CHAPTER III

RESEARCH METHODOLOGY

3.0.0 INTRODUCTION

This chapter briefly describes the methodology followed in the present study. A Research Methodology is a description of how a particular study is conducted. It is defined as a method for gathering data using various tools, interpreting the data, and deriving conclusions from the findings. As a result, Research Methodology refers to how a researcher designs their study to achieve accurate and consistent data while also meeting their research objectives. This chapter describes the population of the study, the variable used, the tools developed to collect the data, the development process of the MOOC, the phases followed in collecting the data, and the techniques used to analyse the data.

3.1.0 RESEARCH DESIGN

Research design is a blueprint prepared by research for giving direction to the entire research study. The present study was quantitative and an experimental study was adopted. The research design used was quasi-experimental. In this design, an experimental procedure is applied but all extraneous variables are not controlled (Christensen et al., 2014). Here manipulation of the independent variable was carried out but there was no random assignment of individuals to the control and experimental group. As the quasi-experimental has various designs under it, a pre-test post-test non-equivalent comparison group design was adopted. The design of the present study is diagrammatically represented as follows:

Experimental group	O1	X	O2
Control group	O3	C	O4

Where, O1 and O3 are Pre-tests
X – experimental group
C- control group
O2 and O4 are Post tests

Here two groups were selected conveniently by the researcher, wherein one group was assigned to the control group and one to the experimental group. Both the groups selected

were non-equivalent (as the name of the design suggests) and to make them equivalent on the dependent variable the pretesting was carried out. Pre-testing in a non-equivalent group design is of utmost importance because it will determine how the groups are compared initially. Based on the pre-test, both groups are made equivalent. Matching is one of several strategies for equating participants across one or more variables. Thereafter implementation of the MOOC was carried out in the experimental group. At the end of the implementation procedure, the post-test was executed on both groups. Post-test scores were used to find out how much effective the MOOC was in enhancing the achievement of the student in the subject of Research Methodology.

3.2.0 VARIABLE IN THE STUDY

A variable refers to a person, place, thing, or phenomenon that is being measured in a study. As the name suggests variable is an attribute whose values keep on changing. The two variables taken into consideration in this study were as below:

3.2.1 Independent variable

In experimental study the independent variable is manipulated by the researcher and its effect on the dependent variable is measured. Here Massive Open Online Course developed in Research Methodology was the independent variable. This independent variable was implemented on the experimental group and its effect on the achievement and reaction of the experimental group was evaluated.

3.2.2 Dependent variable

In experimental research, dependent variables are those variables whose values change when the independent variable acts upon them. In the present study, the achievement in Research Methodology of Student Teachers Educators was one dependent variable, and reactions & experiences of Student Teachers Educators towards the implemented MOOC was another variable.

3.3.0 POPULATION OF THE STUDY

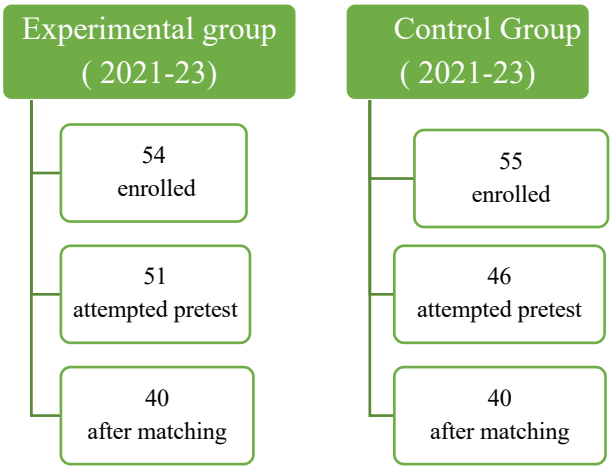
The population consists of all those items, objects, or things which are having certain characteristics common in all and are of interest to the researcher. In the present study population comprised of all the Student Teacher Educators studying in the two-year M.Ed.

program in India in the academic year 2021-2023. According to the 26th annual report published by NCTE, India in 2020-21, the total number of M.Ed. Courses recognized as on 31st March 2021 were 1274. In the eastern zone, there were 83 institutions, in the western zone 368, in the northern zone 463, and the southern zone 360. The total intake in M.Ed. approved as on 31st March 2021 was 62,845 students.

3.3.1 SAMPLE OF THE STUDY

A sample is the subset of the population and is selected by the researcher through the sampling process. For the present study sampling process adopted was convenience sampling based on the permission granted by the institution for conducting the research and implementing the Massive Open Online Course. From 2015, the M.Ed. program had two years of duration instead of one year. Hence many M.Ed. colleges started facing difficulties in getting sufficient enrolment (Rohilla, 2020). Hence two institutions from Gujarat state with sufficient enrolment were chosen conveniently to conduct the research i.e. Department of Education, Faculty of Education and Psychology, The Maharaja Sayajirao University of Baroda, Vadodara, and Kameshwar College of Education, affiliated to Gujarat University situated in Ahmedabad. The only factor for choosing both institutions was the convenience of the researcher to be able to get access to the Student Teacher Educators and get permission and full support of the authority to collect data. All the Student Teacher Educators studying in the Department of Education, Faculty of Education and Psychology, The Maharaja Sayajirao University of Baroda in the batch of 2021-2023 were selected as experimental group and all the Student Teacher Educators studying in the batch of 2021-2023 in Kameshwar College of Education, Ahmedabad were selected as the control group. There were 54 and 55 Student Teacher Educators in the experimental and control groups respectively. The pre-test was attempted by 51 Student Teacher Educators of the Experimental group and 46 Student Teacher Educators of the control group. Based on the results of the pre-test matching was carried out and both the group were made equivalent consisting of 40 Student Teacher Educators each in both groups. So the sample consisted of 80 Student Teacher Educators studying in the M.Ed. program, 40 in each of the control and experimental group. Student Teacher Educators of the Experimental group were taught through Massive Open Online Course and Student Teacher Educators of the Control group were taught through the conventional method by their teacher.

Figure 3.1: *Sample for the study*



3.4.0 PHASES OF THE STUDY

Starting from the development of the Massive Open Online Course and the tools to the analysis of the data different phases were involved as follows:

3.4.1 Phase 1-Development of MOOC and tools for data collection

Development of the Massive Open Online Course was the first and foremost phase involved. Here various steps for the development of MOOC were carried out, tools for data collection including achievement tests for pre and post-test, a five-point Likert type scale to get reactions of the Student Teacher Educators towards the developed Massive Open Online Course, a and post-experimental interview schedule was developed. Development of the Massive Open Online Course is described in section 3.6.0 and details regarding the achievement test, reaction scale, and post-test experimental schedule is described in section 3.5.0 respectively.

3.4.2 Phase 2-Implementation of the MOOC

Before the implementation of the MOOC and the tools permission was taken from the concerned authority in both the institutes of control and the experimental group. Then pre-test was conducted on both the experimental and control group and matching was carried out. Then MOOC was implemented in the experimental group. After the achievement test was implemented on both the control and experimental group, the reaction scale along with the interview schedule was implemented on the experimental group. Details of the implementation phase are described in section 3.19.2.

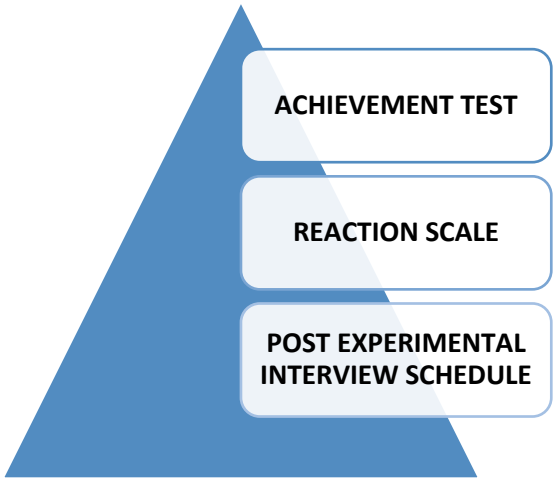
3.4.3 Phase 3-Data Analysis

After the collection of the data, descriptive statistics were carried out on the post-test achievement score of both the control and experimental group. Then hypothesis was tested using the Mann-Whitney U test and the reaction scale was analysed using frequency, percentage, and intensity index. The data collected through post-experimental interviews were analysed using content analysis.

3.5.0 TOOLS FOR DATA COLLECTION

To achieve objectives three, four, and five of the study three tools were prepared by the researcher which included an achievement test, reaction scale, and a post-experimental interview schedule respectively. Detailed steps involved in the development of these tools are described below.

Figure 3.2: *Tools for data collection*



3.5.1 ACHIEVEMENT TEST

An achievement test in Research Methodology was constructed by the researcher. The same achievement test was used both in pre-testing and post-testing (i.e. before and after the implementation of the developed MOOC) of the control and experimental group. It was prepared in both English and Gujarati language. The achievement test was constructed keeping the topics to be taught through MOOC in mind. So the achievement test comprised questions relating to three broad topics of Research Methodology constituting of Introduction to Educational Research, types of Research Methods, and Sampling in Educational Research. Before constructing the achievement test in Research Methodology

a blueprint was prepared by the researcher. The achievement test consisted of 50 multiple-choice questions and was 50 minutes in duration. The achievement test was prepared using multiple choice question options in Google form. The question prepared by the researcher took into consideration all three levels of the cognitive domain i.e. Knowledge, understanding, and application. The items in the test were divided uniformly among all three broad topics. The developed achievement test was validated by the subjects and language experts. All suggestions and comments were incorporated into the final achievement test. To determine the reliability, the Internal consistency of the achievement test was calculated using Kuder Richardson formula 20 (Kuder and Richardson, 1937). This type of reliability is used for items that are scored dichotomously i.e. yes and no type question or multiple choice questions. The test was implemented on 30 Student Teacher Educators and KR 20 reliability coefficient was found to be 0.9, which indicates a high level of reliability. The constructed achievement test is attached in Appendix II.

3.5.2 REACTION SCALE

To achieve objective three of the experimental study a Likert-type five-point reaction scale was prepared by the researcher. This reaction scale was prepared using a linear scale in Google form. The scale had 35 statements related to the developed Massive Open Online Course and items pertaining to its videos, discussion forums, assessments and additional resources, overall planning, feasibility, etc. The reaction of the participants was collected on a five-point scale with scale points like strongly agree, agree, undecided, disagree, and strongly disagree. There were instructions on the top of the scale for Student Teacher Educators to put click on the indicators on the scale which is most appropriate for them for each statement. The developed achievement test was validated by the experts. All the suggestions and comments obtained were incorporated into the reaction scale, and the final reaction scale was prepared and ready to use. The reaction scale is attached in Appendix III.

3.5.3 POST EXPERIMENTAL INTERVIEW SCHEDULE

According to Christensen et al., (2014), “an interview with the participant following completion of the experiment, during which all aspects of the experiment are explained and the participant is allowed to comment on the study”. Consequently, after the experiment was over and the reaction scale and achievement test were administered to the experimental group. The researcher randomly selected twelve Student Teacher Educators from the

experimental group to conduct the interview. The research had prepared an interview schedule of 23 open-ended and close-ended questions which included, general information about the participants, overall experience with the MOOC, the challenges faced in any of the quadrants during the implementation process, suggestions on improvement of the Course as well as suggestion for future MOOC developers and learners. The interview schedule is attached in Appendix IV.

3.6.0 DEVELOPMENT OF MOOC

MOOCs are online Course with the capacity to enrol unlimited Student Teacher Educators , open to all, and consists of components like video lessons, assessments, discussion forums, and additional resources in the form of pdf documents, badges, certificates, and also a platform to host the Course. The investigator developed the MOOC along with its different quadrants and platform to host the MOOC.

3.6.1 SELF ENROLLMENT IN MOOC

As the researcher was not from a technical background it was essential to experience a MOOC before designing and developing one. Hence the researcher enrolled in many MOOCs for getting trained in the process of developing a MOOC. The details of the program and courses attended by the researcher are given in Appendix V.

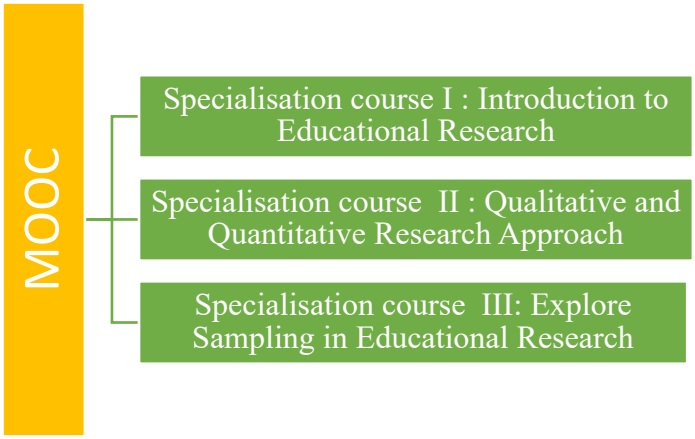
3.6.2 SELECTION AND ANALYSIS OF CONTENT

The researcher analysed the curriculum of M.Ed. of the Department of Education, Faculty of Education and Psychology, The Maharaja Sayajirao University of Baroda, Vadodara, and Kameshwar College of Education, affiliated with Gujarat University situated in Ahmedabad. The topics taught in Research Methodology in the first year of M.Ed. were reviewed and three broad topics common to both the institution comprising of Introduction of Education Research, Qualitative and Quantitative Research approach, and Sampling in Educational Research were selected to teach through MOOC. These three broad topics were then divided into three different Specialisation MOOCs which had a common quadrant in all of them consisting of video lessons, assessments, discussion forums, and additional resources. The broad learning objective of the MOOC was also framed.

3.6.3 SPECIALISATION IN MOOC

The content selected for MOOC was divided into three Specialisations Courses. Each Specialisation Course was of three weeks duration and Student Teacher Educators had to complete one Specialisation Course to move to the next Course. Here drip content method was followed where in the Course content were gradually released and the Student Teacher Educators had to complete the Course I to move to the Course II. The specialisation course II materials were released to learners after a scheduled period of three weeks, rather than giving them access to the entire Course all at once. Similarly, Student Teacher Educators had to complete the Course II to move to Course III. The Specialisation Course I dealt with Introduction to Educational Research, the second section dealt with Qualitative and Quantitative Research Approach and Specialisation Course III was comprised of Explore Sampling in Educational Research. The topics covered in each of the three Specialisation Courses are given below.

Figure 3.3: *Specialisation in MOOC*



The details and outline of topics covered in each Specialisation Course are given in Appendix VI. In all three Specialisation Courses, the components used to develop the Course were the same i.e. each of the specializations consisted of video lessons, assessments, discussion forums, and additional resources.

3.7.0 Selecting a Content Management System

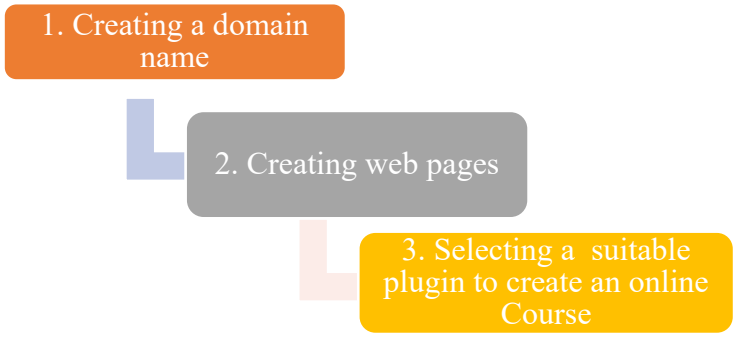
To host a MOOC and upload all its content, a platform or a website is required which is called a Content Management System(CMS).CMS is a beneficial software that helps to develop a website by providing the necessary tools for creating the e-content and

infrastructure for delivering it. The system can be extended and personalized using various plugins. On the web, many platforms offer CMS to the general website which are ordinary websites that can run entire organizations. The most well-known platform used is WordPress. It can be used to run an LMS (Learner Management System) which later allows the creator to create and run an online Course. The researcher decided to use WordPress because of its features like Ownership and authority, ease of use, free of cost, user friendly, easy customization, search engine friendly, safety and security, and its ability to handle different media types (Zúbrik,2015). The next step was the provide a domain name unique to the website so that it is searchable on search engines like Google.

3.8.0 Steps to develop website using WordPress

WordPress as Content Management System was selected by the researcher. Then the steps mentioned below were taken into consideration to develop the website on WordPress :

Figure 3.4: *Steps to Create a Website using WordPress*



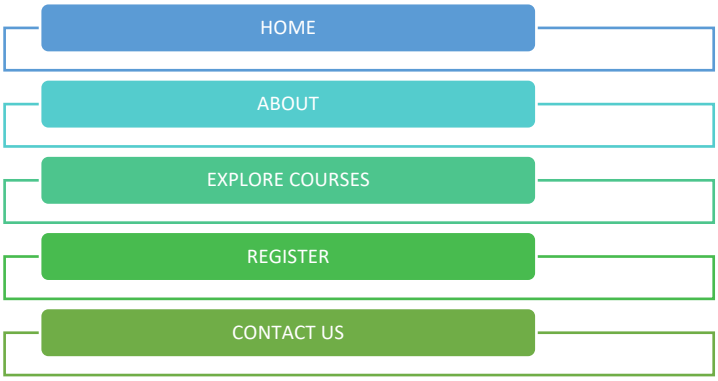
3.8.1 Creating a domain name

Once the CMS was decided as WordPress and the website was designed, there was a need to give a domain name to the website. A domain name is a website's equivalent to a physical address. For the users to reach to the website a domain name is necessary. The domain name selected should be simple, related to the content of the website, should not have spellings error, unique name not be used by others, and should reflect the developers' identity or brand. Keeping the following characteristic in mind the researcher decided to keep the name of the website as a techtor.in. Here the word Techtor is made up of two words "tech" which stands for technology and "tor" which is used for a mentor. The website was being used for developing MOOC which has the instructor as a mentor and all components make use of technology for its delivery.

3.8.2 Creating web pages on WordPress

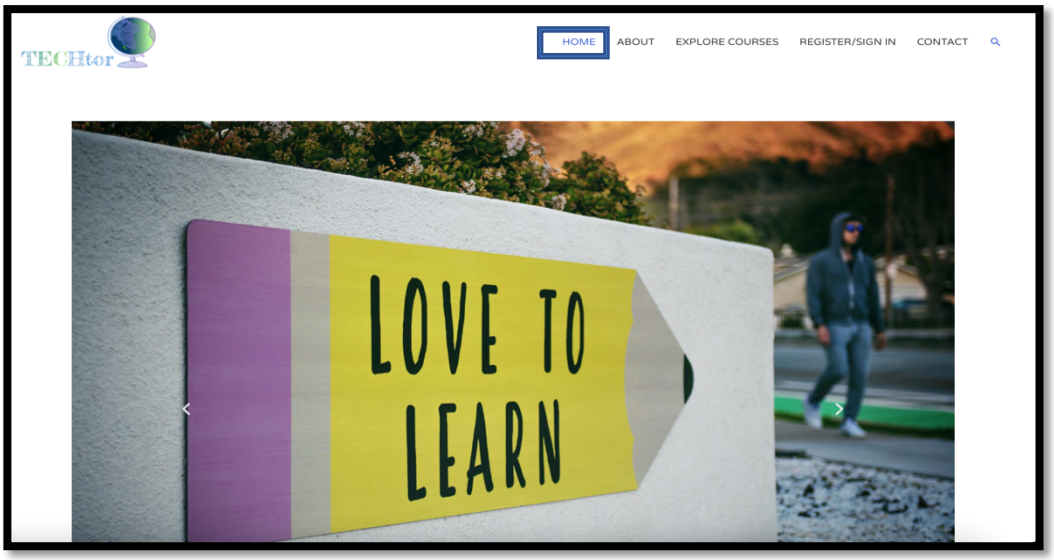
To organize the content, and make it easier for the user to find the content, the website is divided into different web pages. Here the researcher developed five pages which included Home, About, Explore Courses, Register and Contact us. Adding the extra web pages gives a professional look to the website and also informs users of the website about the creator and purpose of creating the website.

Figure 3.5: *Web pages on the techtor.in website*



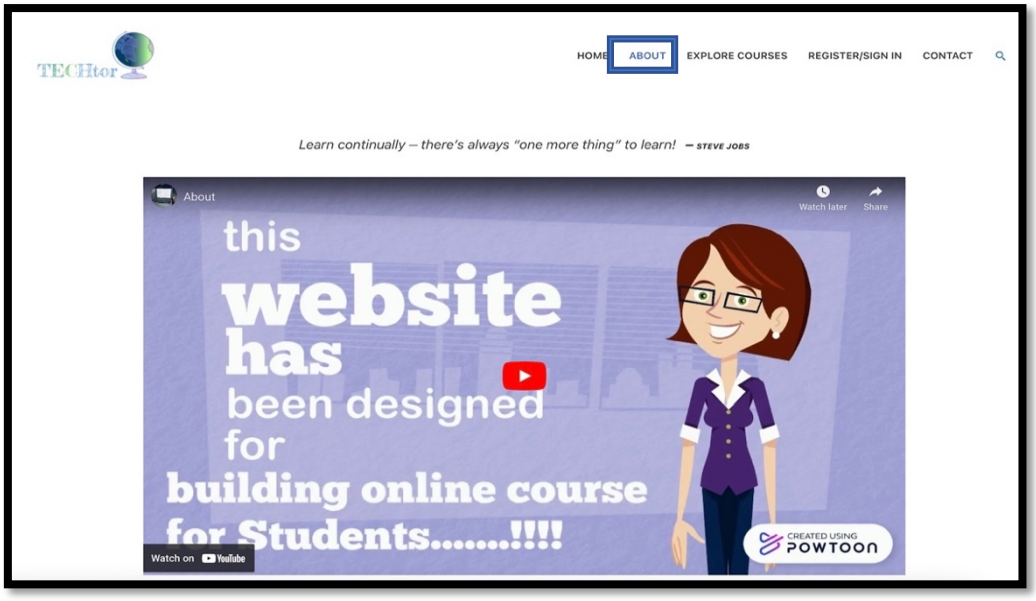
- **Home page**: This page is the face of the website. It is also called a front page and it's the first page the users see when they visit the website. This page gives a small review of what the website is all about and what are its features. The researcher had written a brief overview of what is MOOC on this page.

Figure 3.6: *Home page of MOOC platform*



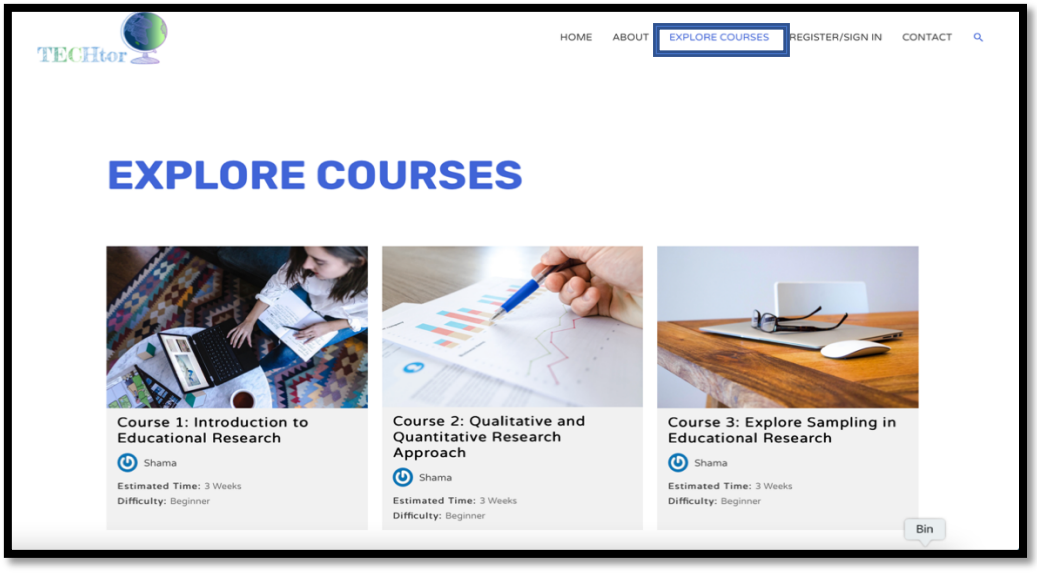
- **About**: The purpose of this page was to give a brief introduction about the instructor i.e. the researcher and also the intentions and purpose behind making the website. The researcher included links to the social media accounts so that Student Teacher Educators could easily reach out in case of difficulty.

Figure 3.7: *About page of MOOC platform*



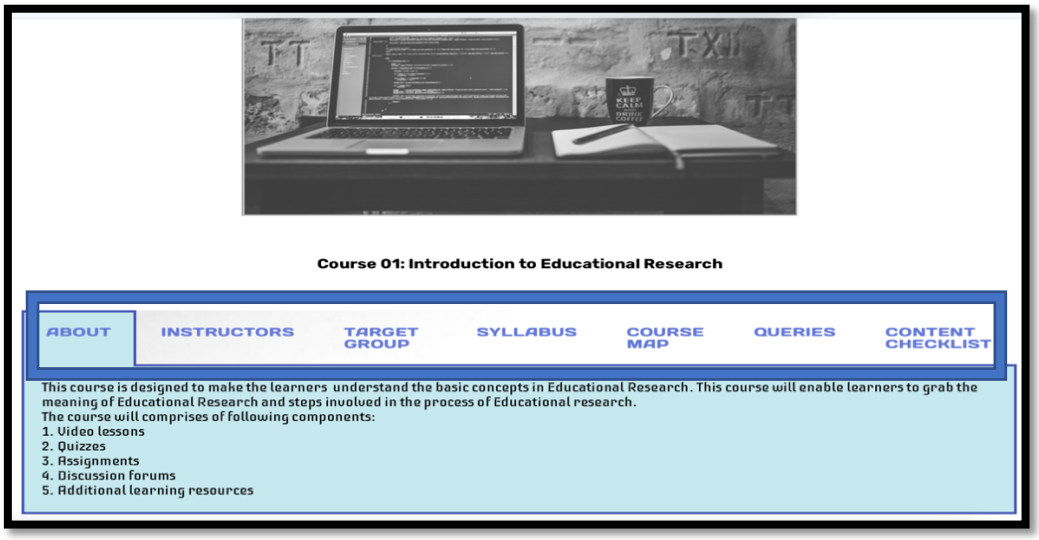
- **Explore Courses**: The main intention of this page was to give a snapshot of all the Course which is available for learners to register. All the new courses in the future will also be updated and visible to all on this webpage.

Figure 3.8: *Explore Courses of the MOOC platform*



Inside the Explore pages there is the Home Page of each Course which consists of the following details:

Figure 3.9: *Home Page of Course I*

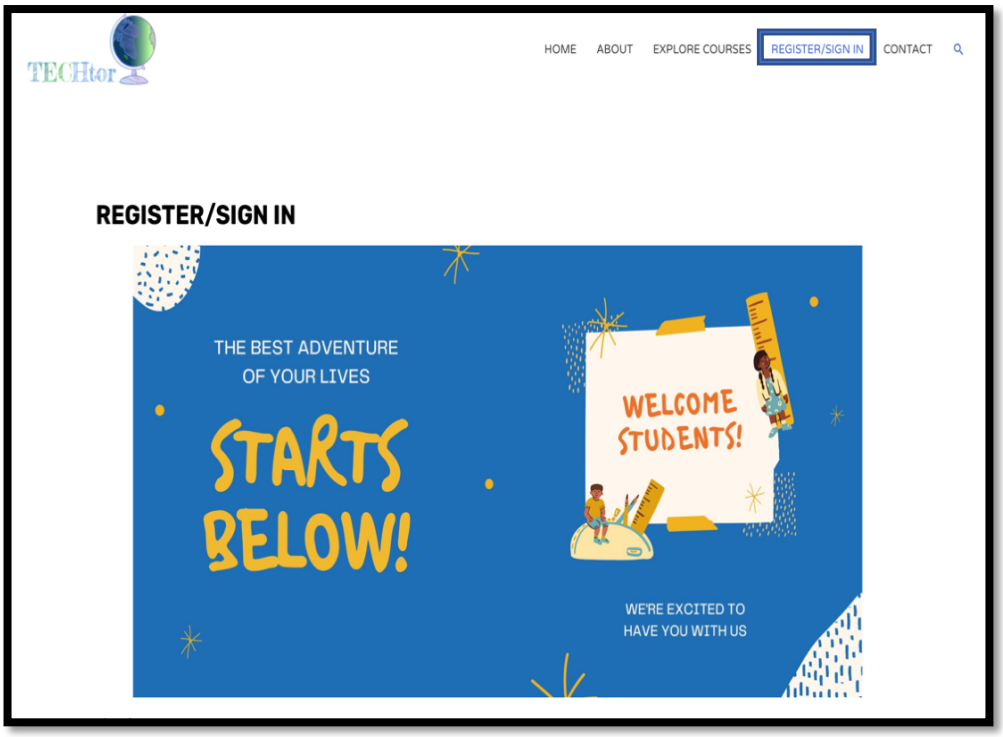


1. About the Specialisation: This mainly comprised information about the details of the Course and its quadrants.
2. Instructors: Details about the instructors of the Course with their brief biodata.
3. Target group: Here the details about the target audience are displayed. The prerequisite for the Course if any is also updated here.
4. Syllabus: The syllabus of the Course was uploaded here which comprised the Medium of instruction, Course objectives, and details about the topics being covered. The syllabus of all three courses is attached in Appendix VII.
5. Course map: The arrangement of lessons in the Course is presented in a mind map format for easy visualization for Student Teacher Educators . The course map of all three courses is attached in Appendix VIII.
6. Queries: If Student Teacher Educators had any kind of queries they were able to post in this forum.
7. Content checklist: It contained a pdf document that listed all the lessons, with a check box in front of the name of the lesson, it was in a downloadable format. So Student Teacher Educators would tick mark the lesson which they have completed. It helps Student Teacher Educators to keep track of the lesson that

they have completed**.** The content checklist of all three courses is attached in Appendix IX.

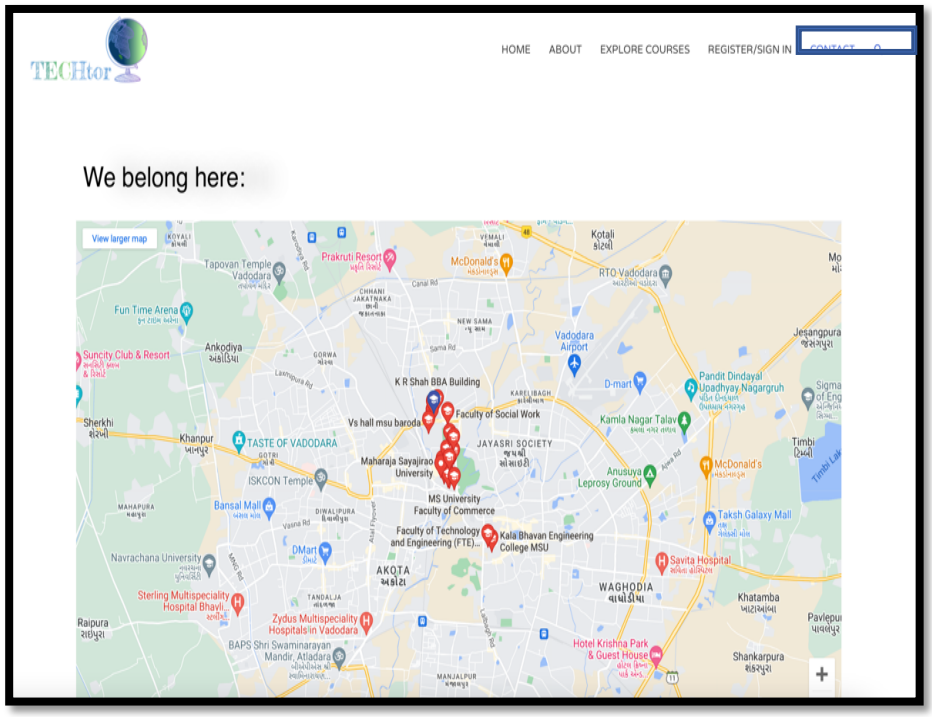
- **Register/Sign in**: This page was necessary for letting the visitor register themselves by proving simple details like name, email, phone etc. This helps in keeping track of visitors on the website and also lets the visitors of the website enrol in Courses developed on the platform. All the Student Teacher Educators who visited the website for the first time had to click on the register options. For all the returning Student Teacher Educators already registered on the website they had to use the options of Sign in. Only those registered on the website were able to see the contents of the website, no other user online could use the platform to access the course.

Figure 3.10*: Register/Sign in page of MOOC platform*



- **Contact us**: This page gave information about the location of the author of the website and also the necessary email id in case the visitors of the website have some query or difficulty in using the website.

Figure 3.11: *Contact page of MOOC platform*



Once the web pages were created and the website was ready to use, the researcher decided to find a suitable Learning Management System(LMS) plugin to install on the website. This plugin helped in developing the Massive Open Online Courses and uploading all its contents.

3.9.0 Selection of an LMS plugin

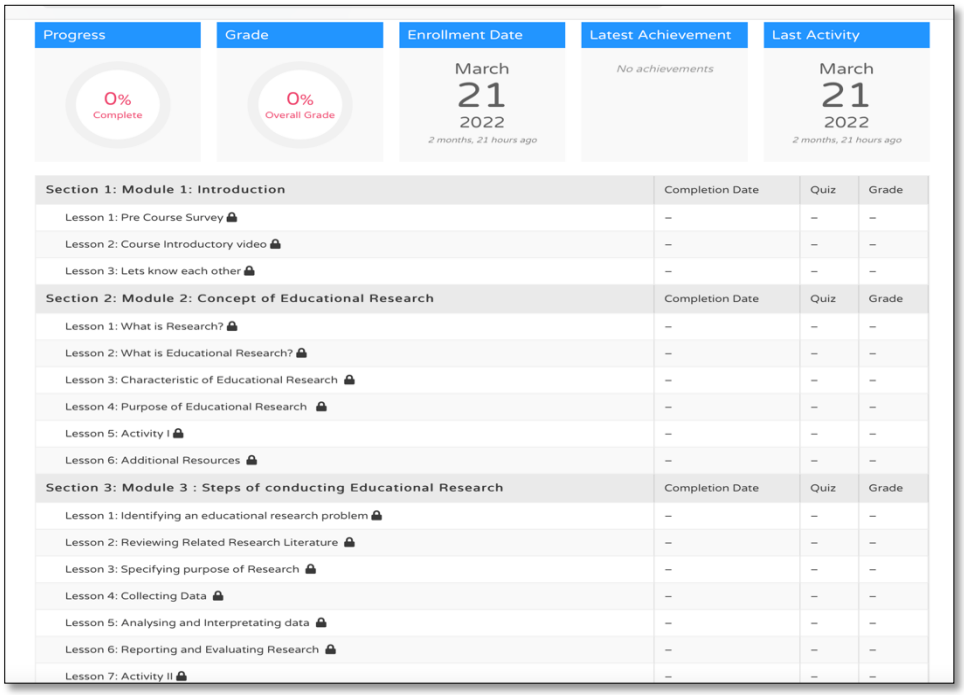
A plugin is a software that enhances or adds additional features to the WordPress site. LIFTERLMS is a useful plugin for creating online Courses of various kinds. It is simple to integrate into an existing WordPress site. In the present study, the researcher integrated the LIFTERLMS plugin into the techtor.in website developed using WordPress. This plugin had all the following features mentioned below, essential to build a Massive Open Online Course:

- *Course Builder*: This unique functionality helps the Course developer and instructor to upload all e-content(quadrants) designed for making the MOOC.
- *Personalized email*: When any user enrolls in the Course, a personalized email was sent to the Student Teacher Educators to welcome them to the Course. E-

mail was also sent when a student completed the Course to congratulate them on their achievement.

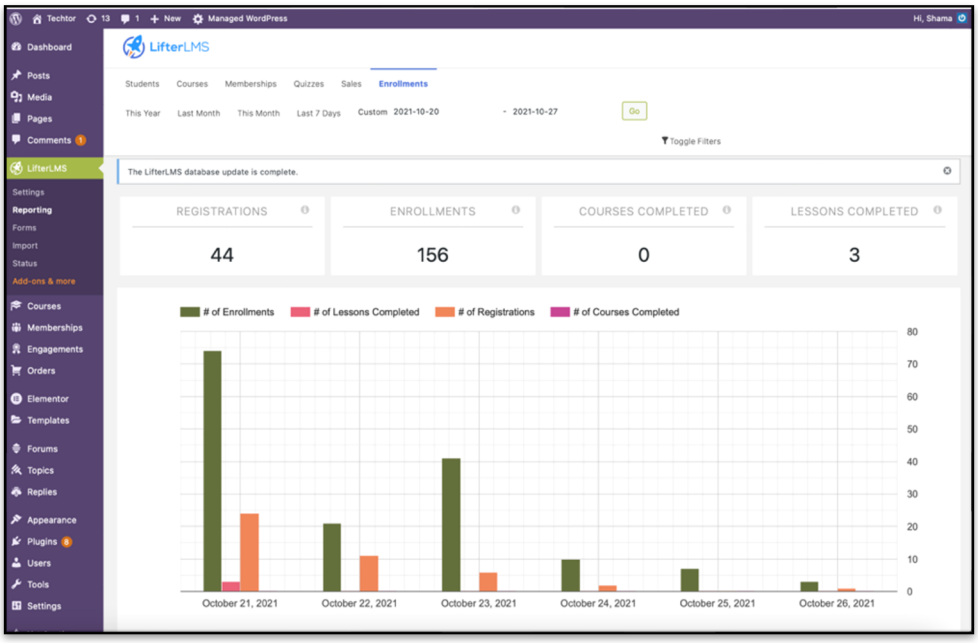
- *Enrol start and end date*: Once the Course was ready to be published on the web the instructor was able to enrol Student Teacher Educators on the website. Student Teacher Educators were allowed to enter only till the enrolment date was open. After that date, any enrolment was not taken by the platform.
- *Course start and end date*: Before the Course began the instructor can decide on the start date of the Course and also the end date after which the materials of the Course was not visible.
- *The number of enrolment*: Although the Course allows unlimited participation, the instructor was able to limit the number of participation/enrolment if required.
- *Sequence*: As many Courses are uploaded on the website, the instructor can activate this feature wherein Student Teacher Educators had to complete the Specialisation Course I to move to Course II and likewise.
- *Badges*: This functionality enables instructors to create badges for Student Teacher Educators , which are awarded to them upon completing a lesson or an entire module. Since not all Student Teacher Educators enrol intending to complete the entire course, with some only completing one or two units, it is crucial to acknowledge their learning. This is where digital badges come into play, as they are awarded for the successful completion of specific parts of the course. Nowadays, many MOOCs provide badges for completing the entire course, each unit, or even each week of coursework.
- *Certificates*: Kopp et al., (2017) stated that awarding certificates does have an impact on MOOC learners. This functionality allows the instructor to develop their certificates with the name of the learner, date of completion of the Course, and signature of the instructor.
- *Learners dashboards*: This is an important feature of LIFTERLMS where Student Teacher Educators were able to edit their information, see their progress in the Course, keep track of their progress and grades, and also find their badges and certificates at the end of the Course.

Figure 3.12: *Learner dashboard on the website*



- *Instructors dashboard*- This feature is only for the instructors wherein the instructor can track Student Teacher Educators ' progress, make changes in the Course, and also add new Courses

Figure 3.13: *Instructor dashboard in WordPress*



- *Mark complete*: It was a unique functionality provided by the LIFTERLMS plugin. After completing the lesson Student Teacher Educators needed to click on the "Mark Complete" button. This allowed Student Teacher Educators to mark their progress in the Course and move to the next lesson. Once the mark complete is clicked a pop-up was generated which showed the Student Teacher Educators the percentage of lessons they have completed. All the Student Teacher Educators were asked to click this button after the completion of a lesson.

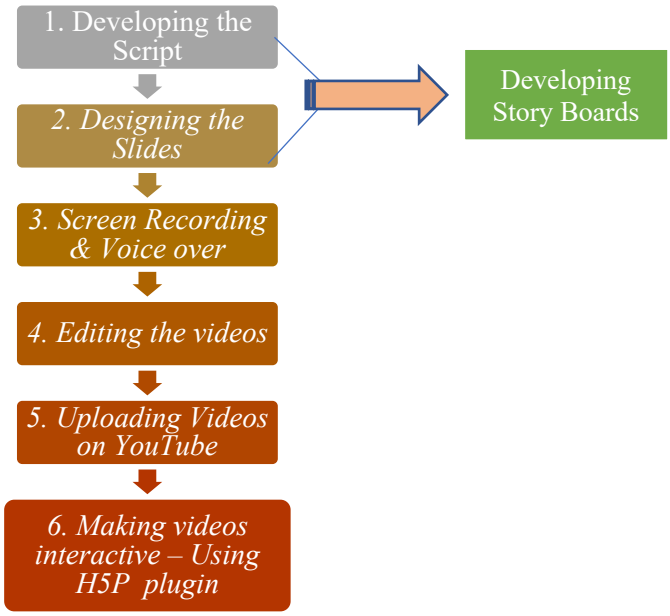
3.10.0 Development of Quadrants for MOOC

Various platforms, websites and applications were used to make the quadrants in the MOOC. All the steps were personally carried out by the researcher. The process employed in creating each of the quadrants is described below:

3.10.1 Video Lessons

Video lessons are the most important component of MOOC. The video gives Student Teacher Educators the feeling of an instructor teaching in a class but in virtual mode. In the present study videos were developed by the researcher and uploaded on YouTube. The link of the same was then integrated into the Course builder of LIFTERLMS. The following steps were taken into consideration while developing a video:

Figure 3.14: *Steps to Create an Interactive Video in MOOC*



STEP 1: Creating the script for the videos

The researcher reviewed books and online articles related to Research Methodology to develop the script. The researcher also reviewed the notes of student-teacher educators of the previous batch, to understand the level of language and content to be included in the videos. The script was prepared using Word document. All the content was prepared in English. The script was created using the topic covered in the three Specialisation MOOCs. Learning outcomes were also included in the script and every video had around two to three learning outcomes.

STEP 2: *Creating the Slides*

Once the script was prepared researcher used the following software for making presentations:

- *Prezi:* Unlike practically every other software on the internet, Prezi does not limit the presentation's structure to a straight line. The designer can create topics and subtopics, and arrange them in a more conversational flow of data.
- *Keynote:* It is a presentation app similar to Microsoft PowerPoint Presentation but Keynote is available on Mac laptops for making stunning presentations.
- *Canva:* It is a beautiful tool used to create presentations with eye-catching backgrounds and visuals. It is also easy to make and free to use.

Once the presentation software was finalized researcher started designing the slides. In the next step, the researcher started developing the storyboards and finalized the narration. A storyboard sample is attached in Appendix X.

STEP 3: *Adding voice-over to slides*

To convert the presentation to video format it was essential to record the screen and add a voice-over to each of the slides containing the content. For this purpose, the researcher made use of an inbuilt screen recorder of a personal MAC laptop. As it is essential to have clarity in voice and no backroad noise a microphone was essential to give the best results. Hence researcher decided to use Boya BYM1 Omnidirectional Lavalier Condenser Microphone with 20ft Audio Cable, which is an easy-to-use microphone and gives excellent audio quality while recording the audio. Once the voice-over was added to the

slides and the screen was recorded the draft video was ready. This draft video had to be edited for final use.

STEP 3: *Editing the videos*

It also happened various times that some unavoidable disturbances were heard in the video and it needed editing. To edit the video the researcher made use of open source downloadable software called Openshot Video Editor. This software provides content developers the features to edit videos, cut videos, trim videos, and add many animations to the same.

STEP 4: *Uploading Videos on YouTube*

Once the editing of the videos was done the final videos were uploaded on the YouTube account of the researcher. The video was given a name as per the topics covered in it. The video was kept unlisted (i.e. only those with the link can watch it) until the Course was ready and in the implementation phase. Once the videos were uploaded on YouTube, the link for the same was available. This link was then used in the H5P plugin to add interactions and video-embedded quizzes to it.

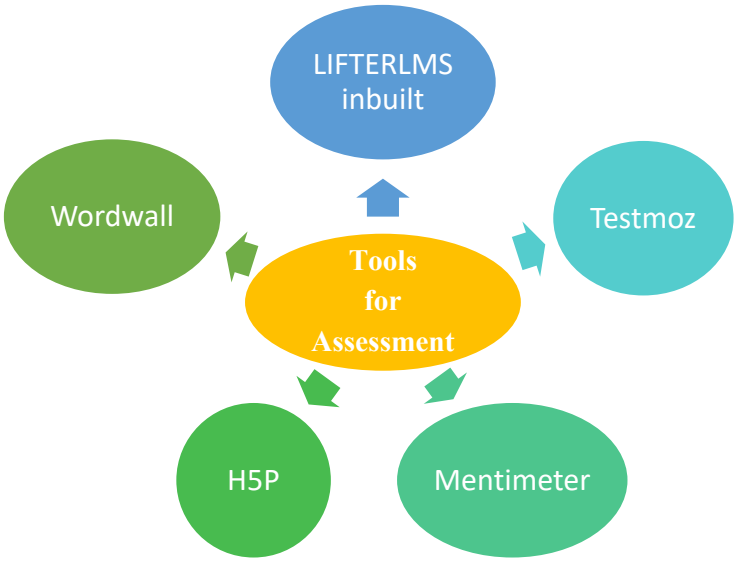
STEP 4: *Making videos interactive – Using the H5P plugin*

In the present video, the researcher included reflective spots or embedded quizzes in videos. According to a study by Shah et al., (2018), reflective spots are spots for the learner in the video wherein the instructor poses a question (automated MCQ, true or false, etc) and learners are supposed to pause the video and respond to the questions or activity. These reflective spots add interaction in videos and help Student Teacher Educators to reflect on the concepts that they learned in the video. To add the automated questions H5P plugin was used by the author which lets the instructor add, Multiple Choice Questions, True & False, Complete the Sentence, Identify the odd sentence, and many more interactions. The question helped the Student Teacher Educators to self-assess their learning and then move to the next lesson. Once the interactions were inserted into the videos, it was ready to be used in the Course.

3.10.2 Assessment

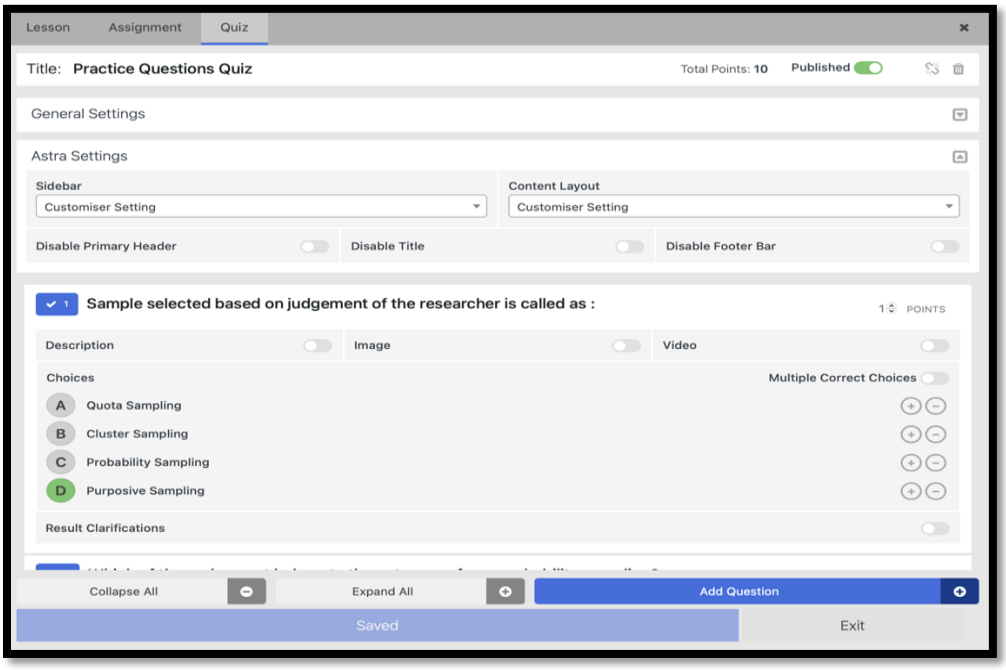
Assessments are the second most important component of MOOC and consist of both Formative Assessment (FA) and Summative Assessment (SA). In every Specialisation Course, the instructor used ten marks questions which were objective type and for summative assessment, six marks questions were utilized for subjective questions. The FA was automated marked and the student got results on the spot while SA was evaluated by the instructor based on the rubric and marks along with feedback and was provided to the Student Teacher Educators in the email. Although in MOOC the evaluation is hardly done by the instructor because of massive enrolment but as the study was done on 40 Student Teacher Educators only the researcher decided to use mix of open-ended and close ended questions (attached in Appendix XI). Along with marked FA, many other tools were also utilized for continuous assessment. The following tools were used for formative assessment:

Figure 3.15: *Tools for assessment in MOOC*



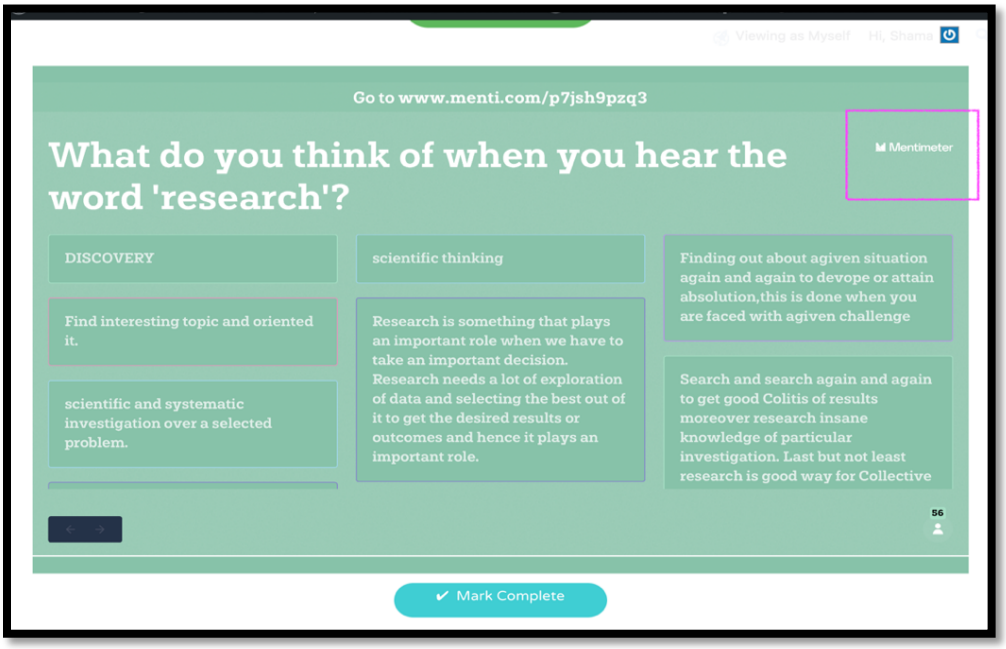
- Lifterlms quiz – The plugin had an inbuilt feature to add questions to the Course builder. In every Specialisation Course made, there were 10 multiple choice questions added in between the Course for Formative Assessment. It was in the form of an automated assessment and Student Teacher Educators got the opportunity to take the practice questions in three attempts and there was no limit.

Figure 3.16: *Practice questions using the inbuilt LIFTERLMS quiz*



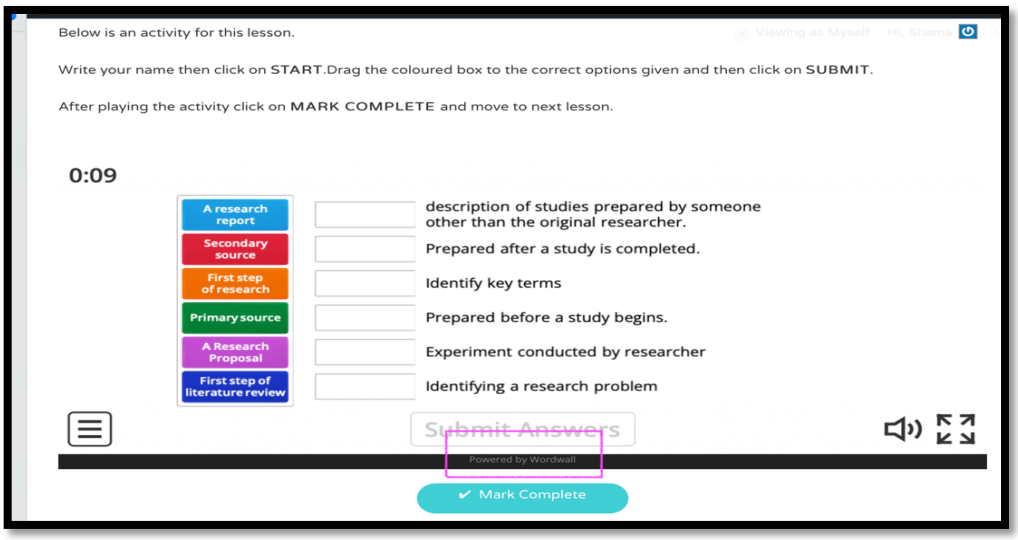
- Mentimeter- To engage Student Teacher Educators and make the assessment process interesting there were many games and activities also added in the Course which included Mentimeter. It is a digital presentation tool that works in real time. It's designed to be used in the classroom as well as for online learning. It was used to design various activities where Student Teacher Educators needed to reflect on a question posed to them and later they could see each other response on the wall.

Figure 3.17: *An activity using Mentimeter*



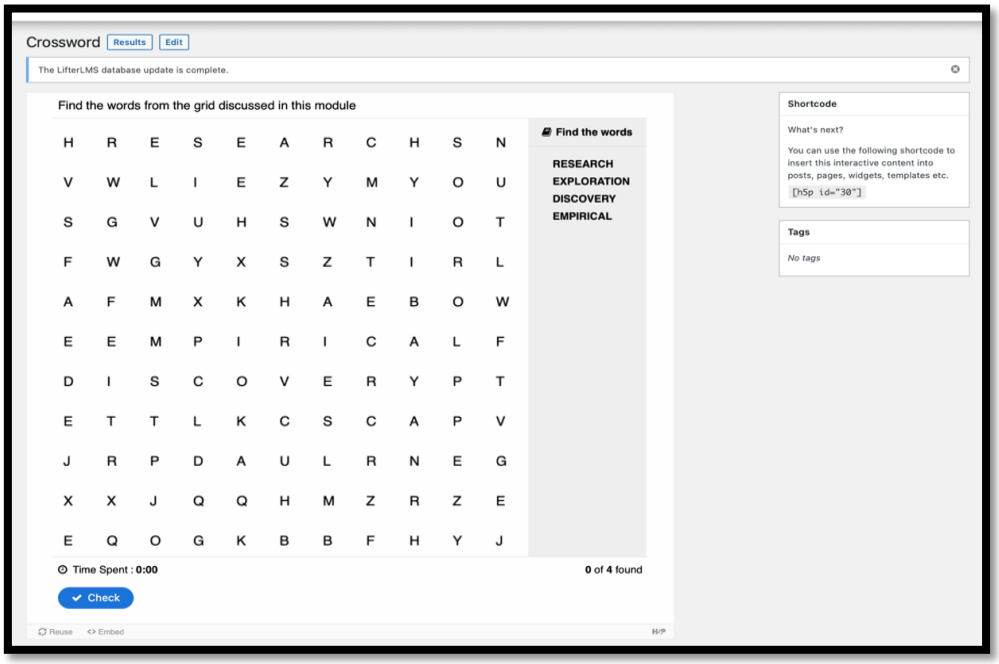
- Wordwall: It is a tool wherein teachers can create interactive games and resources for the Student Teacher Educators while teaching online. The various kind of templates that they provide included quizzes, matches, missing words, unjumble, random cards, anagrams, and many more. This website was used by the researcher to create interactive activities for the learners to keep them engaged.

Figure 3.18: *An activity using Wordwall*



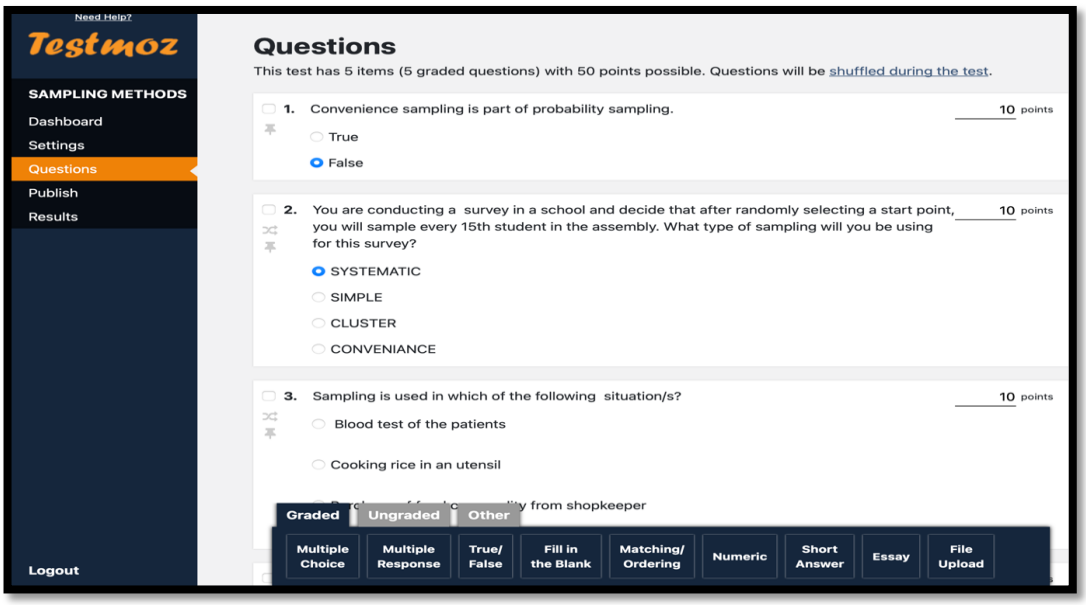
- *H5P plugin*: Along with adding questions in reflective spots it is also helpful to create engaging activities in the Course. This plugin was used by the instructor to add many activities to the Course which included flashcards, drag and drop, and crosswords.

Figure 3.19: *Crossword activity using the H5P plugin*



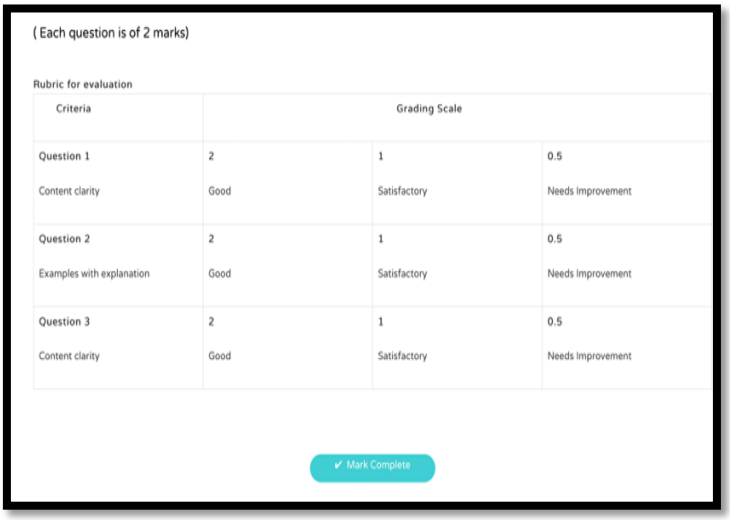
- *Testmoz:* It is an excellent tool to make tests for a Course. It has options to create a different type of video, image language, etc to be included in the test questions. The researcher utilized this tool to make a time-limit quiz for the Student Teacher Educators and also provided results at the end of top scorers.

Figure 3.20: *Quiz made using testmoz*



Summative assessment: To conduct an end of Course assessment, a Google form was used with three open-ended questions at the end of each Course. It was evaluated by the instructor of the Course and Student Teacher Educators received the marks along with the feedback in their email. Student Teacher Educators were also provided with the rubrics for assessment.

Figure 3.21: *Rubric for end Course assignments*



3.10.3 Discussion forum

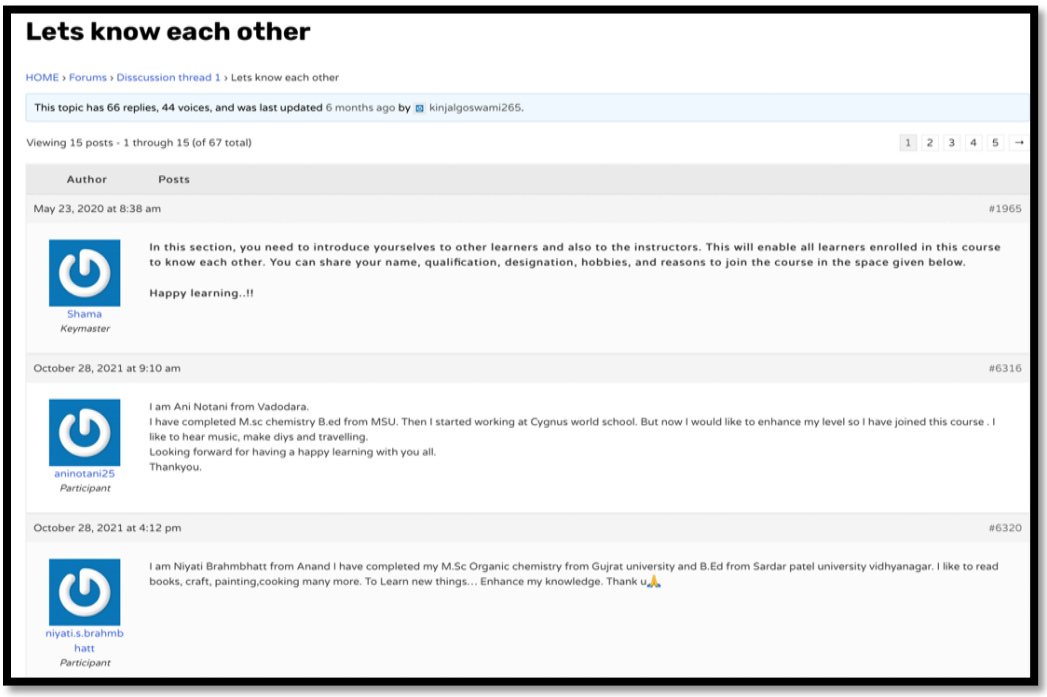
Discussion forums are asynchronous tools that are utilized in MOOCs. They are like virtual group discussion tools. The instructor poses a question and Student Teacher Educators answer them. Here the Student Teacher Educators can also solve queries asked by other Student Teacher Educators , engage in a healthy discussion among themselves and also like and comment on others' answers. In some discussion forums, the Student Teacher Educators also initiate a topic of discussion and ask other Student Teacher Educators to join in and collaborate. So this is an important tool to engage in healthy discussion among Student Teacher Educators and also make connections and promote networking among them. The researcher in the present study made one discussion forum for each Specialisation Course. In addition to that at the beginning of the first Course also a discussion forum was added to help student-teacher educators know each other. The following tools were utilized to make the discussion forums:

- Padlet: It is a very important tool to make discussion forums. Here instructor poses a question to Student Teacher Educators and Student Teacher Educators can reply to that. Moreover, they can also like and comment on others' replies. Colours can be given to the post and font can also be changed as liked by the Student Teacher Educators .

Figure 3.22: *Example of a topic being discussed in a forum using Padlet*

- BBpress plugin: It is a plugin widely used to create discussion forums in online Courses. The researcher utilized the plugin to create two discussions forum.

Figure 3.23: *Example of a topic being discussed in forum using bbpress*



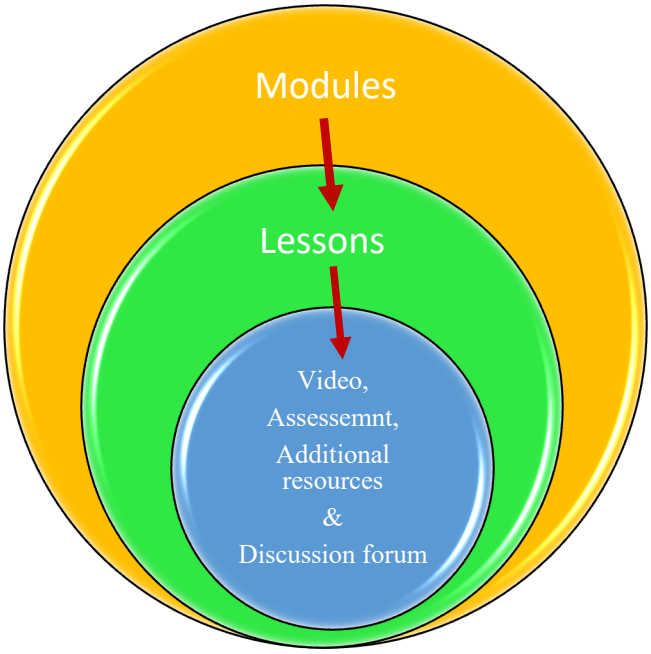
3.10.4 Additional resources

At the end of each video, so there were additional resources provided to the student-teacher educator. These resources were in the form of links to YouTube videos, website links, links to open-source articles, and some open-source presentations. All the resources which were provided to student-teacher educators were relevant to the topic taught in the video. Hence if they wanted to know the concepts in detail and understood them more in-depth they could use the additional resources.

3.11.0 Assembling the Quadrants : Course builder

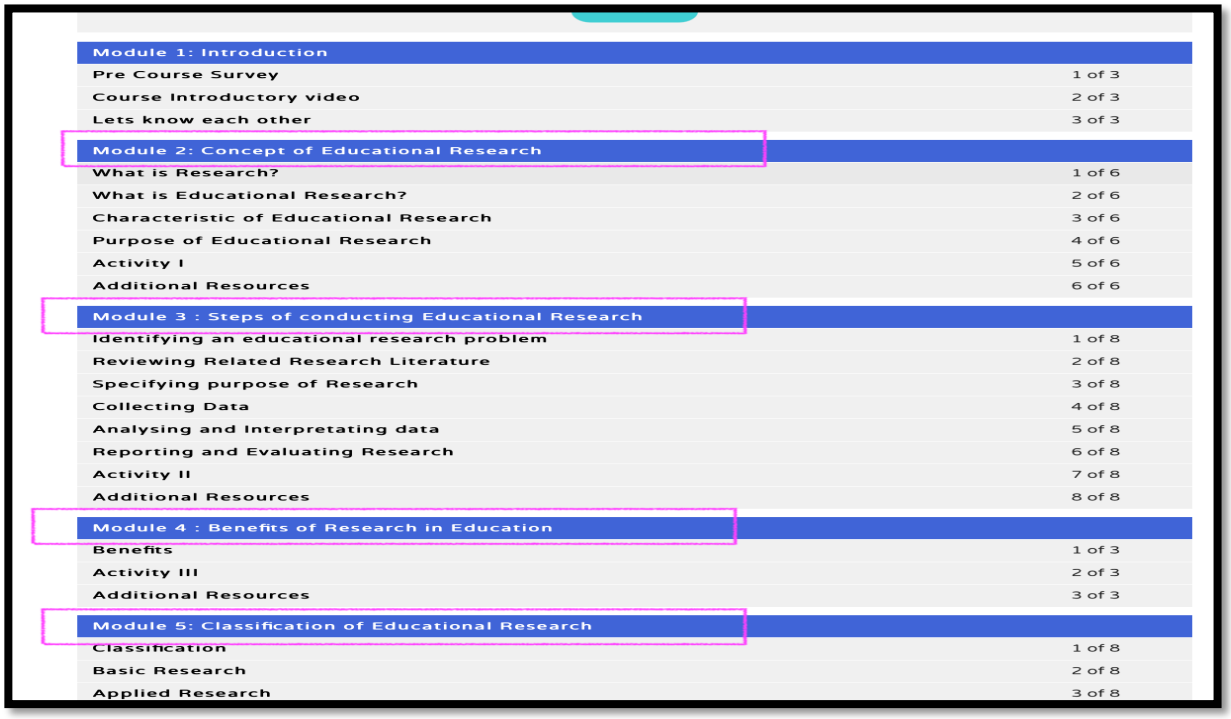
Once all the e-content was prepared and made ready by the researcher, the e-content was then arranged in the lifter LMS Course builder. The content was divided into modules and lessons:

Figure 3.24: *Pictorial representation of building a Course*



- **Modules:** Each of the Specialisation Courses was divided into a maximum of seven modules. These are like a different unit in the syllabus which further contains content in the form of lessons.

Figure 3.25: *Modules for Specialisation Course I*



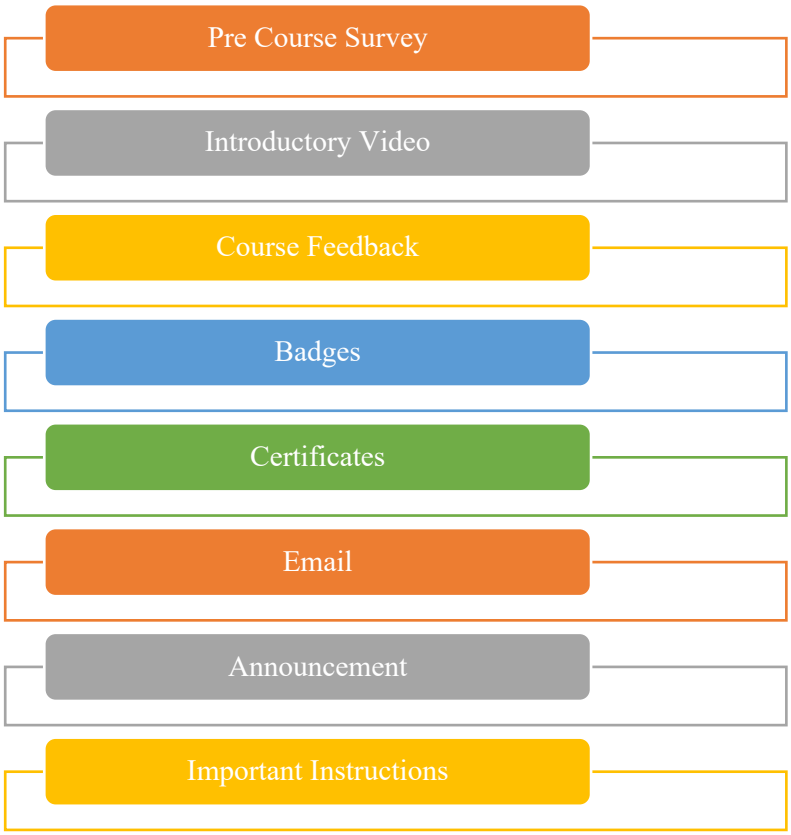
- **Lessons:** In each of the modules there were up to eight lessons. Each module consisted of interactive video lessons, assessments, activities, and additional resources for references in the form of lessons. So all the e-content that was developed earlier was uploaded in its appropriate lessons.

A final outline for all three Specialisation Courses along with the different resources used to make the course is attached in Appendix XII.

3.12.0 Additional Elements of MOOC

Massive open online courses consist mainly of four quadrants i.e. video lessons, assessments, additional resources, and discussion forums. Moreover, it also has a few other elements as important parts of the Course as shown in Figure below.

Figure 3.26: *Additional elements of MOOC*

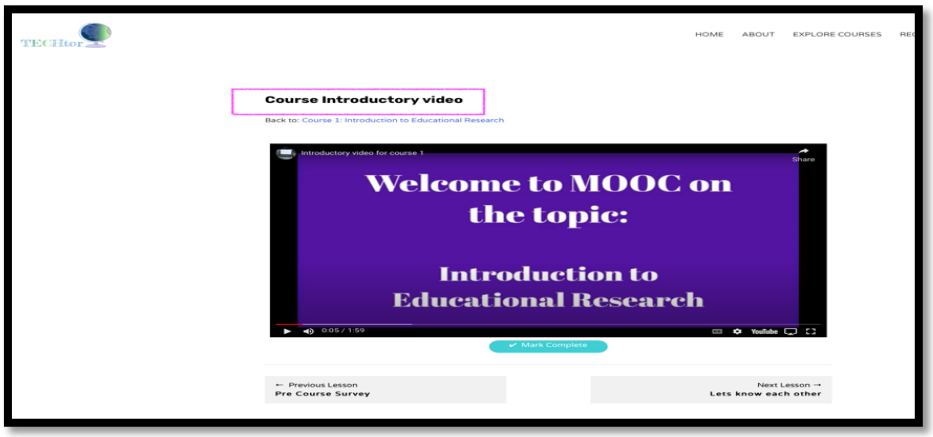


⇒ *Pre-Course Survey*: A pre-Course survey always help Course developers and instructors to get to know their learners and get a rich background of the Student

Teacher Educators enrolled in the MOOC. Student Teacher Educators enrolled in the MOOC were asked to fill out a pre-Course survey. The survey consisted of questions like age, gender, highest educational qualification and languages known, etc. They were also asked the question about their intentions to enrol in the Course?, how would they like to learn in the Course?, and what they hoped to get out of the Course. etc. Student Teacher Educators were also asked about the advice they would like to give to the instructors of the Course before the Course starts. Student Teacher Educators were also asked about their previous awareness and interaction with MOOCs. The developed pre-course survey is attached in Appendix XIII.

⇒ *Introductory video:* Every Specialisation Course had one Introductory Video which was made and uploaded on YouTube. This video gave an overview of the Course quadrants, duration, medium of instruction, instructor, and also the criteria for getting a certificate.

Figure 3.27: *Introductory video for Course I*

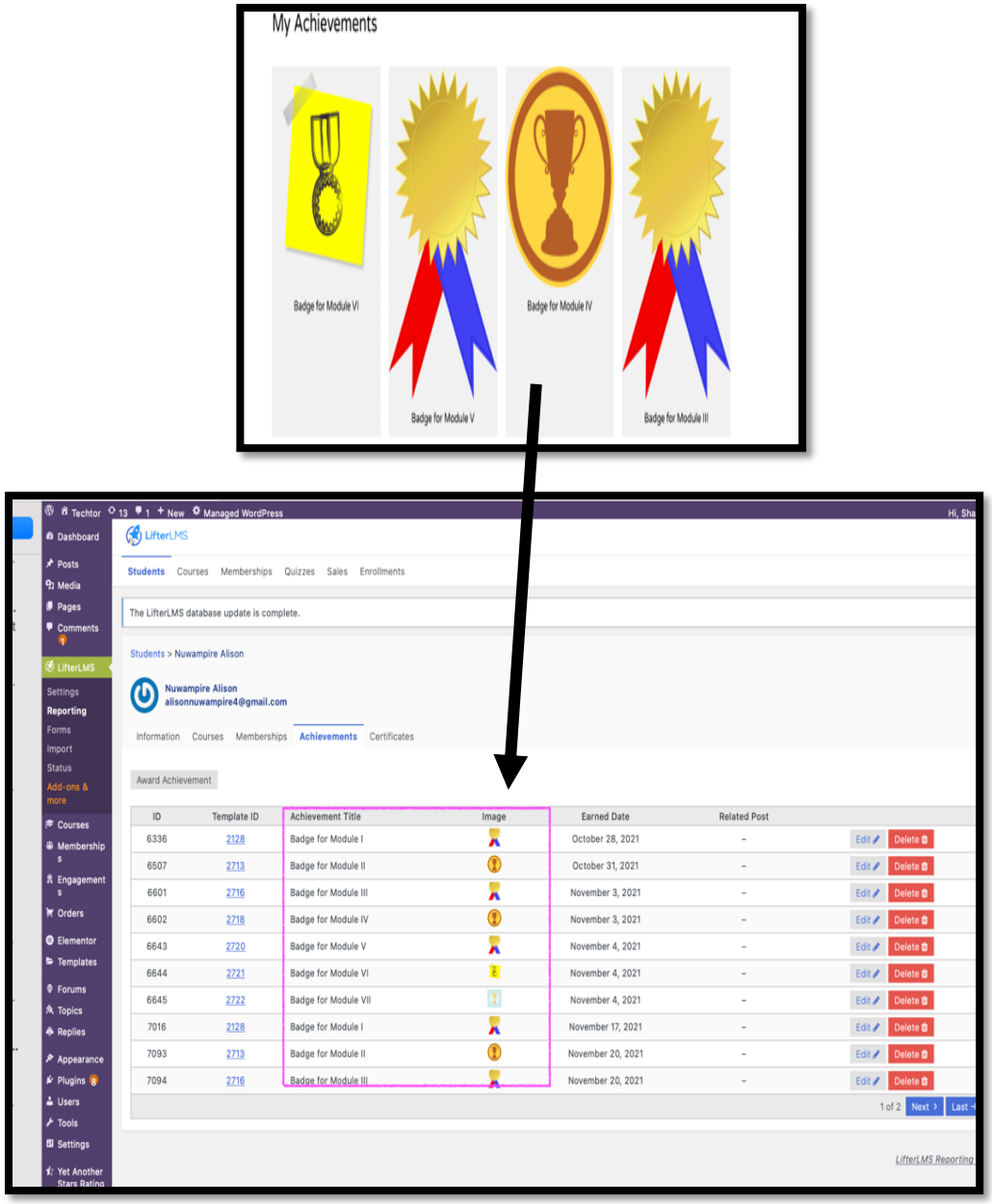


⇒ *Feedback for the Course:* To get Student Teacher Educators ' feedback for all three Specialisation Courses, a Course feedback form was prepared. It consisted of two open-ended questions on challenges faced in the Course and recommended changes for the Course and two close-ended questions about rating and challenges faced. The feedback form was made using Google Forms. The feedback form for each course is attached in Appendix XIV.

⇒ *Badges:* The instructor provided a badge as an accomplishment and also to mark the progress. The badges were provided to student-teacher educators as soon as they

complete a module. The badges were prepared using free PNG images used on the internet.

Figure 3.28: *Badges for each module*

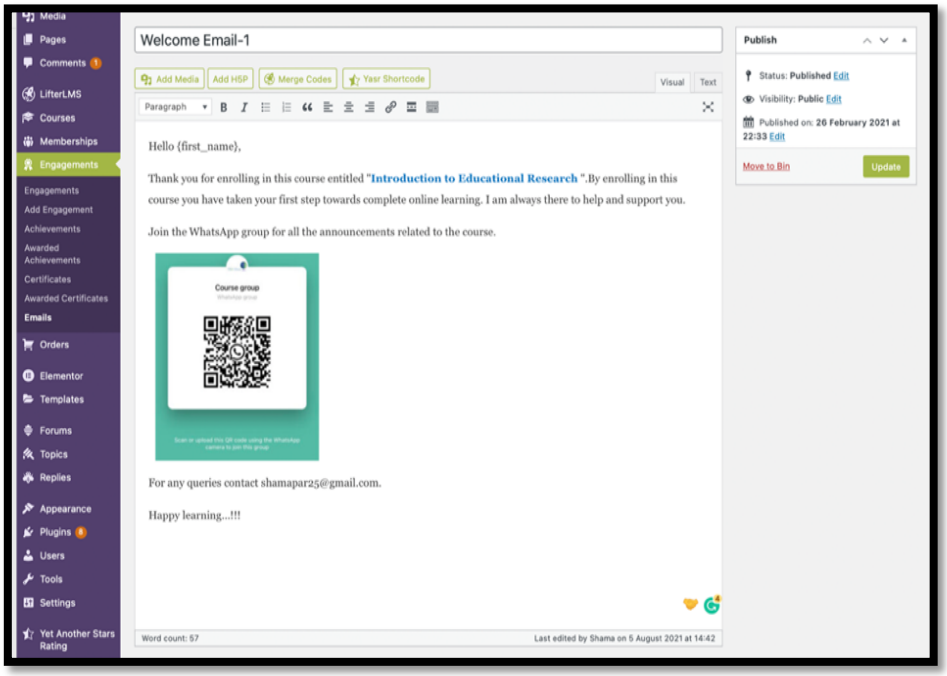


⇒ *Certificates*: At the end of each Specialisation Course a Certificate of Course Completion was provided to student teachers and educators. It mainly consisted of the name of the student teachers educator, date of completion of the Course, name of the Specialisation Course completed, and also the sign of the instructor and name of the platform where the Course was pursued. Student Teacher Educators had the option to view, download and share the certificate with others.

Figure 3.29: *Certificate Template*

⇒ *E-mail*- Once the student-teacher educator got enrolled in the Course, they got a welcome email from the Course instructor. It was a confirming email for the Student Teacher Educators that they are successfully enrolled in the Course. The email was sent from LIFTERLMS and it was an automated email being sent to the Student Teacher Educators on the enrolment. The content of the email was prepared by the researcher.

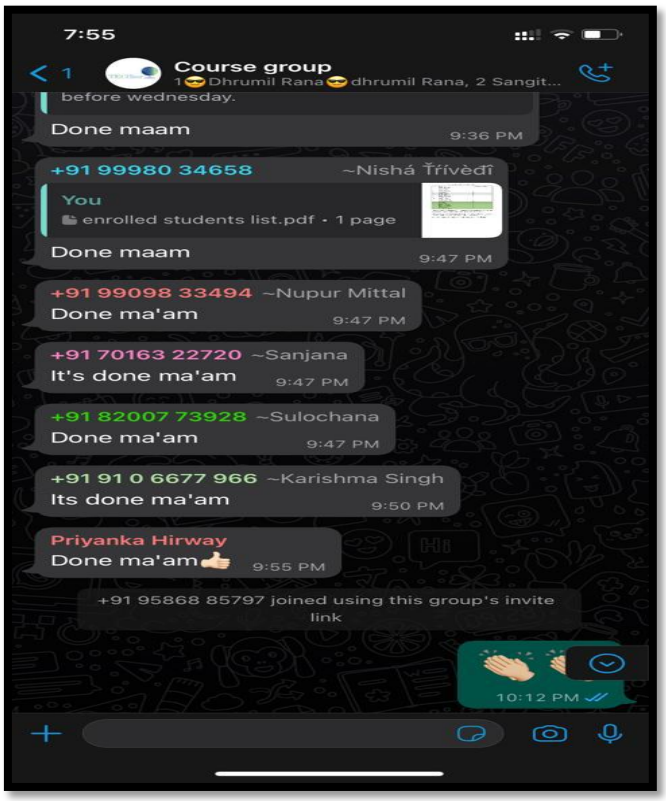
Figure 3.30: *Welcome Email template for Course I*



⇒ *Announcement:* A WhatsApp group was formed in the name of "Course group" to provide all the announcements related to the Course in the group. It is an important

medium to share all updates related to the Course. Student-teacher educators also had the liberty to ask any query so that other Student Teacher Educators facing the same query can get help. All the announcements related to the Course were sent to the group by the researcher. They were welcome to post queries any time of the day to get their queries solved either by peers or by the instructor.

Figure 3.31: *Screenshot of Course Group*



⇒ *Important instruction*: A list of instructions was provided to Student Teacher Educators for easy navigation in the Course and completing the Course without any major trouble. These instructions were included on the home page of every Specialisation Course. Instructions included:

- Always remember the ***Email Id and password*** you have used to log in. It will be difficult to reset the password once lost.
- After you enrol in this Course you will get a **Welcome mail** in your email id(also search in spam section).
- The Course has **a** maximum of **7 modules** with some lessons(in the form of videos, activities, additional readings, discussion forums, quizzes, etc) in each of them.
- After successful completion of every **Module,** you will receive a "**LEARNER BADGE"** which you can see in the achievement section of your dashboard.

- Click on **"MARK COMPLETE" or "TAKE QUIZ"** after every lesson to mark your Course progress.
- Every content video in this Course has interactive **pop-ups** in between leading to basic questions for recapitulation. Answer each of them. And don't forget to click on **SUBMIT button** at the end of each video.
- After every video, there will be some additional readings for that video content. They are all links to external websites, you can visit them for in-depth reading of the content.
- Your participation in the **discussion forum** is important for certification and Course completion.
- For a better audio experience kindly make use of headphones. You can also maximize the video to view the full screen.
- 100% completion of the Course with assignments submissions will only get you a **CERTIFICATE**. You will receive your certificate within 7 days after completing the Course.
- If you face any difficulty in navigating through the Course post your queries above in the **QUERIES** section.
- This Course is self-paced. The content in the Course will be available for **THREE WEEKS** (scheduled start and end date). You can complete the Course within this period of three weeks, after which Course content will not be displayed.Then you can then move to the next Course.
- There is a practice question of ten marks(multiple choice question of one mark each) and one end Course assignment of 6 marks. You should try to get a minimum of 30 % in both of them and then you can move to the next Course.

3.13.0 Development of an E-Manual

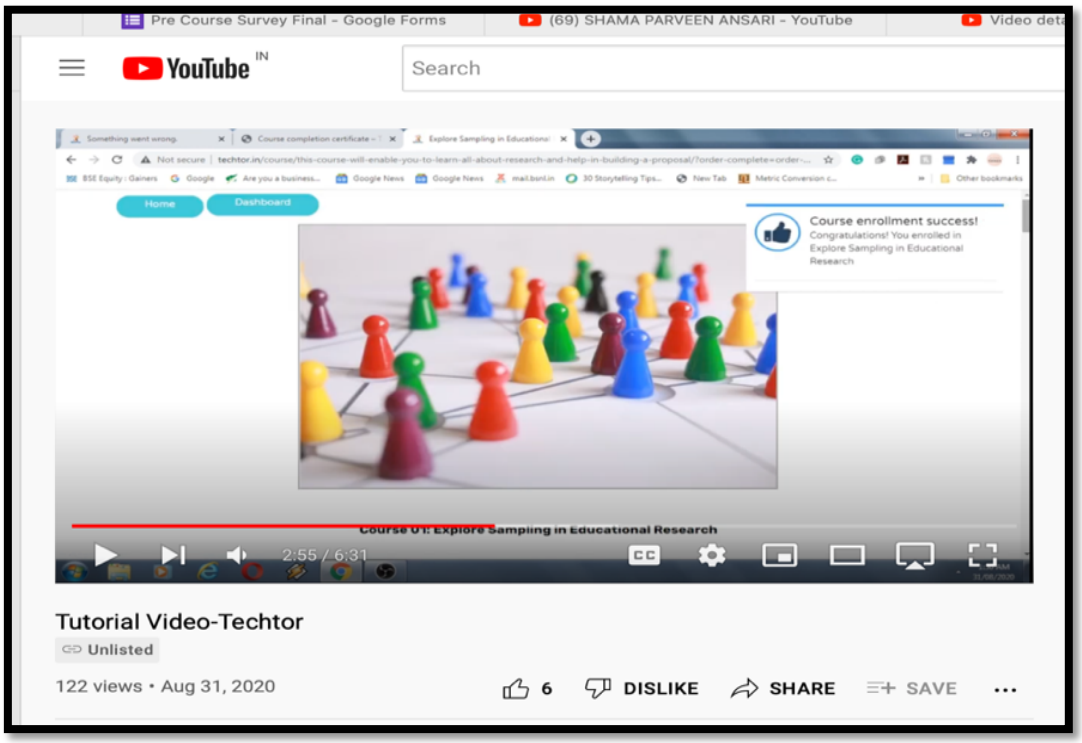
When a Course is being developed on an established platform like Moodle or Google Classroom it is known by the Student Teacher Educators how to browse the Course. But when a platform is designed for the first time, then a manual helps Student Teacher Educators to understand how the Course works and what the steps are to be followed to navigate the Course. Here manual becomes a very important component of a Massive Open Online Course. It acts as a guide for Student Teacher Educators on how to use the Course. A user manual, often known as an instruction manual, is a critical document that assists Student Teacher Educators in rapidly becoming familiar with the Course, or in resolving

a problem once they have it. The manual was prepared by the instructor and it consisted of all steps that Student Teacher Educators need to follow from registering for the Course to achieving the certificates. It consisted of thirty pages with images on how to use the Course contents. The manual is provided in Appendix XV.

3.14.0 Development of a Tutorial video

A video tutorial is a form of instructional video that consists of a series of recorded stages for completing a task. Demonstration videos, simulations, how-to videos, and recorded classes are all examples of video tutorials. The researcher in the present study developed a demonstration video wherein all the steps of navigating the Course were recorded by the researcher, voice-over of the recordings was done and uploaded on YouTube. The link for the video was saved to share later with student-teacher educators

Figure 3.32: *A tutorial video on how to use the platform uploaded on YouTube*



3.15.0 Development of an Orientation Presentation on MOOC

With the help of a keynote, a presentation was prepared to make Student Teacher Educators understand the meaning of MOOC, and how it works and introduce them to the newly designed platform techtor.in. The presentation is attached in Appendix XVI

3.16.0 Validation of MOOC

The storyboards along with the manual, instructional video, and link to the course were initially shown to five research scholars from the Department of Education, The M. S. University of Baroda, Vadodara. They were mailed to provide their valuable feedback on the Course. They were also asked to fill out a Google form to provide their feedback. All their comments and views were noted and changes were done in the Course wherever required. Then it was shown to experts in the field of Education and web development. All their feedback was noted and changes in the Course were done accordingly. After the validation of the Course, it was finally ready for pilot testing.

3.17.0 Try out: Piloting the MOOC

Pilot testing is done majorly to find the feasibility of a tool or program. As per Christensen et al, (2014) when conducting an internet-based study, the researcher should self-pilot as well as select some participants to complete the Course. This will enable the researcher to know whether the Course works properly in his/her browser. Hence the first pilot was done by the researcher to see whether all Course components were working properly. According to Connelly (2008) & Isaac and Michael (1995), a pilot study sample should be 10% of the sample project for the larger parent study. As the sample size was 80 individual's researchers decided to implement it on 10 Student Teacher Educators of M.Ed. in the first year. A Google form was circulated in groups for consent to participate in the pilot study. Ten Student Teacher Educators other than the sample were finalized on whom the MOOC was implemented. They were also provided with the manual. Once the pilot testing once over, the researcher made some minor modification to the Course, as suggested by them. The entire Course is available on techtor.in

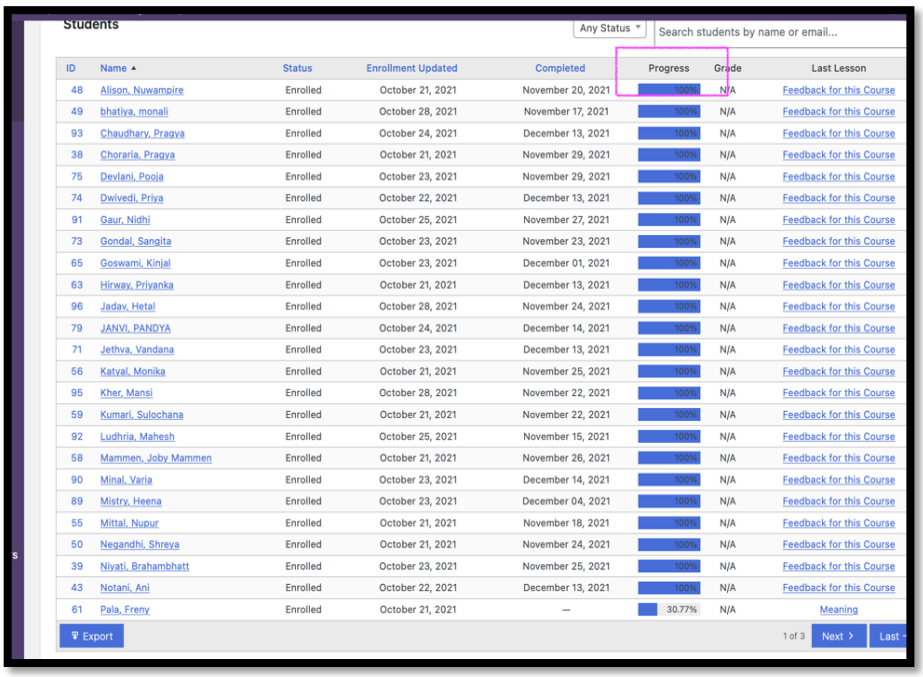
3.18.0 What makes the MOOC on techtor.in unique?

Although MOOCs came into existence in 2008, their popularity took a huge leap during the pandemic. People all around the world were stuck in their houses, schools and colleges were closed and the only medium remained for learning was online. At that time, many people started exploring Massive Open Online Courses. The popularity of MOOCs increased and many universities started offering MOOCs abroad. Even the number of Courses on SWAYAM also grew in number which is a national platform offering MOOCs in India. In the present study, the MOOC developed as well as implemented has been quite

distinct from the other MOOCs being offered worldwide. Following are some noteworthy points of MOOCs on techtor.in:

- The platform for hosting MOOC was developed using WordPress. It is a personalized website and can be customized whenever required. No third party is involved in making and uploading the content or working in partnership with it. So the instructor/institution can make changes to the website as per their requirements, with a little technical knowledge.
- The *MARK COMPLETE* feature after every lesson is a new feature that gives freedom to Student Teacher Educators to mark their lesson when complete. This makes tracking lessons easier for Student Teacher Educators .
- Student Teacher Educators' progress report is easy to make in lifter LMS and their progression can be tracked easily by the instructor.

Figure 3.33: *Progress report of Student Teacher Educators in LIFTERLMS*



- This progress report was downloadable and was shared daily with Student Teacher Educators, to let them also know where they stand with respect to other Student Teacher Educators in the Course. It also helped Student Teacher Educators to visualize how much still is left to be done in the Course and what is their progress in terms of percentage. Hence it was shared as daily feedback by the researcher.

- The platform is accessible across different devices (desktops, tablets, smartphones) and provides flexibility in course scheduling or self-paced learning options. It also limits the number of enrolments as per the needs of the instructor.
- The entire Course has been made after reviewing all free versions and open-source software available online. Hence the entire Course is budget friendly and sustainable.
- The MOOC has an extensive range of interactive activities and games designed to engage and immerse Student Teacher Educators. These activities go beyond traditional lectures and incorporate interactive elements such as quizzes, activities, games and discussions. This approach promotes active learning and enhances the overall learning experience for Student Teacher Educators. It also motivates learners to complete courses and achieve higher levels of engagement.
- Developing a MOOC is a team effort. Literature suggests that institutes need a production team, videographer, technical assistance, and many other assistants to develop a MOOC. The MOOC developed in the study is an example that without much assistance a prospective teacher educator can also develop a MOOC with some basic skills and interest in using online learning platforms.
- The LIFTERLMS plugin used to build the Course is mobile-friendly and can be used to learn through mobile without major challenges. They don't need laptops, computers, or speakers to learn; all they need is a smartphone and access to a Wi-Fi or mobile network.

Although the basic quadrants of MOOC remain the same, the way it is developed and implemented can bring a huge difference for an institution and can provide Student Teacher Educators with an alternative platform to learn and develop research skills.

3.19.0 PROCEDURE FOR DATA COLLECTION

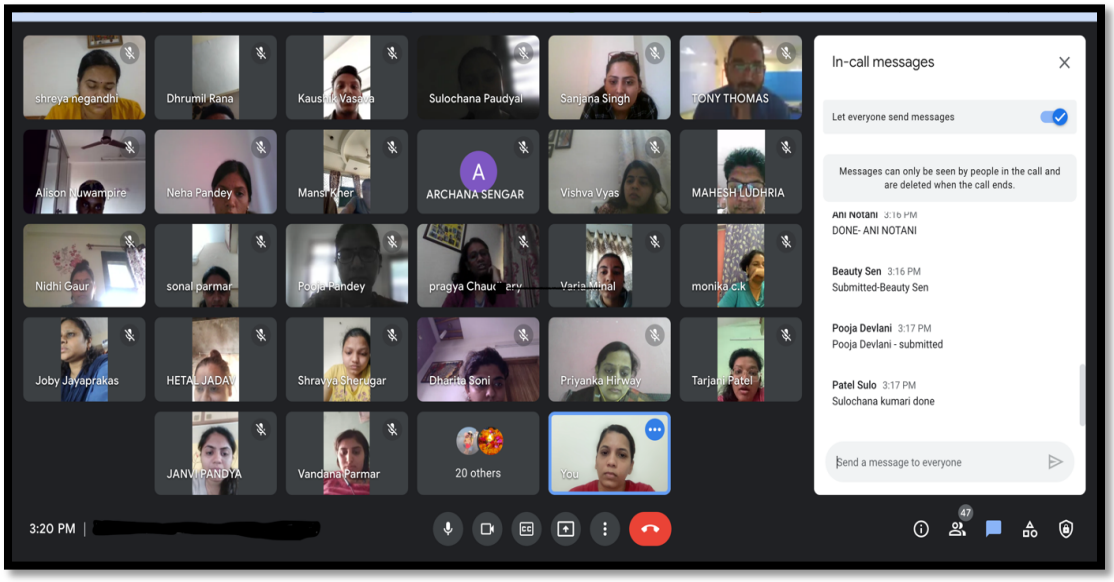
The study was carried out in September 2021, when institutions were getting back to normal after the second wave of the pandemic, and the majority of the Student Teacher Educators and teachers were working from home. The researcher sent an email to different instituting running two years M.Ed. Course in Gujarat, to get permission to conduct the study. The institution which replied to the email and gave permission was taken as a sample for the study. A formal letter approved by the guide was then sent to the institution which agreed to be the control group. Data were collected from the experimental and control group during the implementation phase. Pre-test and post-test were administered in both the control and

experimental group. The Massive Open Online Course was implemented in the experimental group and the control group was taught through the Conventional method. Here conventional method means the method adopted by the teachers in the control group to teach their Student Teacher Educators and as it was a time of Covid-19 so conventional method mainly comprised of online teaching on Zoom and Google Meet platforms. The data collection process lasted for around four months. A detailed description of the steps undertaken for data collection is given below.

3.19.1 Step I: Pre-Testing

Classes for the batch of 2021-2023 M.Ed. program began in September 2021. Orientation and settling of the batch occurred in September. Student teachers and educators of both the experimental and control group were invited to a Google Meet class. They were asked to keep their video on and mute their mics. They were provided with a Google form link to the pre-test. They were given 50 minutes to complete the test and questions were randomised in the test. Detailed instruction was provided to the Student Teacher Educators and the purpose of the study was also made clear to them before implementing the pre-test.

Figure 3.34: *Administration of pre-test*



3.19.2 Step-II: Implementation of MOOC

In the present study, the MOOC was developed to evaluate its effectiveness in terms of Student Teacher Educators' achievement, reaction, and experience. After the researcher got permission from the head of the department to implement the MOOC in the experimental

group, the steps to implement the Course began. The timeline for the implementation of tools and MOOC is briefed in the table given below in Table 3.1.

Table 3.1: *Timeline for Data Collection*

SR. NO.	IMPLEMENTATION STEPS	MONTH & YEAR
1	Pre-Test in both the Control group and Experimental group	September 2021
2	Orientation about MOOCs	September 2021
3	Implementation of MOOC in Experimental Group	October 2021 to December 2021
4	Post-Test in both the Control group and Experimental group	January 2022
5	Post Experimental Interview	January 2022

The first step was to make a WhatsApp group wherein all the Student Teacher Educators enrolled in the batch of M.Ed. first year of 2021-23 were asked to join. In the last week of September 2021, a virtual meeting was conducted using the platform google meet, and a link for the same was shared on the WhatsApp group. Student Teacher Educators of the experimental group were introduced to the topic of the Massive Open Online Course. The researcher also explained to Student Teacher Educators about the new platform techtor.in and ways to get access to it. The experimental group was also instructed on how to register on the platform and enrol in the Course. Once the meeting was over the student-teacher educators were provided with the manual and tutorial video on the WhatsApp group. The experimental group was given one week to go through the manual, see the tutorial video, and enrol in all three Specialisation Courses. A registered list of Student Teacher Educators is attached in Appendix XVII.

Once all Student Teacher Educators got registered on the website and enrolled in the three Courses the Specialisation Course I began. The Course was self-paced with a fixed duration and lasted for three weeks with a set start and end date. The first Course was having seven modules and 32 lessons among them. The detailed modules along with the lessons are given below in Table 3.2. In Course I, Student Teacher Educators had to begin with a pre-Course survey and introduce their lesson on knowing each other through a

discussion forum. The student-teacher educators had to watch the videos, complete the quiz in the video, read the additional resources provided, and also take part in all automated quizzes. The Course ended with an assignment and feedback form. The instructor used to send an automated progress report of all Student Teacher Educators on WhatsApp daily to let them be aware of their progress and also to motivate them to complete the Course on time. A report is attached in Appendix XVIII.

Table 3.2: *Modules and Lesson of Specialisation Course I*

Sr no	Course I	Lessons	Type of Lessons
1	Module 1: Introduction	Pre Course Survey	Google form
		Course Introductory video	Video
		Let's know each other	Discussion forum
2	Module 2: Concept of Educational Research	What is Research?	Video
		What is Educational Research?	Video
		Characteristics of Educational Research	Video
		Purpose of Educational Research	Video
		Activity I	Mentimeter
		Additional Resources	Website links
3	Module 3: Steps of Conducting Educational Research	Identifying an educational research problem	Video
		Reviewing Related Research Literature	Video
		Specifying the Purpose of Research	Video
		Collecting Data	Video
		Analyzing and Interpreting data	Video
		Reporting and Evaluating Research	Video

		Activity II	Wordwall
		Additional Resources	Website links
4	Module 4: Benefits of Research in Education	Benefits	Video
		Activity III	Wordwall
		Additional Resources	Website links
5	Module 5: Classification of Educational Research	Classification	Video
		Basic Research	Video
		Applied Research	Video
		Evaluative Research	Video
		Action Research	Video
		Types of research-By Approach	Video
		Discussion forum	Padlet
		Additional resources	Website links
6	Module 6: Net Smackdown for Course I	Glossary of terms	H5P activity
		Practice Questions	Automated quiz
7	Module 7: Final Assignment	Final Graded Assignment	Google form
		Feedback for this Course	Google form

Once Course I was over, student teachers and educators were given a gap of two days, and then asked to begin with Course II. This Course was also of three weeks duration and comprised five modules and a total of 24 lessons among it. The detailed modules along with the lessons are given below in Table 3.3. The researcher kept track of Student Teacher Educators' progress and also mentored them on WhatsApp in case of any difficulty.

Table 3.3: *Modules and Lesson of Specialisation Course II*

Sr no	Course II:	Lessons	Type of Lessons
	Module 1: Quantitative Research	Course Introductory video	Video
1		Meaning	Video
		Survey Research	Video
		Experimental Research	Video
		Correlational Research	Video
		Activity I	Wordwall
		Additional Resources	website link
2	Module 2: Qualitative Research	Meaning	Video
		Case Study Research	Video
		Ethnography Research	Video
		Phenomenological Research	Video
		Narrative Research	Video
		Critical Qualitative Research	Video
		Historical Research	Video
		Activity II	Wordwall
3	Module 3: Mixed Method Research	Concept of Mixed Method Research	Website links
		Types	Video
		Importance	word wall
		Additional resources	Website links
		Activity III A	Video
		Activity III B	Video

4	Module 4: Net Smackdown	Glossary of terms	H5P activity
		Practice Questions	Automated quiz
5	Module 5: Final Assignment	Final Graded Assignment	Google form
		Feedback for this Course	Google form

Once Course II was over, student teachers and educators were again given a gap of two days and then asked to begin with Course Three. This Course was also of three weeks duration and comprised six modules and a total of 33 lessons among it. The detailed modules along with the lessons are given below in Table 3.4. during this Course also researcher kept track of Student Teacher Educators' progress and also mentored them on WhatsApp in case of any difficulty.

Table 3.4: *Modules and Lesson of Specialisation Course III*

Sr no	**Course III**	**Lessons**	**Type of Lessons**
1	Module 1: Basic Terms in Sampling	Course Introductory video	Video
		Introduction to this Section	Video
		Population & Sample	Video
		Sample Size	Video
		Additional Resource	Website links
		Activity I	Mentimeter
2	Module 2: Probability Sampling Method	Introduction to this Section	Video
		Meaning of Probability Sampling	Video
		Simple random sampling	Video
		Stratified Sampling	
		Cluster Sampling	Video
		Systematic Sampling	Video
		Multistage Sampling & Multiphase Sampling	Video
		Additional Resources	Website links

		Activity II	H5P plugin
3	Module 3: Non-Probability Sampling Method	Introduction to this Section	video
		Meaning of Non-Probability Sampling	video
		Convenience Sampling	Video
		Purposive Sampling	Video
		Quota sampling	Video
		Snowball Sampling	Video
		Additional Resources	Website link
		Activity III	Testmoz
4	Module 4 Sampling: Few basic facts	Introduction to this Section	Video
		Selecting a Sample	Video
		Sampling Error	Video
		Sampling in Qualitative Research	Video
		Activity IV	H5P
		Additional Resources	Website links
		Discussion forum	Padlet
5	Module 5: Net Smackdown for Course III	Glossary of terms	H5P activity
		Practice Questions	Automated quiz
6	Module 6: Final Assignment	Final Graded Assignment	Google form
		Feedback for this Course	Google form

Once the implementation of the three Specialisation Courses was over researcher implemented the post-test on both the control and experimental group and the reaction scale on the experimental group. Later some Student Teacher Educators of the experimental group were interviewed to collect their experience of learning through MOOC.

⇒ INSTRUCTOR ROLE IN IMPLEMENTATION OF MOOC

Massive Open Online Courses are self-paced Courses designed for learners with minimum support from the teacher also called an instructor in MOOC. The role of the instructor here is not as a sage on the stage but as a mentor and tutor to guide the Student Teacher Educators in the Course. The following activities were performed by the researcher as an instructor of the MOOC to guide the Student Teacher Educators .

- Conducting an Orientation class on Google Meet and teaching them about what the MOOC is all about.
- Creating a WhatsApp group to solve any challenge or query Student Teacher Educators had while learning through MOOCs. The instructor made sure all queries were responded to as soon as possible, and Student Teacher Educators were also allowed to post their problems 24x7 on the group.
- Replying to Student Teacher Educators' answers on the discussion forum and moderating it.
- End Course assignment was marked manually by the instructor and feedback was provided for each answer.
- Practice questions were provided with three attempts to get a 50% score, but if Student Teacher Educators were not able to get enough scores providing they with more attempts.
- Sometimes the additional resources link expired during the Course so providing Student Teacher Educators with new links.
- Keeping track of Student Teacher Educators' progress and reminding them through emails if Student Teacher Educators missed a lesson or two and did not return.
- Sending progress reports on WhatsApp daily as feedback to Student Teacher Educators and to motivate them to complete the course in time.
- Motivating Student Teacher Educators to complete the Course on time by reminding them of deadlines on WhatsApp group.
- The researcher in the present study was both developer and instructor of the Course. So any kind of troubleshooting during the implementation was solved by the researcher only.

For Student Teacher Educators not to feel lost in the Course, the instructor needs to be always available to guide them. From reaching the platform techtor.in to registering for the Course and completing all three Specialisation MOOCs, the researcher was always available to help the student-teacher educators for completing the Course, without any major difficulty.

3.19.3 Step-III: Post-Testing

The Massive Open Online Course was implemented in the experimental group. Thereafter the same pre-test was again administered as a post-test on both the experimental and control group. Both the groups were separately invited for a Google Meet and a Google link to the post-test was shared among both groups. The data for the post-test was collected in January.

3.19.4 Step-IV: Reaction scale

Once the post-test was administered to the Student Teacher Educators of both the experimental and control group, a reaction scale was implemented on the experimental group. The purpose of the reaction scale was to know the reaction of the student toward the developed MOOC. Clear instruction was given to the Student Teacher Educators on how to use the scale and the purpose of using the scale. A Google link was shared with Student Teacher Educators in the WhatsApp group to complete the reactions scale. In the five-point Likert-type reaction scale Student Teacher Educators had to tick on the most suitable point(ranging from strongly agree, agree, undecided, disagree, and strongly disagree) for each statement. The reaction scale consisted of 35 statements and the instructor made sure that no student-teacher educators left any statement.

3.19.5 Step-V: Post-experimental interview

Once the implementation of the MOOC was over and data was collected through the post-test and reaction scale, the researcher conducted a post-experimental interview with the student-teacher educators. Twelve Student Teacher Educators from the experimental group were randomly selected by the researcher to conduct the post-experimental interview. The interview schedule had 23 questions of mixed nature including both open-ended and close-ended questions. The main aim of conducting the interview was to the know experience of the Student Teacher Educators in learning through MOOCs, the challenges faced by the Student Teacher Educators during the implementation of the MOOC, and also their

suggestions for future developers of a MOOC and prospective learners in MOOC in future. The interview was conducted via phone and each interview lasted for around 30 minutes. Every student-teacher and educator explained the purpose of conducting the interview and permission was taken for recording their voice for analysis purposes. The student-teacher educators were asked to be honest during the interview. The interview began with some general question about their educational qualification and experience and later open-ended questions related to challenges, experience, and suggestion was taken into account. Probing was done wherever the researcher felt that the student-teacher educators is stuck. The recordings were saved for analysis at a later stage.

3.20.0 PROCEDURE FOR DATA ANALYSIS

In order the determine the effectiveness of the developed MOOC the data collected through achievement tests, reaction scales, and post-experimental interviews were analysed and interpreted. The researcher used the Mann Whitney U which is a non-parametric equivalent of a t-test and is used when purposive or convenience sampling is used instead of random sampling to test the hypothesis. Achievement test scores of the control and experimental group were analysed using the Mean, Standard deviation, and Standard error of the mean. To analyse the reaction scale Frequency, Percentage, and Intensity Index(II) were used. The data collected from the post-experimental interview schedule was analysed using Content Analysis.