has been explored in Teacher Education none of the studies has been done on developing a MOOC for M.Ed. students or student teacher educators. In addition to this, the researcher was unable to find a study wherein a MOOC on Research Methodology has been developed and implemented at the post-graduation level. Hence, the present study was an attempt in this direction to develop and implement a MOOC in Research Methodology for Student-Teacher Educators and find its effectiveness. For this purpose, the researcher had developed a MOOC on selected topics of Research Methodology taught in M.Ed.