

**DEVELOPMENT OF A SCALE TO ASSESS TEACHERS'
ATTITUDE TOWARDS MOOCS**



A

DISSERTATION

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CERTIFICATE

This is to certify that Ms. Divya Varsha Dutta, student of M.Ed. Semester IV, Session 2018-2020, bearing Roll No. 1801002 has worked under my supervision for her dissertation entitled:

**“DEVELOPMENT OF A SCALE TO ASSESS TEACHERS’
ATTITUDE TOWARDS MOOCS”**

Her dissertation is fit for submission in partial fulfillment of the requirement for the award of the Degree of Master of Education.

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ABBREVIATIONS

MOOCS	Massive Open Online Courses
cMOOC	Connectivist-MOOC
xMOOC	Extended-MOOC
SA	Strongly Agree
A	Agree
U	Undecided
DA	Disagree
SDA	Strongly Disagree
TAMS	Teacher Attitude towards MOOCS Scale
HEI	Higher Education Institution
SD	Standard Deviation
df	Degree of Freedom
Sig.	Significant
SPSS	Statistical Package for Social Science

ABSTRACT

MOOC as a latest innovative techniques and tools of teaching and learning is one of the modern method of learning and getting education which provides free, easily accessible, completely online courses, which offer one the opportunity to study with top universities around the world. An attitude is a way of feeling or acting toward a person, thing or situation. Passion for a sport, dislike for a certain actor and negativity toward life in general are each an example of an attitude. So, it is very important to assess the attitude of someone towards a particular thing. The present study has been conducted by the investigator to develop a scale and assess the attitude of teachers towards MOOCs. It is useful to know the opinions, likes-dislikes, curiosity, and willingness of teachers about the MOOCs. For this study, the investigator has followed the different steps of Likert's Scale to prepare a tool for the collection of data to measure attitude. In first draft, a tool containing 110 items on attitude has been prepared and after following all steps of construction of a scale, 50 items have been selected and finalized for the data collection. The present study primarily descriptive in nature has completed through a survey to assess teachers' attitude towards MOOCs. First draft has been given to one individual and after the revision second draft has been distributed to conduct a small group try out on a sample of 19 teacher educators teaching in undergraduate and postgraduate departments of a college of education. After initial analysis, the Attitude Scale has been converted into Online Version also and the tool was named as 'Scale for Teachers' Attitude towards MOOCs (STAM)'. The data has been collected from 270 teachers of higher institutions for standardizing the scale and computing reliability and validity coefficients. The reliability coefficients computed for the scale have been found to be 0.78 (Alpha) and 0.5 (Split Half). The discriminant validity coefficients have been found to range from 0.35 to 0.89. The other results showed that the attitude of teacher towards MOOCs' has been found to be positive. SWAYAM and Google Education have been found to be most popular and most used platforms by teachers of higher institutions. Teachers have agreed that cost effectiveness, job opportunity, knowledge of ICT skills and degradation of old value system are important factors in MOOCs. Significance differences have been found to exist in teacher educator's attitude towards MOOCs with respect to their age and teaching experience.

CHAPTER- 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Education is vital to the pace of the social, political and economic development of any nation, so vital is the mode through which education is being imparted. Face to face as well as online or distance modes of education are equally contributing towards betterment of our educational growth. Face to face method is well tested and tried method of imparting education for past many centuries and it is still prevailing in whole world. On the other hand, technology is available in abundance these days and it has presented educational field with the latest innovative techniques and tools of teaching and learning which can do wonders if utilized appropriately.

Online mode of education is very famous in 21st century. So, MOOCs are a good platform for online education. MOOCs provide a relevant material to the user and it is totally free of cost. A massive open online course is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials, such as filmed lectures, readings, and problems sets, many MOOCs provide interactive courses with user forums to support community interactions among students, professors, and teaching assistants, as well as immediate feedback to quick quizzes and assignments. MOOCs are a recent and widely researched development in distance education, first introduced in 2006 and emerged as a popular mode of learning in 2012.

An attitude is an evaluation of an attitude object, ranging from extremely negative to extremely positive. Most contemporary perspectives on attitudes also permit that people can also be conflicted or ambivalent toward an object by simultaneously holding both positive and negative attitudes toward the same object.

1.2 MASSIVE OPEN ONLINE COURSES (MOOCs)

MOOC is the one of the modern method of learning and getting education. MOOC stand for “Massive Open Online Course.” This term originated in the US in 2008, to describe free, easily accessible, completely online courses, which offer one the opportunity to study with top universities around the world. Massive refer to level

giving chance for relations between participants. Open doesn't mean just free but refers to open access, open syllabi and self -going to learning outcome. Online point to creation resources obtainable on internet in great quantity, and Course referring to arrangement of the online classes. A key characteristic of a MOOC is elasticity so that students can decide their level of contribution in an "a la carte" manner with no fees and any fundamentals other than internet admission and awareness, no predefined expectations for donation comprise no formal authorized sanction". The first MOOC was a course on Connectivism and Connective Knowledge (CCK08) in 2008 by George Siemens and Stephen Downes and is distinguished from other MOOCs as cMOOC. cMOOC way Connectivist-MOOC emphasize on its circulated participatory networked learning. The Massive Open Online Course (MOOC) has been a popular topic recently, which has led to a great deal of interest and research. 'Massive' refers to the large number of students who are able to enroll in online courses compared to the relatively small number of students in traditional classrooms. 'Open' means that the course is not restricted to users within a school or organization like a university course or a corporate private training session. 'Online' means that the course is organized or distributed on the web. 'Course' indicates that instead of simply uploading all materials online, a MOOC has certain topic coverage, some structure and organization, one or more instructors, and students participating in course activities. Pappano (2012) referred to the year of 2012 as an important MOOC year indicating the prevalence of this phenomenon in The New York Times.

MOOCs are open and accessible to large numbers of learners from diverse backgrounds, with the only restrictive factor being access to an internet-enabled electronic device. Characteristically, MOOCs are base approximately straight higher education programmes and combine video-based lecture substance, automatic online assessment, and conversation for a for learners to employ with in a personalized way that suit their individual desires.

Massive open online courses (MOOCs) have seen extraordinary climb in the previous little years as an average of deliver value course contented to learners at their entrance way. In general, a MOOC is composed of a series of educational material hosted on an Internet site, accessible to students through its devices. The popularity of MOOCs is due to the fact that they are online and open the characteristics that allow students from

all over the world to register freely. A large number of these courses are offered for free and a student can choose and choose all the courses he wants. Thanks to its practicality and attractiveness, some of these courses have attracted thousands of students and, therefore, have been recognized as enormous.

The structure of a typical MOOC consists of a course lasting a few weeks. The course is divided into weekly modules. Each module analyses one or more topics related to the topic. The teaching format is through videoconferences, demonstrations, essential readings and questionnaires. Students can post their questions and opinions in discussion forums moderated by content providers. Courses generally require 3 to 10 hours of participation by participants per week. Participants' assessment is usually done through multiple-choice questions, extended-answer questions, and true and false questions. Some courses also include essays, peer reviews and writing programs as part of their evaluation process. However, the assessment of such presentations by a large number of students is usually performed by colleagues or automated computer programs. Participants who successfully complete the course are issued certificates. Participation in a MOOC is generally open to all, although some courses specify familiarity with a particular skill (for example, programming in a particular language for a MOOC in computer science).

The Indian government has also started more than 350 courses online through the Active - Learning study networks for young candidates - SWAYAM. Online sources such as Coursera, Edx and SWAYAM, UGC and other educational authorities are trying to create a solid systematic framework for validating and recognizing the implementation of the courses offered by the cooperation of these institutions. Higher education has been around the world for centuries, and today, due to cost, it faces a huge dilemma among students with a huge debt burden. By definition, MOOCs take place online. They could be affiliated with a university, but not necessarily. These days, most of the prestigious universities offer a large number of students the opportunity to study high quality courses online often at free of cost.

Class-Central website (2019) shows that there are 880 universities which offers MOOCs courses Few of them are Massachusetts Institute of Technology provides 188 Courses, Stanford University provides 177, Harvard University provides 151, University of Pennsylvania provides 150, University of Michigan provides 148, Indian

Institute of Technology, Kharagpur provides 82, Indian Institute of Technology Madras provides 81, Indian Institute of Technology Kanpur provides 79, Indian Institute of Technology Roorkee provides 39, Indian Institute of Management Bangalore provides 35, Indian Institute of Technology Bombay provides 32, Indian Institute of Technology Guwahati provides 15, Indian Institute of Science Bangalore provides 9, Indraprastha Institute of Information Technology Delhi provides 1, Indian Institute of Science Education and Research, Mohali provides 1, Indian Institute of Technology Patna provides 1, Indian Institute of Technology, Ropar provides 1 by the year 2019.

They are model for free study and user can choose courses from any organization offer them. MOOCs do not forever lead to proper education. There is no entry requirement. MOOCs offer communication several through examine review and group teamwork or mechanical feedback through object, online assessment (with quiz and exam). As most courses are free of charge, a few are fee-paying. Videos are normally short and much activity takes place on online discussion groups and forums.

Early MOOCs often emphasized open-access features, such as open licensing of content, structure and learning goals, to promote the reuse and remixing of resources. Some later MOOCs use closed licenses for their course materials while maintaining free access for students.

During the past two years, Massive Open Online Courses (MOOCs) have created wide interest in the academic world raising both enthusiasm for new opportunities for universities and many concerns for the future of university education. The discussion has mainly appeared in non-scientific forums, such as magazine articles, columns and blogs, making it difficult to judge wider opinions within academia. To collect more rigorous data we surveyed teachers, researchers, and academic managers on their opinions and experiences of MOOCs. In this study, analysis of responses from the computer science academic community (n=137) was done. Their feelings about MOOCs were highly mixed. Content analysis of open-ended questions revealed that the most often mentioned positive aspects included affordances of MOOCs, freedom of time and location for studying, and the possibility to experience teaching from top-level international teachers/experts. The most common negative aspects included concerns about pedagogical designs of MOOCs, assessment practices, and lack of interaction

with the teacher. About half the respondents claimed they had not changed their teaching as a result of MOOCs, a small number used MOOCs as learning resources and very few were engaging with MOOCs in any significant way.

1.2.1 History of MOOCs

The first MOOC was conducted in the year 2008, though its idea was sown much before. Hence it is safe to say that it is a very young pedagogy. MOOC's are showing tremendous growth in number, enrolments, participation, types etc.

Dave Cormier and Bryan Alexander coined the acronym MOOC to describe the course "Connectivism and Connective Knowledge" (CCK08) launched by Stephen Downes and George Siemens at the University of Manitoba in 2008. Motivated by the achievement of the Stanford MOOCs, Sebastian Thrun and Peter Norvig happening thoughts concerning the MOOC industry models and launch Udacity as a MOOC income model in 2012. Stanford professors, Daphne Koller and Coursera, made the collaboration with recognized universities to provide a platform for online courses with the aim of providing high quality education to interested students worldwide. Though MOOC have their own course objectives to achieve their course goal.

1.2.2 Definitions of the MOOC

In the words of Thompson Kevin, a proponent of MOOC, "Massive Open Online Course (MOOC) is a model for delivering learning content online to virtually any person with no limit on attendance who wants to take the course. Participants can be students enrolled at the institution hosting the MOOC or anyone with Internet access. They are available to a massive audience, in that thousands of people take the course simultaneously. The first massive open online course that Stanford University offered free had more than 160,000 enrolled students representing every country in the world except North Korea.

The "open" students, who pay nothing to participate, can join in some or all of the course activities, with open engagement at all levels, there are no barriers between in-out. Any learner can enroll in any course if she/he is interested in topic and also can exit the course. "Open" ness refers to no requirement of qualification or previous

knowledge for enrolment. There are no boundaries to enrolment in terms of age, locations, race or gender. Due to openness characteristic the information flows freely and knowledge creation and knowledge sharing is assured which might include watching videos, posting on discussion forums and blogs, and commenting via social media platforms. Although “open” participants receive no credit for the course and may get little or no direct feedback from the instructor, their involvement can add a new-dimension to the course that benefits all students”.

The MOOC territory is largely a space for innovation and experimentation, and what is considered a MOOC is still open to interpretation. MOOCs can be defined in many different ways. The literature review provides some of the definitions proposed.

Massive: Massive mean large which include the large number of enrolment in the course at the same time.

Open: access to the course is free, and there are no entry qualifications.

Online: the full course is available through the Internet (using a laptop or desktop computer, a tablet computer or a smart phone).

Course: the submission is a course, sense that it offers an entire learning understanding i.e., it is structured around a set of learning goals in a defined area of study and includes the course materials, assessment tools such as quizzes, feedback, an examination and a certificate of completion.

According to Wikipedia: A massive open online course (MOOC) is an online course aimed at interactive participation on a large scale and open access through the web. MOOCs are a new growth in distance teaching.

According to Techopedia: MOOCs are a recent progression in distance education. The MOOC construct was born in 2008 between the movements of open academic resources (REA). Most of the initial courses are influenced by the connectivist theory that emphasizes that data and learning derive from a network of relationships or connections. 2012 was associate degree exceptional year for MOOCs, as business has attracted nice interest in working capital assets and interests. Several suppliers connected with the simplest universities have emerged; a number of these embrace edX, Coursera and Udacity.

Selwyn, Bulfin and Pangrazio (2015): State that “MOOCs are courses accessible to ample of on-line learners for slight or no cost.

Commonwealth of Learning (2015): Proposes a definition that already includes some specification “A MOOC is a web course which needs no previous qualifications for entry one will accessed it by net association.

Oxford Dictionaries Online: A categories of learn created accessible higher than the net with no charge to an extraordinarily large numeral of citizens: anybody UN agency attempt to take a MOOC strictly logs on to the web site and signs up.

1.2.3 Types of MOOCs

MOOCs are divided into two type i.e.cMOOCs and xMOOCs, all of which have significant theoretical differences. In this regard, MOOCs must be analyzed and evaluated based on learning theories such as behaviourism, cognitivism, constructivism, and connectivism.

cMOOCs

Many sources refer to cMOOCs as connectivist MOOCs or as Canadians MOOC. The reasoning behind this is that the creators of MOOCs are Canadian researchers George Siemens, Stephen Downes, and Dave Cormier, and that they prepared the concept based on the principles of the theory of connectivism. Before further study of the history and definition of cMOOCs, an overview of the theory of connectivism, its basic principles, and its relationship with other theories can be considered useful for a better understanding of MOOCs. Anderson and Dron (2011) divide distance education pedagogy into three categories: cognitive behaviorism, social constructivism, and connectivism. Their definition of cognitive behaviorism refers to the pre-web period of printed materials, television, and radio; social constructivism is defined as the web 1.0 and teleconference period; connectivism refers to the communication and interaction process provided by web 2.0 and social networks. Connectivism is a new learning theory of the digital age and its principles have been developed by George Siemens. It is still widely discussed. Siemens (2004) states that behaviorism, cognitivism, and constructivism are insufficient in that they were developed in an era in which technology was not as developed and influential on education. The learning process in connectivism takes place as the learner feeds their knowledge through making

connections with the collective knowledge of the community. These connections are established in a biological/neural, conceptual, and social/external context. Connectivists state that learning is not merely the transfer of knowledge from the teacher to the learner and does not take place in a single environment, instead they state that knowledge is transformed and transferred through the interactions of people, especially in a web environment. The theory of connectivism indicates that each individual is responsible for their own learning. In cMOOCs, each learner structures and manages their own learning. They establish their personal learning network through nodes and connections. cMOOCs may be considered extensions of personal learning environments (PLE) and personal learning networks (PLN). Kop (2011) indicates that the first cMOOCs were similar to the environments denoted as personal learning networks. cMOOCs employ a system in which rather than being limited, the learner is free throughout the learning process, allowing them to determine their own learning goals. Just as this situation has its advantages, it may be stated that this situation makes the assessment and evaluation along with the certification processes quite difficult. In addition, due to the open nature of courses, monetary gain from these systems are also quite difficult. Downes (2013) established a chronological list of opened cMOOCs. The first cMOOC, dubbed “Connectivism”, opened in the fall semester of 2008. Compared to xMOOCs, cMOOCs have an earlier history and trend towards opening more courses in the future.

xMOOCs

xMOOCs, or as some sources call them, Coursera type MOOCs have become the single referred concept regarding the term MOOC in most literature. Despite cMOOCs being established earlier, in recent years the term MOOC has referred mostly to xMOOCs. xMOOCs are basically systems in which the instructor provides video presentations to teach the course while each student follows their coursework at their own learning speed. Courses from a variety of fields from Social Sciences to Computer Sciences, Medical Training to Educational Sciences are offered on these sites. The most well-known xMOOCs are sites such as Coursera, edX, Udacity, Udemy, Khan Academy, and Venture Lab. The courses sections of these sites allow participants to take any course they wish, conduct their assignments and quizzes, and complete the course program in a given amount of weeks merely by signing up as a member. These sites generally do not provide any formal degree or diploma. Thus the main purpose of

participation in MOOCs is learning the subject rather than attaining credits or proficiency. All xMOOC sites have a different method of operation. For example to take a course through Coursera, one must follow the pre-determined schedule, while Udemy has no such limitation. In addition, there are for-profit and non-profit MOOCs. For example edX is non-profit while Coursera is a for-profit organization. Despite being a paid service, Coursera does not charge any fees throughout the trial period and for course access. Coursera and its associated establishments cover their own costs. Coursera operates on a venture capital model. Beyond this, users may receive certificates from courses they have completed through certain donations or by paying certain fees, and they may also be referred to employers or have their competences assessed and evaluated in physical campuses and classrooms, again in return for certain fees. However the infrastructure and financial support required to offer these courses are mostly provided by large corporations and foundation donations. MOOCs gather a large amount of quantitative data regarding student behavior through their great number of participants. This data may be used to better understand the teaching process and how cognitive development takes place. Despite small differences, these sites generally have a similar understanding in that they share the characteristics of a traditional behaviorist approach. The instructor prepares the course through a video or presentation while the learner passively receives the course. Bates (2012) states that Coursera type xMOOCs designed in accordance with the old-fashioned traditional behaviorist model are systems in which information is directly transmitted rather than environments in which critical, creative, and unique thinking skills are developed. The behaviorist model is primarily based on the transfer of information from the teacher to the student. This situation reduces the students to a position in which they merely receive information, preventing their creativity and cognitive development. In xMOOCs, information is transferred from instructors to students through video courses and the learners are later evaluated through various tools. xMOOCs are criticized regarding their dated theoretical basis. Siemens (2012) states that “our MOOC model emphasizes creation, creativity, autonomy, and social networked learning. The Coursera model emphasizes a more traditional learning approach through video presentations and short quizzes and testing. Put another way, cMOOCs focus on knowledge creation and generation whereas xMOOCs focus on knowledge duplication. I’ve spoken with learners from different parts of the world who find xMOOCs extremely beneficial as they don’t have access to learning materials of that quality at their institutions.

xMOOCs scale, they have prestigious universities supporting them, and they are well-funded.” Interpreting Siemens’ (2012) statements at this point, he emphasizes that while they were the ones to initiate the MOOC movement, connectivist MOOCs engage the learner more actively than xMOOCs with traditional approaches. Downes (2012) also states that current xMOOCs may transform into cMOOCs in the near future. xMOOC is a concept that has recently greatly influenced the realm of distance education, and is constantly the subject of news and publications. It truly has the potential to revolutionize higher education in the future. It must be stated that online courses are not necessarily a new development. The Phoenix and DeVry universities were large commercial establishments that opened credited courses on the Internet. Students were already passive in classroom lectures, and these lectures had video versions in online classrooms. Basically not much had changed. Through MOOCs, however, the video presentations of the professors were enriched with practices and quizzes during and after the class, placing the focus on the understanding and comprehension skills of the students. MOOCs do have many aspects that need development and correction. MOOCs are still vague regarding the execution of any meaningful evaluation. In this regard, advanced learning analytics and peer review approaches have been considered but have yet to achieve any broad application. Individuals undertaking courses from MOOCs must have a basic level of digital literacy, and they must be able to take responsibility for their own learning. In addition, the employment aspect following course completion is still ambiguous, as are the subjects of formal diplomas and accreditation. It appears that the dropout rate for courses is also quite high. Certain arrangements must be made to ensure that users remain committed to their courses

1.2.4 Features of MOOCs

All MOOCs having the following characteristics:

Autonomy

The structure is conceived to promote autonomous learning with a number of resources in the form of videos, links, documents, etc. and spaces for debate and communication.

Massive

The number of places on courses is unlimited, the scope is global and the courses are

aimed at people with different interests and aspirations.

Online

To take these courses all you need is a computer, smart phone or tablet with internet connections and the use of a global web server (most platforms offer free apps). One can learn at home conveniently, flexibly and at your own pace.

Open and Free

The course materials are available on internet and are all completely free (some courses, few, offer free access to contents, but the assessments submission is possible only after buying a certificate). Students just have to register beforehand.

Downes (2007a, 2008, 2009b) has suggested that the key characteristics of an online course using connectivist principles are autonomy, diversity, openness, connectedness and interactivity. The other key characteristics of a MOOC are:

1. Liberty of choice: MOOCs allow learners to choose where, when, how, with whom and even what to learn. There is a maximum power to learners to choose what they want to learn.
2. Diversity: MOOCs get variety of learners from all corners of the world. This helps in getting diverse thinking, diverse readings. It also helps in quality of discussions and learning environment.
3. Connectedness: In the digital era, people are constantly connected and interact with each other. These connections and interactivity lead to knowledge building.
4. Self-paced: MOOC's provide the autonomy to learners to decide how and when they like to learn. MOOC's contain documents for self- learning, 34 videos, links, discussions, quizzes, debates that can be accessed anytime by the learners.
5. Badges and Certificates: Most MOOCs award some kind of recognition for successful completion of a course, based on a final computer-marked assessment. Digital badges or certificates are validated indicator of accomplishment, skill, quality, or interest that can be earned in many learning environments.
6. Lifelong learning: Learners improve their lifelong learning skills, as participating in a MOOC enables learners to think about their own learning and knowledge absorption.

1.2.5 Factors affecting MOOCs

Psychological

The attitude of a person is determined by psychological factors like ideas, values, beliefs, perception, etc. All these have a complex role in determining a person's attitude. Values are ideals, guiding principles in one's life, or overarching goals that people strive to obtain.

Family

Family plays a significant role in the primary stage of attitudes held by individuals. Initially, a person develops certain attitudes from his parents, brothers, sister, and elders in the family. There is a high degree of relationship between parent and children in attitudes found in them.

Society

Societies play an important role in formatting the attitudes of an individual. The culture, the tradition, the language, etc., influence a person's attitudes. Society, tradition, and the culture teach individuals what is and what is not acceptable.

Economic

A person's attitude also depends on issues such as his salary, status, work environment, work as such, etc.

1.2.6 Functions of MOOCS

Daniel Katz classified attitudes into four different groups based on their functions:-

1. Utilitarian: provides us with general approach or avoidance tendencies
2. Knowledge: help people organize and interpret new information
3. Ego-defensive: attitudes can help people protect their self-esteem
4. Value-expressive: used to express central values or beliefs

Utilitarian

People adopt attitudes that are rewarding and that help them avoid punishment. In other words, any attitude that is adopted in a person's own self-interest is considered to serve a utilitarian function.

Knowledge

People need to maintain an organized, meaningful, and stable view of the world. That being said important values and general principles can provide a framework for our knowledge. Attitudes achieve this goal by making things fit together and make sense.

Ego-Defensive

This function involves psychoanalytic principles where people use defence mechanisms to protect themselves from psychological harm.

The ego-defensive notion correlates nicely with Downward Comparison Theory which holds the view that derogating a less fortunate other increases our own subjective well-being. We are more likely to use the ego-defensive function when we suffer a frustration or misfortune.

Value-Expressive

- Serves to express one's central values and self-concept.
- Central values tend to establish our identity and gain us social approval thereby showing us who we are, and what we stand for.

1.3 ATTITUDE TOWARDS MOOCs

Attitudes are fundamental determinants of our perceptions of, and actions toward all aspects of our social environment. Attitudes involve a complex organization of evaluative beliefs, feelings and tendencies toward certain actions.

How much we like or dislike something determines our behavior towards that thing. We tend to approach, seek out or be associated with things we like; we avoid, shun or reject things we do not like.

In psychology, attitude is a psychological construct, a mental and emotional entity that inheres in, or characterizes a person. They are complex and an acquired state through experiences. It is an individual's predisposed state of mind regarding a value and it is precipitated through a responsive expression towards a person, place, thing, or event which in turn influences the individual's thought and action. Prominent psychologist Gordon Allport described this latent psychological construct as "the most distinctive and indispensable concept in contemporary social psychology." Attitude can

be formed from a person's past and present. Key topics in the study of attitudes include attitude strength, attitude change, consumer behavior and attitude e-behaviour relationships.

Jung's definition of attitude is a "readiness of the psyche to act or react in a certain way".

An attitude is an evaluation of an attitude object, ranging from extremely negative to extremely positive. Most contemporary perspectives on attitudes also permit that people can also be conflicted or ambivalent toward an object by simultaneously holding both positive and negative attitudes toward the same object. This has led to some discussion of whether individual can hold multiple attitudes toward the same object.

An instrument, usually a questionnaire, designed to measure a person's position on some dimension. Examples: Intelligence scale; conscientiousness scale; self-esteem scale, etc. Can be responded to by oneself or by others – yielding what is called self-report or other-report.

Attitude will have three components

- 1. Cognitive:** It involves the knowledge or information about a person or object, etc., and his belief about it.
- 2. Affective:** Refers to feeling aspect, i.e. how he feels about it
- 3. Conative:** Refers to action tendency, i.e. how he behaves with it

1.3.1 Types of Attitudes

Attitudes are of three types:

- a. Positive:** A favourable attitude—liking people, objects, situation, etc.
- b. Negative:** An unfavourable attitude—does not like people/ objects, etc.
- c. Neutral:** Neither favourable nor unfavourable.

Likert suggested the use of an attitude-scoring technique that is simpler than the Thurstone method and is regarded by many as at least as reliable. Each item, or

statement, in the attitude scale is followed by five responses, one of which is checked by the subject. The responses, indicating degree of strength of attitude, are:

strongly agree (SA), agree (A), undecided (U), disagree (D), or strongly disagree (SD).

Arbitrary scoring weights of 1,2, 3, 4,5 can be assigned for the respective responses. An individual's score on a particular attitude scale is the sum of his ratings on all items.

Attitude Scale

The attitude scale is a special type of questionnaire designed to measure people opinion on any special issues or event that is called attitude scale. The use of attitude scales are used to rank of peoples judgments of objects, event, or other.

1.3.2 Development of an Attitude Scale

There are different steps to develop an attitude scale:

Discussion: Informally discuss the issues with the experts, teachers, peers and also consult secondary sources. For example, if an investigator wants to develop a scale on attitude of teachers, discuss the topic with teachers, experts in the field such as degree college teachers, education college teachers and university teachers.

Review: Review related literature to the particular topic of interest. Refer journals, books, articles, dissertations, research papers and net sources. Literature review helps in the process of item generation for the scale.

Writing statements: Based on the discussion and extensive review, collect a set of such statements on the issues. Make the items simple and straight forward so that respondents are able to fill out the scale quickly and easily.

Writing positive and negative statements: Write acceptance or rejection statements, it could imply a different degree of favourable or unfavourable attitude towards the issue in which an investigator intended to assess. Statement or item could be positive or negative. Positive statements should be objective statements which are acceptable by those having the favourable attitude towards the particular issue and just as unacceptable to those not having it.

Create an item pool: Continue writing an items, both positive and negative, until item pool at least twice the size of instrument intended. For example, if an investigator plans to have 20 items in final scale, then create an item pool of 40 items.

Editing of items: After having collected as many relevant statement as possible, the next step is to go through each item carefully.

Criteria for editing:

- Avoid the statement which refer to past rather to present.
- Avoid using statements that are factual or capable of being interpreted as factual.
- Avoid irrelevant to be endorsed by almost every one or no one.
- Avoid irrelevant to the object under consideration.
- Avoid more than one thought and double negative statements.
- Avoid certain word that may not be understood by the respondents.
- Avoid certain such universals words such as all, always, none, never, often etc as these introduce ambiguity.
- Avoid such words as only, just, merely, etc.
- Avoid biased languages. It is important to avoid using emotional words or phrases in items.
- Avoid double barrel questions, where the item actually combines two different questions into one.

Rank/Order: After editing, select the items and give rating to the items. Rank orders the items on clarity and potency. Choose an equal number, five categories are fairly standard. Some scale constructors use seven categories and some prefers four or six response categories with no middle category. All of these seem to work satisfactory.

Scoring: The points given for response depend on whether the statement is positive or negative. The person who strongly agrees with a positive statement gets maximum points. One who strongly disagrees with a positive statement gets the minimum points. For the purpose of scoring, assign the numerical value of 5 to strongly agree, 4 to agree, 3 to undecided, 2 to disagree and 1 to strongly disagree.

Write instructions: Write instructions which clearly explain how to select response on the form. Write in simple and easily understandable language.

Formatting the scale: Randomly order the selected items. Use letters to indicate choices such as SA, A, U, DA, SDA.

Validity: Validity is the extent to which the measure provides an accurate representation of what one is trying to measure. Validity includes both systematic and variable error components. A systematic error, also known as bias, is one that occurs in a consistent manner each time something is measured. A variable error is one that occurs randomly each time something is measured.

Reliability: The term reliability is used to refer to the degree of variable error in a measurement. Reliability is the extent to which a measurement is free of variable errors. This is reflected when repeated measures of the same stable characteristic in the same objects show limited variation.

1.4 NEED AND SIGNIFICANCE OF THE STUDY

The use of technology opens new avenues in the field of education. The use of technology in education is driven and supported by evidence that new technologies can change colleges and improve education. Attitude is an organization of beliefs, habits, and motives associated with a particular object. It is generally believed that attitudes of teachers towards MOOCs may play a vital role in their development. MOOCs play an important role in every teacher's life. It is easier and convenient to access and provide information and communicate by a social media.

Teachers are connected to each other and can make good use of this platform for the working of their profession. MOOCs help teachers connect to their colleagues off campus as well as senior experts. One of the important advance is to encourage interaction between teachers. The rapid increase in use of information technologies throughout educational institutions is changing the way teachers work and establish collaboration. So studying attitude towards MOOCs may give insight to teachers, administrators, students and ever government authorities.

1.5 STATEMENT OF THE PROBLEM

DEVELOPMENT OF A SCALE TO ASSESS TEACHERS' ATTITUDE TOWARDS MOOCS

1.6 OPERATIONAL DEFINITIONS

MOOCs: A massive open online course is an online course aimed at unlimited participation and open access via the web. All the course run purely through online mode through any platform will be considered as MOOCs is the present study.

Teachers' attitude: Readiness of the psyche to act or react in a certain way towards MOOCs shall be considered as teacher's attitude in present study.

Scale: An instrument, usually a questionnaire, designed to measure attitudes towards MOOCs will be considered as a scale in the present study.

1.7 OBJECTIVES OF THE STUDY

The following are the objectives of the present study:

- i. To construct a scale on "Attitude towards MOOCs" for working teachers in Higher Education Institution.
- ii. To standardize teachers attitude scale on teachers working in Higher Education Institution.
 - a. Establishing the Reliability
 - b. Establishing the Validity
 - c. Setting up Norm
- iii. To develop material for a manual for the STAM
- iv. To study the level of Teacher's Attitude towards MOOCS
- v. To find out whether differences exist in teachers' attitude towards MOOCS with respect to their age, and teaching experience.

1.8 HYPOTHESES OF THE STUDY

- i. There is no difference in attitude scores of teachers teaching in higher education institutions with respect to their age.
- ii. There is no difference in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience.

1.9 DELIMITATIONS OF THE STUDY

The present study has been confined to

- i. 270 teachers working in Higher Education Institution (H.E.I).
- ii. Jammu city and its adjoining areas.
- iii. Those teachers who are using MOOCs for their study purpose.

1.10 CHAPTER SUMMARY

This chapter gives an outline of the background of the study, information about MOOCs, attitude and development of scale to assess teachers' attitude towards MOOCs. There are 5 objectives of the study and study delimited to 270 teachers working in higher education institutions of Jammu district. In this study, self-made tool is used to collect the data from different institutions.

CHAPTER -2

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

Survey of related literature equips the researcher with adequate information regarding the field in general and the problem in particular. It provides the researcher upto date information in the concerned field. It provides some insight regarding strong points and limitations of the previous studies and there by enables the researcher to improve his own investigations. Survey of related literature is considered the most important prerequisite to actual planning and conducting the study, because it gives a researcher upto date information about the literature, related to his own problem already partially done by others. The survey of related literature bridges the gap between new and old knowledge and new researcher will not feel that he has jumped from one shore to another but feels that he is doing his systematically and correctly. It is essential to the development of an effective approach to its solution. Old literature, in the problem and derivation of this way helps the researcher in the classification of his problem and in avoiding duplication. Thus survey of related literature, plays an important role in the research process. First of all, it helps in identifying and selecting a novel search problem. It provides the rationale or basis for the foundation of hypothesis. In the present study whatever related literature has been studied. It has no bearing directly or indirectly on the problem under investigation.

2.2 Studies on Attitude Scale

Singh (1969) studied on influence of intellectual development on the Aggressive Attitude. The findings of study were: (1) The relationship between general mental ability and hostility score was found to be negatively significant at all the grade levels except at grade X. (2) The general mental ability showed a significant increasing trend from one class-level to the next higher class level, whereas the mean hostility scores showed a decreasing trend. (3) The comparative study of two extreme upper and lower hostility groups in respect of their mean scores indicated that both of these groups did not differ at any level. This reflected the independent nature of the traits of general mental ability and hostility. (4) Among the obtained relationship between the hostility score and personality traits it was observed that hostility had a positive-relationship

with anxiety, annoyance and neuroticism, a negative relationship with historicism and social desirability tendency; whereas hostility had no significant relationship with depression-dislikes, likes and extraversion-introversion. (5) The comparative study of the two extreme groups-upper and lower in hostility at all the three educational levels revealed that the upper hostility group consistently and significantly scored higher as compared to the lower hostility group on anxiety, annoyance and neuroticism variables of personality, on the other hand, the lower hostility group showed a trend to score significantly higher on hystericism and social desirability tendency. (6) Persons of high hostility and intelligence were not found to be consistently discriminative on the various traits at the three educational levels. The only factor that tended to distinguish between these two extreme groups was social desirability, which was negatively related with hostility and also with intelligence at grade X and graduate level.

Saxena (1985) studied attitude towards Physics and cognitive Preference styles among Different groups of science students. The main objectives of the study were : (I) To develop a Physics cognitive preference Styles Test (PCPST) and Attitude towards Physics scale (ATPS), (II) To assess cognitive preference styles of different groups of science students of both sex studying in classes X and XI of central schools and schools of Rajasthan, (III) To assess the students attitudes to physics (IV) To study the relationship between attitudes and cognitive preference styles and (V) To study the main and interaction effects of 'class', 'sex', and type of school on attitudes and cognitive preference style. The findings were; (1) The cognitive preference style of the entire sample was found to be $R \rightarrow P \rightarrow A \rightarrow Q$ with maximum preference for 'Recall' and minimum preference for 'Questioning'. (2) The science students of different groups differed only in their 'principles' and 'applications' preferences for the second and third ranks only. (3) 'Class' and 'Type' of school had no effect on choices of preferences. However, male and female students were found to have $R \sim A \sim P \sim Q$ and $R > P > A \sim Q$ preference styles respectively. (4) The science students of all the eight groups were found to possess a favorable attitude towards physics. (5) The correlation coefficients between attitude towards physics scores and respective R,P,A and Q scores were found to be 0.58, 0.102 -0.25 and 0.005 respectively.

Norwich and Duncan (1990) studied attitude subjective -norm perceived preventive factors, intentions and learning science, testing a modified theory of reasoned action.

The study revealed that those pupils who reported that they had engaged in learning behaviour in the past had higher behaviors intentions. The most interesting finding in this study concerns the additional variable of perceived preventive factors. The evidence showed that it was possible to design a measure of preventive factors which was internally reliable and stable over a short period. Differences between pupils on this variable were mainly concerned with alternative personal interests and the adverse influence of friends and peers. Preventive-factors also had a negative, but low relationship with attitude to learning and over all past learning behaviour, though only the latter was statistically significant. In the partial co-relational analysis, it was found that by controlling for preventive factor and prior learning-behaviour, there was no longer a significant-relationship between attitude to learning science and perceived preventive factors continue to have significant independent relationships to behaviour intention.

Bharambe and Pandit (1991) studied attitudinal change -An experimental study. The objectives of the present study were to verify whether the change in attitudes could be induced experimentally and how the different independent variables interacted with the attitudinal change with respect to the extent, durability and direction of change. The result of this study indicate that the influence of treatments, sex and school atmosphere and their interactions are not reflected on the pretest score and change scores of the attitude towards cleanliness measured by the paper-pencil test. The effect of school atmosphere and sex is not noticeable in the pre-experimental stage where as the influence of school atmosphere was found in the change of attitude towards 29 cleanliness measured by the observation-cum-performance test. The significant interactions between school atmosphere and sex, and treatment and school atmosphere are observed on the first and second change of attitude towards work both measured by the paper-pencil test and the observation-cum-performance test. The experimental treatment shows their influence on the first change score of attitude towards work measured by the paper-pencil test. The significant interactions among school atmospheres, sex and treatment and between the school atmosphere and sex are explained on the first change, where as the significant interaction between treatment and school atmosphere is found on the second change of attitude towards work measured by the observation cum performance test. The influence of some of the

covariates' is referred in the results in spite of controlling, their effects on the dependent variables.

Sharma, Bhargava and Sinha (1993) studied career attitude and competency of intermediate students studying commerce and science-mathematics. On the basis of results, it was found that both the groups differed significantly at .05 level in respect of attitude C.R. value (2.04) and total competence C.R. value (2.01) variables of career. When competence were studied area ways, it was further revealed that out of five, significant differences were noticed in three areas. Science students showed better attitude and competence in planning and problem solving as compared to commerce students on the other hand commerce students expressed themselves in better self-appraisal competence.

Liaw and Huang (2011) explored individual's attitudes and behaviors in using e-learning with regard to gender difference, computer related experience, self-efficacy, and motivation aspects. The results demonstrate male students have positive e-learning attitudes than female students do, computer related experience is a significant predictor on learners' self-efficacy and motivation toward e-learning.

Bhuvaneswari and Padmanaban (2012) examined the attitude towards e-learning of secondary students of Delhi and found that demographic variables play a significant role for e-learning.

Upadhyaya (2013) conducted a study on 'attitude towards computer among B.Ed. students'. The findings of the study indicated that male and female B.Ed. students do not differ from one another on their attitude towards computer than their arts stream counterparts.

2.3 Studies on MOOCs

Daniel (2012) studies about Massive Open Online Courses (MOOCs) became a global phenomenon in 2012, there has been constant evolution in the way Higher Education Institutions (HEIs) make sense of them. HEIs embracing MOOCs have dedicated a variety of human resource to this venture. Only in a minority of cases, staff has been appointed exclusively to this role. In all other cases, MOOC related tasks have been

allocated to professionals who were already performing other educational tasks. This article contains a study that captures the experiences of these professionals in a Spanish university and a British university, as relates to their involvement in MOOCs. Interviews and group sessions were conducted to ascertain the influence of MOOCs in their practice, and in their opinions about the role of MOOCs in their institutions. The results seem to suggest that participants have positive attitudes towards incorporating MOOCs at the university, although they demand a serious bet for this educational approach from the strategic decision makers in the institutions.

Liyanagunawardena, Adams and Williams (2013) studies about massive open online courses (MOOCs) are a recent addition to the range of online learning options. Since 2008, MOOCs have been run by a variety of public and elite universities, especially in North America. Many academics have taken interest in MOOCs recognizing the potential to deliver education around the globe on an unprecedented scale; some of these academics are taking a research-oriented perspective and academic papers describing their research are starting to appear in the traditional media of peer reviewed publications. This paper presents a systematic review of the published MOOC literature (2008-2012): Forty-five peer reviewed papers are identified through journals, database searches, searching the Web, and chaining from known sources to form the base for this review. We believe this is the first effort to systematically review literature relating to MOOCs, a fairly recent but massively popular phenomenon with a global reach. The review categorizes the literature into eight different areas of interest, introductory, concept, case studies, educational theory, technology, participant focused, provider focused, and other, while also providing quantitative analysis of publications according to publication type, year of publication, and contributors. Future research directions guided by gaps in the literature are explored.

Baggaley (2013) shared the massive open online course (MOOC) approach has been accepted by universities around the world, and outsourcing companies have been launched to provide the infrastructure for it. Current press and blog coverage of the MOOC trend is examined and the range of reactions to it, most of them enthusiastic. MOOCs vary in their massiveness and openness, and in the extent to which they are courses; and a wide range of MOOCs is emerging under different names. These include xMOOCs, in which course content is defined by the course designers, and cMOOCs

featuring information generated by the students. The origins of the MOOC are examined, and its implications for the educational institutions that have specialized in distance education previously.

Kerdvibulvech (2013) referred to the interest of MOOC in that the creation of such a system encourages teachers and students in that they can communicate and interact with each other more. MOOC involves a computer system that allows teachers to maintain student interest and ensure retention. There is more interaction between instructors and students than in traditional courses, even though they are far apart.

Borden(2014), Decker(2014), Samuels, Shirky(2012) and Carey's (2013) debated about the advantages of MOOCs and their potential negative consequences, universities cannot ignore the impact of MOOCs have on higher education institutions. Therefore, it is important to explore the feasibility and advantages of MOOCs as part of the academic curriculum. And hence, the main goal of this research is to examine the feasibility of using MOOCs as a learning environment in academic courses. This debate will focus on the students who participated in the first two TAU MOOCs during the year 2013 – archeology and life sciences (the third is still ongoing). It will present the scope of student activity, the learning intensity, and learner path, in addition to attitudes of TAU students who participated in these courses as part of their curriculum for their degree.

Laisakul (2014) defined a Massive Open Online Course (MOOC) as a style of online learning course that is free and available through the Web, with regard to which there are many learners. It involves a forum for students to talk to each other, interactive classes, and there is homework. Students can consult with peers, professors and teaching assistants. The linchpin of MOOC is its accessibility, interactive element and freedom.

Margaryan, Bianco and Littlejohn (2015) shared an analysis of instructional design quality of 76 randomly selected Massive Open Online Courses (MOOCs). The quality of MOOCs was determined from first principles of instruction, using a course survey instrument. Two types of MOOCs (xMOOCs and cMOOCs) were analyzed and their instructional design quality was assessed and compared. We found that the majority of MOOCs scored poorly on most instructional design principles. However, most MOOCs

scored highly on organization and presentation of course material. The results indicate that although most MOOCs are well-packaged, their instructional design quality is low. We outline implications for practice and ideas for future research.

Salmon, Gregory, Lokuge, Dona, and Ross (2015) shared report on educators' experiences of a massive open online course (MOOC) focused on the Carpe Diem learning design process. The MOOC was developed in-house using Blackboard Course Sites by a university innovation and development unit, Learning Transformations, at Swinburne University of Technology in Melbourne, Australia. We report on a study of MOOC participants' experiences. Conclusions include illumination of MOOCs' value as professional development opportunities that can provide an authentic relevant experience for educators, as well as promote new skills in learning design and delivery for their own teaching. We propose that participation in relevant MOOCs may provide appropriate professional development for academics, and additionally encourage them to develop their teaching practices.

Rayyan, Fredericks, Colvin, Liu, Teodorescu, Barrantes and Pritchard (2016) studied three iterations of a Massive Open Online Course (MOOC) developed from online preparation materials for a reformed introductory physics classroom at the Massachusetts Institute of Technology, in which the teaching staff interact with small groups of students doing problems using an expert problem-solving pedagogy. The MOOC contains an e-text, simple checkpoint problems and homework. We show how certain course design aspects affect student behaviour: (a) frequent quizzes correlated with students reading a large fraction of the e-text, and (b) When homework sets are arranged by increasing (instructor-estimated) difficulty, we found strong correlations between difficulty and time to solution, but weak correlations with percent correct. Modifications to the second offering of the course resulted in higher retention. These modifications included targeting physics teachers and posting materials well in advance. We define retention as certificates earned relative to participants who make a significant effort on the second assignment. Retention measured this way varied between 44% and 72%, being highest in the course aimed at teachers. We show that there is significant learning among MOOC participants. Applying item response theory to common homework problems showed that the MOOC participants had significantly

higher ability than students in a Massachusetts Institute of Technology course and that they maintained this advantage over the duration of the MOOC.

Zhong, Zhang, Li and Liu (2016) conducted an investigation and mentioned in an article that open mass media online (MOOC) is the latest e-learning initiative to achieve great popularity in the world. Unfortunately, most of those studies are engineered from Western views. Therefore, there's a desire for a thematic and sensible analysis of connected studies to realize a higher understanding of MOOCs with Japanese views. During this paper, one study centered on exploitation the MOOC from the Japanese perspective. The most objective was to summarize the motivations and challenges of exploitation MOOCs, still on establish issues that haven't nonetheless been addressed or resolved fully. During this paper, they used completely different methodologies that enclosed the utilization of a form survey and activity knowledge analysis. The opined that results of this study might enhance our understanding of challenges of teaching and learning in MOOCs and facilitate educators develop MOOCs with Japanese insights.

Hakami, White and Chakaveh (2017) conducted research and mentioned in a document that the establishment and opening of online courses (MOOC) have become an important environment for learning with advanced technology (TEL) in which a large number of users from all over the world access content open, free and online, generated by world-class institutions. They mentioned that understanding students' motivations for using MOOCs is essential to deliver successful MOOC environments. This article presented a complete picture of the literature published between 2011-2016 and the motivations that lead people to use MOOCs as apprentices. They examined the classifications of the articles, the theories used, and the methods of data collection, the motivational factors proposed and the geographical distribution of the participants. The results show that the related literature is limited. Several articles have adopted theories on technological acceptance. Quantitative investigation was the preferred method for researchers. The key motivational factors were those related to the student (which are divided into personal, social and educational / professional development), related to the institute and the instructor, related to the platform and the course and to the perception of external control / facilitation related to conditions The identified studies have focused only on some geographical regions. These results are important for discovering the instructions in the literature and determining the current gaps that can be addressed in the future.

Zhu, Sari and Lee (2018) conducted research that explored the MOOC paradigms and research themes to gain a more in-depth understanding of the MOOC phenomenon by reviewing 146 empirical MOOC studies published from October 2014 to November 2016. The results show that: (a) most studies used quantitative research methods followed by mixed research methods and qualitative research methods, (b) the most frequently adopted data collection method was survey, followed by platform database, interviews, and discussion forum, (c) more than half of the collected studies used at least two data collection methods such as survey and interview, (d) the majority of researchers used descriptive statistics to analyze data, followed by inferential statistics and content analysis, and (e) the research focus was mainly on students, followed by design-focused, context and impact-focused, and instructor-focused. Among the focuses of this research, the conservation and motivation of the students were the most cited, followed by the experience and satisfaction of the students, evaluation and educational planning.

2.4 Chapter Summary

In the review of literature it is evident that, most of the studies depict the positive attitude of people towards MOOCs and there are so many studies found on the usage of massive open online courses by different type of users, and the result shows that the massive open online courses are very useful for each and every one in one or another way. It has also been found that it is very useful in every field of life but especially in the field of education. However, in most of studies were conducted on about MOOCs, Development of MOOCs, and Experiment on MOOCs, Impact of MOOCs and Effectiveness on MOOCs in these studies it has been found that student/teachers have found massive open online courses very helpful and effective in their respective fields of work. It is also important to note that review of research studies on usage of massive open online courses shows that that learner has found it very useful, beneficial and favorable in their life to access different types of courses of their interest as it is quite available on the massive open online courses platforms. As far as the present educational system is concerned it is very important for everyone to have knowledge about massive open online courses to compete with the world which is an age of technology.

2.5 The Present Study

In view of what is mentioned above, the researcher had decided to assess the attitude of the teachers of Jammu district towards MOOCS by constructing and standardizing an attitude scale namely Scale for Teachers' Attitude towards MOOCs (STAM) .

CHAPTER-3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research Design is an outline of how investigation will take place. It includes identifying the methods to be used for gathering information, type of tools to use or construct; how to administer the tool and the means for analyzing the data collected. This detailed outline will enable the researcher to work in a systematic manner. According to Kerlinger (1986), “A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme or program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data”.

For the present study, the Descriptive Research method is followed, as it is concerned with the current status of a phenomenon under study. Descriptive studies are one of the most widely used research method in education. It is one of the means through which opinions, attitudes, suggestions and other data can be obtained. According to John W. Best, “Descriptive research describes and interprets ‘what is’. It is concerned with conditions or relationships that exist; practices that prevail; beliefs, points of view or attitude that are held; processes that are going on; effects that are being felt; or trends that are developing.”

Descriptive Research may be classified into three categories: Survey studies, Interrelationship studies and Developmental Studies. The present study comes under the category of Survey studies. Survey studies are conducted to collect detailed descriptions of existing phenomena with the intent of employing data to justify current conditions and practices. It involves a clearly defined problem and definite objectives. It requires expert planning, careful analysis and interpretation of the data and logical reporting of the findings.

3.2 POPULATION

A population is any group of individuals that has one or more characteristics in common and that are of interest to the researcher. There are various ways to configure a population depending on the characteristics of interest. As the present study aims to assess teachers' attitude towards MOOCS, the population for the study include all the Colleges of Teacher Education, Degree Colleges and Universities of Jammu district.

3.3 SAMPLE OF THE STUDY

As populations tend to be very large, it usually is impossible for a researcher to examine every individual in the population of interest. Therefore, researchers typically select a smaller, more manageable group from the population and limit their studies to the individuals in the selected group. In statistical terms, a set of individuals selected from a population is called a sample. A sample is a small proportion of the population that is selected for observation and analysis.

Methods of Sampling- By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it was drawn. The process of such a selection is called sampling. Sampling methods fall into two categories i.e. non probability sampling and probability sampling.

In non – probability sampling, the units are selected at the discretion of the researcher. On the other hand in probability sampling, the units of the population are not selected at the discretion of the researcher but by means of certain procedures which ensure that every unit of a population has a probability of being selected. This method is also called random sampling. For the present study, simple or unrestricted random sampling is used. As this study requires the researcher to construct and standardize an attitude scale, there are three sets of sample which were selected for the different stages of test construction and standardization.

(a) Individual Try Out

The STAM containing 110 items on attitude has been administered on one teacher educator of MIER College of Education. The data collected helped in determining the level of understanding the appropriateness of the dimensions and the items of the Scale.

(b) Small Group Try Out

After revision, the STAM containing 60 items on attitude has been administered to a sample of 17 teachers of MIER College of Education. These teachers were from the U.G. and P.G. department of the college. At this stage, the data collected was used for item analysis to select statements for the final draft of the attitude scale. This was determined by applying computing the t-ratio as suggested by Edwards (1957).

(c) Final Field Try-Out of the Scale

After revision from feedback and item analysis results, the selected 50 items of the test was finally administered to a representative sample of 270 teachers which was randomly from the population of teachers working in Higher Education Institutions in Jammu district for establishing the parameters of validity, reliability and norms of the STAM.

The details of the distribution of the samples are given below in Table 3.1.

Table 3.1

Sample distribution

S.No.	Name of Colleges/University	No. of Teachers
1.	GCW, Parade	30
2.	University of Jammu	20
3.	Govt. MAM PG College	25
4.	MC Khalsa College of Education	30
5.	GCW, Gandhi Nagar	40
6.	Chenab College of Education	25
7.	Govt. College of Education	20
8.	Dogra College of Education	35
9.	RM College of Education	15
10.	Guru Nanak College of Education	30
Total	10	270

3.4 VARIABLES USED

A research question aims to ask about the relationship between two or more variables. In order to state the expected answer to the research questions, a research hypothesis is formulated which determines the expected relationship between the dependent and independent variables. In the present study, there are several dependent variables and one independent variable.

3.4.1 Independent variables

In the present study, the independent variables are age and teaching experience.

3.4.2 Dependent variable

In the present study, the dependent variable is attitude of teachers towards MOOCs.

3.5 TOOL USED

In order to assess teachers' attitude towards MOOCs, the researcher has been constructed and standardized the Scale for Teachers' Attitude towards MOOCs (STAM). Attitude scales were developed to provide a quick and convenient measure of attitudes that could be used with large groups. Attitude scales also provide us with one means of obtaining an assessment of the degree of affect that individuals may associate with some psychological object (Edwards, 1957).

There are various types of attitude scales that have been developed by psychologists and researchers to measure the attitudes of individuals. However the most widely used techniques are the 'Method of Equal- Appearing Intervals' and 'Method of Summated Ratings'. For this study, the attitude scale was developed by following the Method of Summated Ratings which was introduced by Likert (1932). In Likert Scale a statement is followed by the five responses; "strongly agree, agree, undecided, disagree, strongly disagree". The response categories may also be three or more than five, but the five point scale is the most widely used. Therefore, the Scale for Teachers' Attitude towards MOOCs (STAM) is a five point attitude scale which has been developed to measure the attitude of teachers working in higher education institution of Jammu district.

3.6 Method of Study

As the objective of the study has been to construct and standardize an attitude scale for the teachers towards MOOCS, certain materials were prepared for the test which includes the preparation of the booklet and the scoring key. For the preparation of these materials certain steps were taken to make the work more systematic.

The following materials have been prepared for the test

Booklet for the Scale- A booklet is prepared by the researcher which includes the final statements. Before using the booklet, the respondent has to provide a few personal information like their name, age, gender, educational qualification, designation (teacher/teacher educator) and teaching experiences. Specific instructions are given in the booklet on how to use it.

Manual for the Scale- The researcher has prepared a manual which include the following points:

(a) Introduction: The Scale for Teachers' Attitude towards MOOCs (STAM) has been developed with the aim of assessing the attitude of teachers towards MOOCS.

(b) Description of the Scale: The STAM is a Likert five point Summated Rating Scale.

(c) Scale Construction: The following steps were taken for the scale construction

- i. Preparation of the test items
- ii. Individual Try Out
- iii. Small Group Try Out
- iv. Final Field Try Out

The final scale consists of 50 items (36 positive statements and 14 negative statements).

(d) Administration: Proper directions were given before handing the tool to the respondents.

(e) Scoring: The 50 statements in the final scale and each statement is provided with five alternatives, namely- Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The highest score for STAM is 250 ($50 \times 5 = 250$), and the lowest score is 50 ($50 \times 1 = 50$). The Table 3.2 below shows the scoring procedure.

Table 3.2
Scoring Scheme for the Scale

Options	Positive statements	Negative statements
Strongly agree	5	1
Agree	4	2
Undecided	3	3
Disagree	2	4
Strongly disagree	1	5

- (f) Reliability: For establishing the reliability of the scale, the split half method, Spearman Brown formula and internal consistency Cronbach Alpha (α) was computed.
- (g) Validity: The face validity and the content validity were used to find out the validity of the scale.
- (h) Norms: In order to establish the norms, the raw scores obtained from the 270 samples are converted into percentile ranks.

3.7 COLLECTION OF DATA

The data was collected by administering the Scale for Teachers' Attitude towards MOOCs (STAM) constructed by the researcher to three set of samples.

- (a) Individual Try Out: The STAM was administered to a single teacher educator of MIER College of Education. The data collected help in determining the level of understanding the appropriateness of the dimensions and the items of the Scale.
- (b) Small Group Try Out: The STAM was administered to a sample of 17 teachers of MIER College of Education. These teachers are randomly selected from the U.G. and P.G. department of the college. At this stage, the data that was collected was used for item analysis to select statements for the final draft of the attitude scale. This was determined by applying the 't' ratio as suggested by Edwards(1957).
- (c) Preparing the Final Draft of Items: The selected items from the first try out are arranged in order of their difficulty value and discriminative value. After rejecting the inappropriate items, the final draft of selected items was prepared.
- (d) Final Field Try-Out of the Scale: The selected items of the test was finally administered to a representative sample of 270 teachers which was randomly from the

population of Teachers working in Higher Education Institutions in Jammu district for establishing the parameters of validity, reliability and norms of the STAM.

3.8 STATISTICAL TECHNIQUES USED

The following statistical techniques were used at different stages for analysing the data for the study:

(a) Mean $M = \sum X/N$

(b) Standard Deviation $\sigma = \sqrt{\sum X^2/N}$

(c) Pearson's Product Moment Correlation Method

For Split Half Test reliability coefficient, Pearson's Product Moment Method was computed with the following formula:-

$$r_{1/2} = \sum xy / \sqrt{(\sum x^2)(\sum y^2)}$$

Where,

$r_{1/2}$ = split half reliability coefficient of half test.

x = score of odd items.

y = score of even items.

(d) Spearman Brown Formula-From the half test reliability coefficient, the whole test reliability coefficient was estimated by using Spearman Brown prophecy Formula.

$$R = 2r_{1/2} / 1 + r_{1/2}$$

where,

R = Reliability coefficient of whole test.

$r_{1/2}$ = split half reliability coefficient.

(e) Cronbach Alpha- Cronbach Alpha is calculated for finding out the internal consistency of the scale.

$$\alpha = K/K-1(1-\sum Si^2/Sx^2)$$

where,

α = Coefficient, Cronbach alpha.

k = Number of items.

S_i^2 = Variance of overall score on the entire test.

S_x^2 = Variance of score on each item.

(f) 't' ratio - The 't' ratio as suggested by Edwards(1957) was used for item analysis to select statements for the final draft of the attitude scale.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where,

$\bar{X}_H$ = the mean score on a given statement for the high group.

$\bar{X}_L$ = the mean score on the same statement for the low group.

N = the number of subjects in the high and low groups.

X_H = score for a given statement in the high group.

X_L = score for a given statement in the low group.

(g) 't' ratio as suggested by Garrett for testing of null hypotheses

$$t = \frac{M_1 - M_2}{\sqrt{\sigma_1^2/N_1 + \sigma_2^2/N_2}}$$

where,

M_1 = Mean scores of the first sample

M_2 = Mean scores of the second sample

σ_1^2 = standard deviation of the first sample

σ_2^2 = standard deviation of the second sample

N_1 and N_2 = sizes of the sample

CHAPTER-4

CONSTRUCTION AND STANDARDIZATION OF ATTITUDE SCALE

4.1 INTRODUCTION

Every research work involves gathering of data which require the use of various tools and technique. Some of the major tools and techniques used for gathering data are Psychological tests, Inquiry forms, Observations, Interview and Sociometric Techniques. Psychological tests are among the most useful tools of educational research. They are used for evaluating or measuring behavior in a standardized way. One can select from the available tools or choose to construct his/her own tool according to the purpose of the study. This study involves assessing the attitudes of teachers towards MOOCs and for this purpose, the researcher had constructed an attitude scale. Many standard attitude scales have been developed to measure attitudes. However the most widely used techniques are the 'Method of Equal- Appearing Intervals' and 'Method of Summated Ratings'. Many attitude scale are also constructed for specific purposes. For this study, the attitude scale was developed by following the Method of Summated Ratings which was introduced by Likert (1932). For constructing a 'Scale for Teachers' Attitude towards MOOCs (STAM)', the following tasks were taken up.

4.2 PLANNING

The first task in the construction of an attitude scale is to formulate a plan. Construction of an attitude scale is a lengthy process which involves several procedures that needs to be followed in a systematic manner. Therefore the first step for any construction of a tool is to formulate a well thought out plan to avoid repetition of any step, survey or finding. Lack of proper planning in this type of research work gives room for unwarranted errors thereby resulting in insignificant results. For construction of an attitude scale, planning involves choosing the type of scale to follow, deciding the number of components as well as the number of items.

4.3 PREPARATION OF ITEMS

In order to measure the teacher's attitude towards MOOCs, the researcher collected and consulted relevant books, journals, articles, newspaper, etc. in order to collect statements which deal with attitude and MOOCs. A well-constructed attitude scale consists of a number of items that had been carefully edited and selected in accordance with certain criteria. The items making up an attitude scale are called statements. For editing the initial statements to be used in the construction of attitude scales, the following criteria listed by Edwards (1957) has been kept in mind by the investigator.

1. Avoid statements that refer to the past rather than to the present.
2. Avoid statements that are factual or capable of being interpreted as factual.
3. Avoid statements that may be interpreted in more than one way.
4. Avoid statements that are irrelevant to the psychological object under consideration.
5. Avoid statements that are likely to be endorsed by almost everyone or almost no one.
6. Select statements that are believed to cover the entire range of the affective scale of interest.
7. Keep the language of the statements simple, clear and direct.
8. Statements should be short, rarely exceeding 20 words.
9. Each statement should contain only one complete thought.
10. Statements containing universals such as all, always, none and never often introduce ambiguity and should be avoided.
11. Words such as only, just, merely and others of a similar nature should be used with care and moderation while writing statements.
12. Whenever possible, statements should be in the form of simple sentences rather than in the form of compound or complex sentences.
13. Avoid the use of words that may not be understood by those who are to be given the completed scale.
14. Avoid the use of double negatives.

Writing of Items

For preparation of tool, items were written by the investigator after reviewing the literature related to the present study from various resources and for this all above points

were also considered while framing the statements and its options. A title ‘Scale for Teachers’ Attitude towards MOOCs (STAM)’ was given to the scale. After the title, demographic data variables/ fields were framed and written. After the personal information, instructions for the participants were written before the tabular presentation of the attitude statements. In this table, a total number of 110 statements (84 positive and 26 negative statements) were written and typed and a printed format of whole scale was made ready.

Reviewing and Editing of the Test Items

For this, the next step was reviewing and editing the statements and other items written for the purpose. The draft containing the 110 statements was revised for a number of times for the content, language, nature of the items as well as for other mistakes in the statements by the investigator in consultation with her supervisor.

Preparing Instruction for the Test

Five types of responses were given for each statement- ‘Strongly Agree’, ‘Agree’, ‘Undecided’, ‘Disagree’, and ‘Strongly Disagree’. A Strongly Agree and Agree type of responses mean the expert agree with the statement, while other type of responses mean the expert disagree with the statement.

Scoring Procedure

The scoring procedure suggested by Likert (1932) for positive statements and negative statements has been followed by the investigator for this scale. This has been given in Table 4.1

Table 4.1
Scoring/weightage for Items

Options	Positive statements	Negative statements
Strongly agree	5	1
Agree	4	2
Undecided	3	3
Disagree	2	4
Strongly disagree	1	5

The draft containing 110 statements (84 positive and 26 negative) were written and typed and a printed format was made ready for the experts' view.

Agreement among Experts

The first draft containing the 110 statements was given to 5 experts in the field for analyzing the content, language, nature of the items as well as for editing the statements. An additional sheet was provided to the experts for their opinions, suggestions and necessary modifications for improving the statements, changing the structure of the statement or whether statements need to be omitted.

Simple frequency calculation has been used to find out how many statements are accepted and how many statements are to be omitted. Only statements having accepted by three experts were retained while others were discarded. Apart from the simple calculation of frequency, the statements were also omitted or rejected on the basis of (a) repetition, (b) ambiguity (c) overlapping of statements (d) statements not having any factual ground and (e) tough language.

Therefore, out of 110 statements included in the first draft, 60 statements were retained while 50 were rejected. Based on the feedback from the experts, some of the 60 statements were further modified and there were 38 positive statements and 22 negative statements in this revised draft.

The draft containing 60 statements (38 positive and 22 negative) was further modified and was edited and a second draft in printed form was subjected to individual administration.

4.4 INDIVIDUAL TRY OUT

The second draft of the tool was then administered to one senior teacher educator to determine the level of understanding of the appropriateness of the items of the Scale. Observations regarding method and duration of administration, reaction/problems while attempting the scale and suggestions after the completion of the scale were recorded by the investigator herself. Along with the suggestions and feedback received from the only teacher educator, some modifications were made with regard to length, sequence and font size of the statements and instructions. After editing, the third draft was made ready for administration on small group.

4.5 SMALL GROUP TRY OUT

For the try out, the attitude scale consisting of 60 statements was then administered to 17 teachers. At this stage, there are 36 positive statements and 24 negative statements.

Item Analysis

There are several methods of item analysis that may be used in evaluating the individual statements. For the present study, the method as suggested by A. L. Edwards (1957) was used. For the basis of rejecting statements, the frequency distribution of the scores based upon the responses to all the statements was taken. Edwards suggested that 25% or some other percentage of the subjects with the 66 highest total scores and lowest total scores must be taken. However, for the purpose of item analysis of this study the top 27% as well as the bottom 27% of the scores was taken aside. The t-values for significance of differences between the mean attitude scores of the top and bottom 27% group of respondents, that were indicative of their difficulty and discrimination values, were calculated for all the 60 statements. Even though a crude and approximate rule of thumb was to regard t-value equal or greater than 1.75 as indicating that the average response of the high and low groups to a statement differs significantly (Edwards 1957), in this case those items having t-value above 2.77 i.e. statements which are significant at 0.01 level of confidence were retained for the try out scale and statements having t-value less than 2.77 were then rejected. The t-value formula is used for item analysis is as follows

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where,

$\bar{X}_H$ = the mean score on a given statement for the high group.

$\bar{X}_L$ = the mean score on the same statement for the low group.

N = the number of subjects in the high and low groups.

X_H = score for a given statement in the high group.

XL = score for a given statement in the low group.

At this stage, item analysis was done component wise and the statements selected are those whose t-value is equal or greater than 2.77.

Subsequent to item discrimination, 10 statements were discarded and the scale now comprised of 50 statements.

4.6 FINAL FORM OF THE TEST

In the final form of the scale has three parts and these three parts were personal data, instructions and a table containing items and options. There were 50 items in the scale. Out of these 50 statements, 36 were positive and 14 were negative.

The final draft of the test was named as ‘Scale for Teachers’ Attitude towards MOOCs (STAM)’. The scale has been scored on a five point scale i.e. strongly agree, agree, undecided, disagree and strongly disagree. The score ranges from 1-5 for positive items respectively and it was reversed for negative items respectively. Therefore, the maximum possible score was 250 and the minimum score was 50.

4.7 FINAL FIELD TRY OUT (STANDARDIZATION OF THE TEST)

For the final field try out, the test was administered on 270 teachers of higher education institutions. The results have been given in the following paragraphs and in the next Chapter.

One of the main objectives of the study has been to standardize the scale that was constructed. Any test that is standardized has been carefully analyzed and validity and reliability as well as norms have been established by careful statistical controls. Hence in the present study, after construction of the test is completed, the next step is to standardize the test. For this the following procedures have been done.

1. Estimation of Reliability
2. Estimation of Validity
3. Estimation of Norms

1. Establishing the Reliability

Reliability refers to the extent to which a measuring device yields consistent results upon testing and retesting. In psychometric terminology, reliability means consistency of performance. Specifically, it refers to the consistency of the scores obtained by the same persons when re-examined with the same test on different occasions, or with different sets of equivalent items, or under other variable examining conditions (Annastasi, 1976). There are four procedures for computing the reliability coefficient of a test. These are Test- retest, Alternate or parallel forms, Split half technique and Inter rater reliability.

For finding out the reliability of the present scale, the Split Half Method has been used to estimate the internal consistency of the scale on a sample of 270 teachers of higher institutions. Split-half reliability is assessed by splitting the measures/items from the measurement procedure in half, and then calculating the scores for each half separately. Even though there are many options on how to split the measures/items, the common option is to compare odd- and even-numbered items/measures from the measurement procedure. This helps to avoid some of the potential biases that arise from simply dividing the measurement procedure in two. After dividing the measures/items from the measurement procedure, the scores from each of the halves is calculated separately by using Split Half test reliability coefficient which was computed by Pearson 'Product Moment Method.

From the correlation of the half- tests, the reliability coefficient of the whole test may be estimated by using the Spearman-Brown formula.

$$R = 2r^{1/2} / 1 + r^{1/2}$$

$$r = \frac{2r^{\frac{1}{2}}}{1 + 2r^{\frac{1}{2}}}$$

where, R= Reliability coefficient of whole test and $r^{1/2}$ = split half reliability coefficient.

In addition, Cronbach Alpha is also being calculated for finding out the internal consistency of the scale. It is the most common test score reliability coefficient for single administration. Cronbach's alpha coefficient is a test of reliability as internal consistency (Cronbach, 1951).

$$\alpha = K/K-1 \{1-(\sum S_i^2/S_x^2)\}$$

where, α = Coefficient, Cronbach alpha, k = Number of items, S_i^2 = Variance of overall score on the entire test and S_x^2 = Variance of score on each item.

Results

The analysis has been done by using Statistical Package for Social Sciences (SPSS). The results showed that the reliability of the half test is 0.775 and the reliability of the whole test is 0.830. Reliability of the test i.e. Cronbach's Alpha is 0.885. The thumb rule is that if the reliability is 0.7, then the test is considered to be reliable. Therefore, the values of reliability coefficient for this test is 0.83 and 0.89 respectively, thus, the scale has been found to be internally consistent.

2. Establishing the Validity

One of the important procedures for standardization of a test is to determine whether the test is valid or not. Validity refers to how well a test measures what it is purported to measure. The following types of validity have been used for this study.

- a) **Face Validity** -The face validity of the scale was confirmed on the basis of the opinion of the experts that it does convey the concept it purports to measure and has a logical link with the objectives.
- b) **Content Validity**- Content validity is estimated by evaluating the relevance of the test items in relation to objectives of the study. This form of validity is based upon judgment of several subject experts. After the items were constructed, the draft was given to experts in the field of education for analyzing the content, language, nature of the items as well as for editing the statements. Based on their suggestions and useful recommendations, the statements were modified accordingly and some of them were rejected. Scoring was also done to find out how many statements are accepted and how many statements are omitted. Only statements with a score of above 50% were retained while those with a score of below 50% were discarded. After try out, item analysis was carried out where only items with t-value above 2.77 which are significant at 0.01 level were selected. Therefore, the scale has content validity.

- c) **Discriminant Validity**- The discriminant validity coefficients have been found to range from 0.35 to 0.89.

3. Setting of Norms

Norms refers to information regarding the group performance of a particular reference on a particular measure for which a person can be compared to. It indicates the individual's relative standing in the normative sample and thus permit evaluation of his/her performance in refer to other persons. It is also used to standardize tests and create a scoring system or baseline from the average scores of the group. In order to establish the norms, the data collected from 270 samples was used. Raw scores of any distribution are meaningless if they are not converted into some derived scores. Such derived scores are generally called standard scores. The standard scores are percentiles, percentile ranks an T-scores. In this study, the raw scores obtained from the 270 samples are converted into Z-scores. The results can be seen in Table 4.2.

Table 4.2

Standard Scores

Standard Scores	Frequency	Percent
<= -1.00000	57	21.1
-.99999 - .00000	78	28.9
.00001 - 1.00000	78	28.9
1.00001+	57	21.1
Total	270	100.0

4. Development of Manual

A Manual for Scale for Teachers' Attitude towards MOOCs (STAM) is to be developed after the completion of the study which will serve as reference while using the scale. In the present study, the investigator have tried to develop material for the scale but she has not made it ready for the publication. The following points have been included in the manual.

Introduction

Education in the present era demands that there should be change existing traditional educational system, the system that is believe in offline courses like refresher courses, orientation programmes, conferences, seminars etc. for teachers that are working in the

higher education institutions. These all courses are also possible by online mode. Teachers join MOOCS to enhance their content knowledge, communication skills and update their methods of teaching. That's why it is important to assess the teachers' attitude towards MOOCS. In the present study, the investigator prepares a Scale for Teachers' Attitude towards MOOCs (STAM).

A. Description of the Scale

The Scale for Teachers' Attitude towards MOOCs (STAM) has been developed with the aim of finding out the attitude of teachers towards MOOCS. It will enable the teachers to know whether they are still rooted in the traditional role of the teacher or whether they are open to changes that come along with the application of MOOCS in teaching and learning.

B. Scale Construction

Preparation of the test items

In order to measure the Scale for Teachers' Attitude towards MOOCs (STAM), the researcher collected and consulted relevant books, journals, articles, newspaper, etc. in order to collect statements which deal with attitude and MOOCs. A well-constructed attitude scale consists of a number of items that had been carefully edited and selected in accordance with certain criteria. The items making up an attitude scale are called statements. Therefore, out of 110 statements that were constructed, 60 statements were retained while 50 were rejected.

Individual Try Out

Based on the feedback from the experts, some of the 60 statements were modified. There are 38 positive statements and 22 negative statements altogether. The tool was then administered to one teacher educator to determine the level of understanding of the appropriateness of the items of the Scale. Along with the suggestions and feedback received from the teacher educator, item analysis was done for selecting statements for the try out.

Small Group Try Out

For the try out, the attitude scale consisting of 50 statements was then administered to 17 teachers. At this stage, there are 36 positive statements and 14 negative statements.

Final Field Try Out

For the final field try out, the test was administered on 270 teachers of higher education institutions.

C. Administration of the Scale

The examiner has to give proper directions before handing the tool to the respondents. The respondent has to go through each statement carefully before recording the response by putting a tick mark (✓) in the cell against the favoured response. There is no time limit and there is no right or wrong responses. All the responses will be kept strictly confidential and the data collected will be used only for research purposes.

D. Scoring of the Scale

The 50 statements in the final scale and each statement is provided with five alternatives, namely- Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The Scoring for each item of the Attitude Scale was done by giving a score of 5, 4, 3, 2 and 1 for positive statements, and 1, 2, 3, 4 and 5 for negative statements. The highest score for TAMS is 250 (50 x 5 = 250), and the lowest score is 50 (50 x 1 = 50).

E. Reliability

For finding out the reliability of the test, the Split Half Method to estimate the internal consistency of the scale was used on a sample of 270 teachers from various Higher Education Institution in Jammu district. The scale was divided into two equivalent halves by clubbing the odd numbered statements in one group and even numbered statements in the other group. Half test reliability coefficient was computed by Pearson 'Product Moment Method. From the correlation of the half- tests, the reliability coefficient of the whole test may be estimated by using the Spearman-Brown formula.

$$r = \frac{2r^{\frac{1}{2}}}{1 + r^{\frac{1}{2}}}$$

where, r= Reliability coefficient of whole test and $r^{\frac{1}{2}}$ = split half reliability coefficient. In addition, Cronbach Alpha is also being calculated for finding out the internal

consistency of the scale. It is the most common test score reliability coefficient for single administration. Cronbach's alpha coefficient is a test of reliability as internal consistency (Cronbach, 1951).

$$\alpha = K/K-1 \{1-(\sum S_i^2/S_x^2)\}$$

where, α = Coefficient, Cronbach alpha, k = Number of items, S_i^2 = Variance of overall score on the entire test and S_x^2 = Variance of score on each item.

Results

The analysis has been done by using Statistical Package for Social Sciences (SPSS). The results showed that the reliability of the half test is 0.775 and the reliability of the whole test is 0.830. Reliability of the test i.e. Cronbach's Alpha is 0.885. The thumb rule is that if the reliability is 0.7, then the test is considered to be reliable. Therefore, the values of reliability coefficient for this test is 0.83 and 0.89 respectively, thus, the scale has been found to be internally consistent.

F. Validity

Face Validity

The face validity of the scale was confirmed on the basis of the opinion of the experts that it does convey the concept it purports to measure and has a logical link with the objective.

Content Validity

After the items were constructed, the draft was given to experts in the field of education. Based on their suggestions and useful recommendations, the statements were modified accordingly and some of them were rejected. After try out was carried out, only items with t-value above 2.77 which are significant at 0.01 level were selected. Therefore the scale has content validity.

Discriminant Validity

The discriminant validity coefficients have been found to range from 0.35 to 0.89.

G. Establishment of Norms

Norms refers to information regarding the group performance of a particular reference on a particular measure for which a person can be compared to. It indicates the individual's relative standing in the normative sample and thus permit evaluation of his/her performance in refer to other persons. It is also used to standardize tests and create a scoring system or baseline from the average scores of the group. In order to establish the norms, the data collected from 270 samples was used. Raw scores of any distribution are meaningless if they are not converted into some derived scores. Such derived scores are generally called standard scores. The standard scores are percentiles, percentile ranks an T-scores. In this study, the raw scores obtained from the 270 samples are converted into Z-scores. The results can be seen in Table 4.2.

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<= -1.00000	57	21.1
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.00001 - 1.00000	78	28.9
1.00001+	57	21.1
Total	270	100.0

57 (21.1%) teachers have attitude scores less than -1 and equal number of teachers i.e. 78 (28.9%) have attitude scores between -0.9 to +0.9, while remaining 57 (21.1%) have attitude scores above 1.0.

CHAPTER-5

ANALYSIS, FINDINGS, IMPLICATIONS AND SUGGESTIONS

5.1 INTRODUCTION

The main purpose of this study has been the construction and standardization of Teachers' Attitude towards MOOCS Scale and in addition to this, the other objectives were also framed. Analysis of the results has been done to achieve these objectives. This chapter presents the findings, implications and suggestion for further research.

5.2 RESULTS

The collected data were analyzed by using statistical software i.e. Statistical Package for the Social Sciences (SPSS). Findings based on the objectives have been presented objective-wise in the following paragraphs.

Research Objective 1

To construct a scale on "Attitude towards MOOCs" for working teachers in Higher Education Institution.

The Scale for Teachers' Attitude towards MOOCs (STAM) has been constructed and standardized to find out the attitude of teachers' towards MOOCS. The results have been given in the previous Chapter.

Research Objective 2

To standardize STAM scale on teachers working in Higher Education Institution.

- a. Establishing the Reliability*
- b. Establishing the Validity*
- c. Setting up Norm*

The values of internal consistency reliability coefficients for this scale have been found to be 0.83 (Split Half) and 0.89 (Cronbach Alpha) respectively, thus, the scale has been found to be internally consistent. Validity has been also established for the scale and Norms have been given for the scale in the previous Chapter.

Research Objective 3

To develop material for a manual for the STAM

The material for Scale for Teachers' Attitude towards MOOCs (STAM) has been developed and given in the Previous Chapter.

Research Objective 4

To study the level of Teacher's Attitude towards MOOCS

After the tool was constructed and standardized where reliability and validity of the test was established and the norms were derived, the tool was considered to be valid and reliable. The next objective of the study was to determine the level of Teachers' Attitude towards MOOCS as obtained by the Scale. For achieving this objective, the tool was administered to 270 samples of teachers of higher education institutions of Jammu. After obtaining the necessary permission from the head of the institutions, the researcher collected the data. For analyzing and interpreting the researcher referred to the norms that were established as part of the standardization of the tool. Table 5.1 shows the results obtained from the data analysis.

Table 5.1

Level of Attitude of Teacher towards MOOCs

Raw Attitude Score	Level	Frequency	Percent
<= 90	Low	0	0
91 - 180	Average	116	43
181+	High	154	57
Total		270	100.0

Table 5.1 shows the raw scores, levels, N & percentages. It can be seen that raw scores ranging from 50 to 90 have been labelled as Low, raw scores ranging from 91 to 180 have been labelled as Average and raw scores ranging from 180 to 250 have been labelled as High. Table 5.1 depicts that no teacher has been found to be having low attitudes towards MOOCs , 43% teachers have average attitudes and 57% teachers have high attitude towards MOOCs.

Research Objective 5

To find out whether differences exist in teachers' attitude towards MOOCS with respect to their age, and teaching experience.

Another objective of the study has been to find out whether differences exist in teachers' attitude towards MOOCS with respect to their age, and teaching experience. A difference is called significant when the probability is high that it cannot be attributed to chance and hence represents a true difference between the population means. When the difference is not significant it implies that there is no real or true difference between the population means. For testing the significance of difference, null hypothesis is used.

Significant Differences with respect to age.

To find differences in attitude scores of teachers teaching in higher education institutions with respect to their age, ANOVA technique has been employed to find the differences, results are shown in Table 5.2. & Table 5.3.

Table 5.2

Mean & SD for attitude scores obtained by teachers w.r.t. to their age

Age in Years	N	Mean	Std. Deviation	Std. Error
<= 34	107	183.84	8.45	0.82
35 - 40	78	175.74	8.83	1.0
41+	85	186.34	9.28	1.0
Total	270	182.29	9.79	0.6

Table 5.2 shows the age in years, N, mean, standard deviation and error. It can be seen that first group of teachers of age less than 34 years have mean scores 183.84, second group of teachers having age between 35 to 40 years have mean scores 175.74 and third group of teachers having age above 41 years have mean scores 186.34. Table 5.1 depicts that Group 3 (higher age) has highest mean scores and secondly Group 1 has high mean scores and these two groups show favourable scores while second age group has least mean scores among these groups. Total group mean is 182.3 and this show that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean score is more than 150 (50x3) for 50 items. These means were subjected to ANOVA and summary has been given in Table 5.3.

Table 5.3
Summary of ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995.190	2	2497.595	32.05	0.01
Within Groups	20806.277	267	77.926		
Total	25801.467	269			

The value of 'F' (32.05) is significant at 0.01 level. So, there is significant difference in attitude scores among teachers of higher education institutions towards MOOCs with respect to their age. Therefore, Hypothesis 1, stating that 'there is no difference in attitude scores of teachers teaching in higher education institutions with respect to their age' stands rejected. Multiple comparison has also been computed for this and results are given in Table 5.4.

Table 5.4
Multiple Comparisons

(I) Age in Years	(J) Age in Years	Mean Difference (I-J)	Std. Error	Sig.
<= 34	35 - 40	8.098(*)	1.314	.000
41+	<= 34	2.500	1.283	.052
	35 - 40	10.598(*)	1.384	.000

*The mean difference is significant at the .05 level.

Multiple comparison given in Table 5.4. shows that Group 3 (41+) has obtained a higher mean score which is significantly higher than middle age groups and lower age group's mean score is also significantly higher than middle age group (35 to 40 years) but lower than higher age group. So among three groups, middle age group has significantly lower attitude scores.

Significant Differences with respect to teaching experience.

To find differences in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience, teachers were divided in three groups i.e. First group having experience of less than and equal to 9 years, Second group having experience of less than 10 – 14 years and Third group having experience of more than and equal to 15 years. ANOVA was used to find the differences among groups and results are shown in Table 5.5, 5.6, and 5.7.

Table 5.5

Mean & SD for Attitude scores obtained by teachers w.r.t. to their teaching experience.

Teaching Experience in years	N	Mean	Std. Deviation	Std. Error
<= 9	114	184.46	8.86	0.83
10 - 14	103	178.23	8.83	0.97
15+	53	185.51	9.08	1.25
Total	270	182.29	9.79	0.596

Table 5.5 shows the age in years, N, mean, standard deviation and error. It can be seen that first group of teachers having teaching experience of less than and equal to 9 years have mean scores 184.5, second group of teachers having teaching experience of 10-14 years have mean scores 178.2 and third group of teachers having teaching experience of more than and equal to 15 years have mean scores 185.5. Table 5.5 depicts that Group 3 having higher experience has highest mean scores while second group experience of 10-14 years has least mean scores. Total group mean is 182.3 and this show that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean score is more than 150 (50x3) for 50 items. These mean scores were subjected to ANOVA and summary has been given in Table 5.6.

Table 5.6

Summary of ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2779.53	2	1389.77	19.12	0.01
Within Groups	23021.93	267	86.22		
Total	25801.47	269			

The value of 'F' (19.12) is significant at 0.01 level. So, there is significant difference in attitude scores among teachers of higher education institutions with respect to the teaching experience. Therefore, Hypothesis 2, stating that 'there is no difference in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience' stands rejected. In this, the group having teaching experience between 10-14 years has highest mean scores as compared to other two groups. Multiple comparison has also been computed for this and results are given in Table 5.7.

Table 5.7

Multiple Comparisons

(I) Teaching Experience in Years	(J) Teaching Experience in Years	Mean Difference (I-J)	Std. Error	Sig.
<= 9	10 - 14	6.223(*)	1.262	.000
10 - 14	<= 9	1.053	1.544	.496
15+	10 - 14	7.276(*)	1.570	.000

* The mean difference is significant at the .01 level.

Multiple comparison given in Table 5.7 shows that Group 3 (15+) has obtained a higher mean score which is significantly higher than group having 10 to 14 years of experience and group with less than 9 years of experience has a mean score that is also significantly higher than group having 10 to 14 years of experience but lower than higher age group. So among three groups, having 10 to 14 years of experience has significantly lower attitude scores.

5.9 DISCUSSIONS

Results from the present study clearly show that there are significant differences in attitude scores of teachers teaching in higher education institutions towards MOOCs with respect to their age and teaching experience. In the results, it can be seen that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean scores of the all the groups are more than 150 (50x3) for 50 items. It can be due the pedagogy shift and the use technology in curriculum transactions that are happening all around the Globe.

It can also be seen in results that middle age group (35-40 years) and group of teachers having experience between 10-14 years have obtained significantly higher mean scores as compared to other groups. It can be due to that these two groups have either learnt necessary technology skills while teachers in other groups are either in the process of developing a favourable attitude towards MOOCs or are too slow in adapting to the shift. The study shows that, in general, the teachers of higher education institutions have slightly positive and a favourable attitude towards MOOCs. This may be due to some of the following reasons;

1. Teachers are the pillar of education system, they want to adopt new platform of learning like MOOCS as fast as they can as they feel that change is the law of nature.
2. MOOCS are relatively new concept introduced in teaching-learning process and therefore, they are very informative. Online courses enhance the knowledge teachers as well as students.
3. MOOCS requires shifting the offline courses to online courses and everyone has a right to participate in these courses anywhere and anytime.
4. Teachers are aware about the importance of MOOCS in the teaching-learning process and have a positive attitude towards these courses.

5.10 IMPLICATIONS

Education is important for the social and economic development of the country. This is the age of Information dominated by the digital technology. Massive open online courses play an important role in today world of technology.

The results of present study have revealed many important implications regarding attitude of teachers teaching in higher education institutions towards MOOCs.

Teacher Related Implications

- i. The result of study shows that teachers have slightly positive and a favourable attitude towards MOOCs and yet there is a scope of making it more positive and fully favourable by involving them in the whole process of MOOCs i.e. from the development of MOOCs to using these for their academic upgradation. The administration should provide ample opportunities for these type of activities of their professional development.
- ii. The item scores show that teachers are also interested in knowing more about MOOCs so proper platform and environment can be provided to teachers to develop MOOCs especially for lower and higher age groups and fresh teachers and teachers who are not used to use educational technology frequently.
- iii. The study has shown that teachers of higher education institutions have a positive attitude towards MOOCS. MOOCS are essential to enhance the

knowledge of teachers and make them more skillful about the use of modern technology. So there should be a need to provide more awareness regarding MOOCS by organizing workshops, conferences and seminars and teachers show keen interest to join these courses.

Tool Related Implications

- i. This study was done to construct and standardized an attitude scale to assess teachers' towards MOOCS. This scale i.e. STAM has been found to be very reliable and valid in terms of face and content validity. Moreover, norms has been established which serves as frame of reference for interpreting the obtained scores. Therefore, STAM is reliable and valid can be used by the researchers who are interested to assess the teachers' attitude towards MOOCS.
- ii. The prime purpose of the present study was to construct a tool and develop a scale for assessing the attitude of teachers towards MOOCs, so scholar will have a handy information with regard to the attitude scale and scholars, teachers, administrators, heads, and even policy makers may take help the present study in development of a scale and assessing the attitude of teachers and other target groups through the tool developed in the present study.
- iii. Any researcher may take up to validate this study at state, national and international level. The STAM may be used by the students of M.Ed., M.Phil, and Ph.D. to assess the teachers'/students' attitude towards MOOCS. There should be a need to motivate the teacher educators of education institutions to give topics of dissertation related to technology to the students due to this they should assess the attitude of teachers/students in different fields of education.
- iv. Introducing MOOCS in a teaching-learning process is a very beneficial step towards the growth and progress of the teachers as well as students in an education department. Therefore, assessing attitude towards the technology is the demand of an hour in the 21st century.

5.12 SUGGESTION FOR FURTHER STUDIES

The intention of constructing and standardization of The Scale for Teachers' Attitude towards MOOCs (STAM) is that it may be of some use to those who are interested to

assess the attitude of teachers towards MOOCS. However as MOOCS are widely used at all levels of education, the following are a few suggestions for further studies;

- i. Further standardization of the scale to assess student-teachers' attitude towards MOOCS.
- ii. Similar study may be conducted to assess the attitude of teachers at different levels especially college teachers' attitude towards MOOCS.
- iii. The present study is conducted in only Jammu district but the similar study should be conducted on other districts of Jammu & Kashmir.
- iv. Similar study should be conducted to assess school teachers' attitude towards MOOCS.
- v. Publication of manual after another validation.
- vi. Similar study can be conducted on a larger sample to study the use of massive open online courses at B.Ed. and M.Ed. level.
- vii. Further study may also be conducted on students belonging to different areas. Similar study can be conducted on people in different age levels and economic background.

SUMMARY

Topic: DEVELOPMENT OF A SCALE TO ASSESS TEACHERS' ATTITUDE
TOWARDS MOOCS

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INTRODUCTION

Education is vital to the pace of the social, political and economic development of any nation, so vital is the mode through which education is being imparted. Face to face as well as online or distance modes of education are equally contributing towards betterment of our educational growth. Face to face method is well tested and tried method of imparting education for past many centuries and it is still prevailing in whole world. On the other hand, technology is available in abundance these days and it has presented educational field with the latest innovative techniques and tools of teaching and learning which can do wonders if utilized appropriately.

Online mode of education is very famous in 21st century. So MOOCs are a good platform for online education. MOOCs provide a relevant material to the user and it is totally free of cost. A massive open online course is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials, such as filmed lectures, readings, and problems sets, many MOOCs provide interactive courses with user forums to support community interactions among students, professors, and teaching assistants, as well as immediate feedback to quick quizzes and assignments. MOOCs are a recent and widely researched development in distance education, first introduced in 2006 and emerged as a popular mode of learning in 2012

An attitude is an evaluation of an attitude object, ranging from extremely negative to extremely positive. Most contemporary perspectives on attitudes also permit that people can also be conflicted or ambivalent toward an object by simultaneously holding both positive and negative attitudes toward the same object.

The MOOC territory is largely a space for innovation and experimentation, and what is considered a MOOC is still open to interpretation. MOOCs can be defined in many different ways. The literature review provides some of the definitions proposed.

Massive: Massive mean large which include the large number of enrolment in the course at the same time.

Open: access to the course is free, and there are no entry qualifications.

Online: the full course is available through the Internet (using a laptop or desktop computer, a tablet computer or a smart phone).

Course: the submission is a course, sense that it offers an entire learning understanding i.e., it is structured around a set of learning goals in a defined area of study and includes the course materials, assessment tools such as quizzes, feedback, an examination and a certificate of completion.

According to Wikipedia: A massive open online course (MOOC) is an online course aimed at interactive participation on a large scale and open access through the web. MOOCs are a new growth in distance teaching.

Attitudes are fundamental determinants of our perceptions of, and actions toward all aspects of our social environment. Attitudes involve a complex organization of evaluative beliefs, feelings and tendencies toward certain actions.

How much we like or dislike something determines our behaviour towards that thing. We tend to approach, seek out or be associated with things we like; we avoid, shun or reject things we do not like.

In psychology, attitude is a psychological construct, a mental and emotional entity that inheres in, or characterizes a person. They are complex and an acquired state through experiences. It is an individual's predisposed state of mind regarding a value and it is precipitated through a responsive expression towards a person, place, thing, or event which in turn influences the individual's thought and action. Prominent psychologist Gordon Allport described this latent psychological construct as "the most distinctive and indispensable concept in contemporary social psychology." Attitude can be formed from a person's past and present. Key topics in the study of attitudes include

attitude strength, attitude change, consumer behaviour, and attitude e-behaviour relationships.

Jung's definition of attitude is a "readiness of the psyche to act or react in a certain way".

An attitude is an evaluation of an attitude object, ranging from extremely negative to extremely positive. Most contemporary perspectives on attitudes also permit that people can also be conflicted or **ambivalent** toward an object by simultaneously holding both positive and negative attitudes toward the same object. This has led to some discussion of whether individual can hold multiple attitudes toward the same object.

An instrument, usually a questionnaire, designed to measure a person's position on some dimension. Examples: Intelligence scale; conscientiousness scale; self-esteem scale, etc. Can be responded to by oneself or by others – yielding what is called self-report or other-report.

DEVELOPMENT OF AN ATTITUDE SCALE

There are different steps to develop an attitude scale:

Discussion: Informally discuss the issues with the experts, teachers, peers and also consult secondary sources. For example, if an investigator wants to develop a scale on attitude of teachers, discuss the topic with teachers, experts in the field such as degree college teachers, education college teachers and university teachers.

Review: Review related literature to the particular topic of interest. Refer journals, books, articles, dissertations, research papers and net sources. Literature review helps in the process of item generation for the scale.

Writing statements: Based on the discussion and extensive review, collect a set of such statements on the issues. Make the items simple and straight forward so that respondents are able to fill out the scale quickly and easily.

Writing positive and negative statements: Write acceptance or rejection statements, it could imply a different degree of favourable or unfavourable attitude towards the issue in which an investigator intended to assess. Statement or item could be positive or negative. Positive statements should be objective statements which are acceptable by

those having the favourable attitude towards the particular issue and just as unacceptable to those not having it.

Create an item pool: Continue writing an items, both positive and negative, until item pool at least twice the size of instrument intended. For example, if an investigator plans to have 20 items in final scale, then create an item pool of 40 items.

Editing of items: After having collected as many relevant statement as possible, the next step is to go through each item carefully.

Criteria for editing:

Avoid the statement which refer to past rather to present.

Avoid using statements that are factual or capable of being interpreted as factual.

Avoid irrelevant to be endorsed by almost every one or no one.

Avoid irrelevant to the object under consideration.

Avoid more than one thought and double negative statements.

Avoid certain word that may not be understood by the respondents.

Avoid certain such universals words such as all, always, none, never, often etc as these introduce ambiguity.

Avoid such words as only, just, merely, etc.

Avoid biased languages. It is important to avoid using emotional words or phrases in items.

Avoid double barrel questions, where the item actually combines two different questions into one.

Rank/Order: After editing, select the items and give rating to the items. Rank orders the items on clarity and potency. Choose an equal number, five categories are fairly standard. Some scale constructors use seven categories and some prefers four or six response categories with no middle category. All of these seem to work satisfactory.

Scoring: The points given for response depend on whether the statement is positive or negative. The person who strongly agrees with a positive statement gets maximum points. One who strongly disagrees with a positive statement gets the minimum points. For the purpose of scoring, assign the numerical value of 5 to strongly agree, 4 to agree, 3 to undecided, 2 to disagree and 1 to strongly disagree.

Write instructions: Write instructions which clearly explain how to select response on the form. Write in simple and easily understandable language.

Formatting the scale: Randomly order the selected items. Use letters to indicate choices such as SA, A, U, DA, SDA.

Validity: Validity is the extent to which the measure provides an accurate representation of what one is trying to measure. Validity includes both systematic and variable error components. A systematic error, also known as bias, is one that occurs in a consistent manner each time something is measured. A variable error is one that occurs randomly each time something is measured.

Reliability: The term reliability is used to refer to the degree of variable error in a measurement. Reliability is the extent to which a measurement is free of variable errors. This is reflected when repeated measures of the same stable characteristic in the same objects show limited variation.

NEED AND SIGNIFICANCE OF THE STUDY

The use of technology opens new avenues in the field of education. The use of technology in education is driven and supported by evidence that new technologies can change colleges and improve education. Attitude is an organization of beliefs, habits, and motives associated with a particular object. It is generally believed that attitudes of teachers towards MOOCs may play a vital role in their development. MOOCs play an important role in every teacher's life. It is easier and convenient to access and provide information and communicate by a social media. Teachers are connected to each other and can make good use of this platform for the working of their profession. MOOCs help teachers to connected to their colleagues off campus as well as senior experts. One of the important advance is to encourage interaction between teachers. The rapid increase in use of information technologies throughout educational institutions is

changing the way teachers work and establish collaboration. So studying attitude towards MOOCs may give insight to teachers, administrators, students and even government authorities.

STATEMENT OF THE PROBLEM

DEVELOPMENT OF A SCALE TO ASSESS TEACHERS' ATTITUDE TOWARDS MOOCS

OPERATIONAL DEFINITIONS

MOOCs: A **massive open online course** is an online course aimed at unlimited participation and open access via the web. All the course run purely through online mode through any platform will be considered as MOOCs is the present study.

Teachers' attitude: Readiness of the psyche to act or react in a certain way towards MOOCs shall be considered as teacher's attitude in present study.

Scale: An instrument, usually a questionnaire, designed to measure attitudes towards MOOCs will be considered as a scale in the present study.

OBJECTIVES OF THE STUDY

The following are the objectives of the present study:

- i. To construct a scale on "Attitude towards MOOCs" for working teachers in Higher Education Institution.
- ii. To standardize STAM scale on teachers working in Higher Education Institution.
 - a. Establishing the Reliability
 - b. Establishing the Validity
 - c. Setting up Norm
- iii. To develop material for a manual for the STAM
- iv. To study the level of Teacher's Attitude towards MOOCS
- v. To find out whether differences exist in teachers' attitude towards MOOCS with respect to their age and teaching experience.

HYPOTHESES OF THE STUDY

- i. There is no difference in attitude scores of teachers teaching in higher education institutions with respect to their age.
- ii. There is no difference in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience.

RESEARCH DESIGN

Research Design is an outline of how investigation will take place. It includes identifying the methods to be used for gathering information, type of tools to use or construct; how to administer the tool and the means for analyzing the data collected. This detailed outline will enable the researcher to work in a systematic manner. According to Kerlinger (1986), “A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme or program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data”.

For the present study, the Descriptive Research method is followed, as it is concerned with the current status of a phenomenon under study. Descriptive studies are one of the most widely used research method in education. It is one of the means through which opinions, attitudes, suggestions and other data can be obtained. According to John W. Best, “Descriptive research describes and interprets ‘what is’. It is concerned with conditions or relationships that exist; practices that prevail; beliefs, points of view or attitude that are held; processes that are going on; effects that are being felt; or trends that are developing.”

POPULATION

A Population is any group of individuals that has one or more characteristics in common and that are of interest to the researcher. There are various ways to configure a population depending on the characteristics of interest. As the present study aims to assess teachers’ attitude towards MOOCS, the population for the study include all the Colleges of Teacher Education, Degree Colleges and Universities of Jammu district.

SAMPLE OF THE STUDY

As populations tend to be very large, it usually is impossible for a researcher to examine every individual in the population of interest. Therefore, researchers typically select a smaller, more manageable group from the population and limit their studies to the individuals in the selected group. In statistical terms, a set of individuals selected from a population is called a sample. A sample is a small proportion of the population that is selected for observation and analysis.

Methods of Sampling- By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it was drawn. The process of such a selection is called sampling. Sampling methods fall into two categories:

1. Non Probability Sampling
2. Probability Sampling

In non – probability sampling, the units are selected at the discretion of the researcher. On the other hand in probability sampling, the units of the population are not selected at the discretion of the researcher but by means of certain procedures which ensure that every unit of a population has a probability of being selected. This method is also called random sampling. For the present study, simple or unrestricted random sampling is used. As this study requires the researcher to construct and standardize an attitude scale, there are three sets of sample which were selected for the different stages of test construction and standardization.

(a) Individual Try Out: The STAM was administered to a single teacher educator of MIER College of Education. The data collected help in determining the level of understanding the appropriateness of the dimensions and the items of the Scale.

(b) Small Group Try Out: The STAM was administered to a sample of 17 teachers of MIER College of Education. These teachers are randomly selected from the U.G. and P.G. department of the college. At this stage, the data that was collected was used for item analysis to select statements for the final draft of the attitude scale. This was determined by applying the ‘t’ ratio as suggested by Edwards(1957).

(c) Final Field Try-Out of the Scale: The selected items of the test was finally administered to a representative sample of 270 teachers which was randomly from the population of Teachers working in Higher Education Institutions in Jammu district for establishing the parameters of validity, reliability and norms of the STAM. The details of the distribution of the samples are given below in table 3.1.

TOOL USED

In order to assess teachers' attitude towards MOOCS, the researcher has constructed and standardized the Scale for Teachers' Attitude towards MOOCs (STAM). Attitude scales was developed to provide a quick and convenient measure of attitudes that could be used with large groups. Attitude scales also provide us with one means of obtaining an assessment of the degree of affect that individuals may associate with some psychological object (Edwards, 1957).

There are various types of attitude scales that have been developed by psychologists and researchers to measure the attitudes of individuals. However the most widely used techniques are the 'Method of Equal- Appearing Intervals' and 'Method of Summated Ratings'. For this study, the attitude scale was developed by following the Method of Summated Ratings which was introduced by Likert (1932). In Likert Scale a statement is followed by the five responses; "strongly agree, agree, undecided, disagree, and strongly disagree". The response categories may also be three or more than five, but the five point scale is the most widely used. Therefore, the Scale for Teachers' Attitude towards MOOCs (STAM) is a five point attitude scale which has been developed to measure the attitude of teachers working in higher education institution of Jammu district.

CONSTRUCTION AND STANDARDIZATION OF ATTITUDE SCALE

Every research work involves gathering of data which require the use of various tools and technique. Some of the major tools and techniques used for gathering data are Psychological tests, Inquiry forms, Observations, Interview and Sociometric Techniques. Psychological tests are among the most useful tools of educational research. They are used for evaluating or measuring behavior in a standardized way. One can select from the available tools or choose to construct his/her own tool according to the purpose of the study. This study involves assessing the attitudes of

teachers towards MOOCs and for this purpose, the researcher had constructed an attitude scale. Many standard attitude scales have been developed to measure attitudes. However the most widely used techniques are the 'Method of Equal- Appearing Intervals' and 'Method of Summated Ratings'. Many attitude scale are also constructed for specific purposes. For this study, the attitude scale was developed by following the Method of Summated Ratings which was introduced by Likert (1932). For constructing a Scale for Teachers' Attitude towards MOOCs (STAM), the following tasks were taken up.

PLANNING

The first task in the construction of an attitude scale is to formulate a plan. Construction of an attitude scale is a lengthy process which involves several procedures that needs to be followed in a systematic manner. Therefore the first step for any construction of a tool is to formulate a well thought out plan to avoid repetition of any step, survey or finding. Lack of proper planning in this type of research work gives room for unwarranted errors thereby resulting in insignificant results. For construction of an attitude scale, planning involves choosing the type of scale to follow, deciding the number of components as well as the number of items.

PREPARATION OF ITEMS

In order to measure the Scale for Teachers' Attitude towards MOOCs (STAM), the researcher collected and consulted relevant books, journals, articles, newspaper, etc. in order to collect statements which deal with attitude and MOOCs. A well-constructed attitude scale consists of a number of items that had been carefully edited and selected in accordance with certain criteria The items making up an attitude scale are called statements. For editing the initial statements to be used in the construction of attitude scales, the following criteria listed by Edwards (1957) should be kept in mind:-

1. Avoid statements that refer to the past rather than to the present.
2. Avoid statements that are factual or capable of being interpreted as factual.
3. Avoid statements that may be interpreted in more than one way.
4. Avoid statements that are irrelevant to the psychological object under consideration.

5. Avoid statements that are likely to be endorsed by almost everyone or almost no one.
6. Select statements that are believed to cover the entire range of the affective scale of interest.
7. Keep the language of the statements simple, clear and direct.
8. Statements should be short, rarely exceeding 20 words.
9. Each statement should contain only one complete thought.
10. Statements containing universals such as all, always, none and never often introduce ambiguity and should be avoided.
11. Words such as only, just, merely and others of a similar nature should be used with care and moderation while writing statements.
12. Whenever possible, statements should be in the form of simple sentences rather than in the form of compound or complex sentences.
13. Avoid the use of words that may not be understood by those who are to be given the completed scale.
14. Avoid the use of double negatives.

For preparation of tools/items and number of items was decided.

NUMBER OF ITEMS

Altogether 110 statements (84 positive and 26 negative statements) was collected.

INDIVIDUAL TRY OUT

Based on the feedback from the experts, some of the 60 statements were modified. There are 38 positive statements and 22 negative statements altogether. The tool was then administered to one teacher educator to determine the level of understanding of the appropriateness of the items of the Scale. Along with the suggestions and feedback received from the teacher educator, item analysis was done for selecting statements for the try out.

ITEM ANALYSIS I-INDIVIDUAL TRY OUT

There are several methods of item analysis that may be used in evaluating the individual statements. For the present study the method as suggested by A.L Edwards (1957) was used. For the basis of rejecting statements, the frequency distribution of the scores based upon the responses to all the statements was taken. Edwards suggested that 25% or some other percentage of the subjects with the 66 highest total scores and lowest total scores must be taken. However, for the purpose of item analysis of this study the top 27% as well as the bottom 27% of the scores was taken aside. The t-values for significance of differences between the mean attitude scores of the top and bottom 27% group of respondents, that were indicative of their difficulty and discrimination values, were calculated for all the 60 statements. Even though a crude and approximate rule of thumb was to regard 't' value equal or greater than 1.75 as indicating that the average response of the high and low groups to a statement differs significantly (Edwards1957), in this case those items having 't' value above 2.77 i.e. statements which are significant at 0.01 level of confidence were retained for the try out scale and statements having 't' value less than 2.77 were then rejected. The 't' value formula is used for item analysis is as follows

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n(n-1)}}$$

where,

$\bar{X}_H$ = the mean score on a given statement for the high group.

$\bar{X}_L$ = the mean score on the same statement for the low group.

N= the number of subjects in the high and low groups.

X_H = score for a given statement in the high group.

X_L = score for a given statement in the low group.

At this stage, item analysis was done component wise and the statements selected are those whose 't' value is equal or greater than 2.77.

Subsequent to item discrimination, 10 statements were discarded and the scale now comprised of 50 statements.

SMALL GROUP TRY OUT

For the try out, the attitude scale consisting of 50 statements was then administered to 17 teachers. At this stage, there are 36 positive statements and 14 negative statements.

ITEM ANALYSIS II

The 't' value was calculated according to the method as suggested by A.L Edwards (1957). Scoring was done as in the preliminary try out. Again only items with 't' value equal to or greater than 2.77 which are significant at 0.01 level are retained. All the 50 items were selected for the final draft of the scale.

FINAL FORM OF THE TEST

In the final form of the scale there are 50 items, 36 positive statements and 14 negative statements. The STAM is a five point scale which has the responses as Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The score ranges from 1- 5. Therefore the maximum score is 250 and the minimum score is 50.

FINAL FIELD TRY OUT

For the final field try out, the test was administered on 270 teachers of higher education institutions.

STANDARDIZATION OF THE TEST

One of the main objectives of the study is to standardize the scale that was constructed. Any test that is standardized has been carefully analyzed and validity and reliability as well as norms have been established by careful statistical controls. Hence in the present study, after construction of the test is completed, the next step is to standardize the test. For this the following procedures are done

1. Estimation of Reliability
2. Estimation of Validity
3. Estimation of Norms

1. Establishing the Reliability

Reliability refers to the extent to which a measuring device yields consistent results upon testing and retesting. In psychometric terminology, reliability means consistency of performance.

Upon calculating it was found that the reliability of the half test is 0.837 and the reliability of the whole test is 0.913. Reliability of the test by using Cronbach Alpha is 0.907. The thumb rule is that if the reliability is 0.7, then the test is considered reliable. The value of reliability for this test is 0.913 and 0.907 respectively, thus the scale is reliable.

2. Establishing the Validity

One of the important procedures for standardization of a test is to determine whether the test is valid or not. Validity refers to how well a test measures what it is purported to measure. The following types of validity have been used for this study.

- a) **Face Validity** -The face validity of the scale was confirmed on the basis of the opinion of the experts that it does convey the concept it purports to measure and has a logical link with the objectives.
- b) **Content Validity**- Content validity is estimated by evaluating the relevance of the test items in relation to objectives of the study. This form of validity is based upon judgment of several subject experts. After the items were constructed, the draft was given to experts in the field of education for analyzing the content, language, nature of the items as well as for editing the statements. Based on their suggestions and useful recommendations, the statements were modified accordingly and some of them were rejected. Scoring was also done to find out how many statements are accepted and how many statements are omitted. Only statements with a score of above 50% were retained while those with a score of below 50% were discarded as indicated in Table 4.0. After try out, item analysis was carried out where only items with 't' value above 2.77 which are significant at 0.01 level were selected. Therefore, the scale has content validity.
- c) **Discriminant Validity**- The discriminant validity coefficients have been found to range from 0.35 to 0.89.

3. Setting of Norms

Norms refers to information regarding the group performance of a particular reference on a particular measure for which a person can be compared to. It indicates the individual's relative standing in the normative sample and thus permit evaluation of his/her performance in refer to other persons. It is also used to standardize tests and create a scoring system or baseline from the average scores of the group. In order to establish the norms, the data collected from 270 samples was used. Raw scores of any distribution are meaningless if they are not converted into some derived scores. Such derived scores are generally called standard scores. In this study the raw scores obtained from the 270 samples are converted into standard scores.

FINDINGS AND IMPLICATIONS OF THE STUDY

Findings based on the objectives have been presented objective-wise in the following paragraphs.

Research Objective 1

To construct a scale on "Attitude towards MOOCs" for working teachers in Higher Education Institution.

The Scale for Teachers' Attitude towards MOOCs (STAM) has been constructed and standardized to find out the attitude of teachers' towards MOOCS. The results have been given in the previous Chapter.

Research Objective 2

To standardize STAM scale on teachers working in Higher Education Institution.

- a. Establishing the Reliability*
- b. Establishing the Validity*
- c. Setting up Norm*

The values of internal consistency reliability coefficients for this scale have been found to be 0.83 (Split Half) and 0.89 (Cronbach Alpha) respectively, thus, the scale has been found to be internally consistent. Validity has been also established for the scale and Norms have been given for the scale in the previous Chapter.

Research Objective 3

To develop material for a manual for the TAMS

The material for Scale for Teachers' Attitude towards MOOCs (STAM) has been developed and given in the Previous Chapter.

Research Objective 4

To study the level of Teacher's Attitude towards MOOCS

After the tool was constructed and standardized where reliability and validity of the test was established and the norms were derived, the tool was considered to be valid and reliable. The next objective of the study was to determine the level of Teachers' Attitude towards MOOCS as obtained by the Scale. For achieving this objective, the tool was administered to 270 samples of teachers of higher education institutions of Jammu. After obtaining the necessary permission from the head of the institutions, the researcher collected the data. For analyzing and interpreting the researcher referred to the norms that were established as part of the standardization of the tool. Table 1 shows the results obtained from the data analysis.

Table 1

Level of Attitude of Teacher towards MOOCs

Raw Attitude Score	Level	Frequency	Percent
<= 90	Low	0	0
91 - 180	Average	116	43
181+	High	154	57
Total		270	100.0

Table 1 shows the raw scores, levels, N & percentages. It can be seen that raw scores ranging from 50 to 90 have been labelled as Low, raw scores ranging from 91 to 180 have been labelled as Average and raw scores ranging from 180 to 250 have been labelled as High. Table 1 depicts that no teacher has been found to be having low attitudes towards MOOCs , 43% teachers have average attitudes and 57% teachers have high attitude towards MOOCs.

Research Objective 5

To find out whether differences exist in teachers' attitude towards MOOCS with respect to their age, and teaching experience.

Another objective of the study has been to find out whether differences exist in teachers' attitude towards MOOCS with respect to their age, and teaching experience. A difference is called significant when the probability is high that it cannot be attributed to chance and hence represents a true difference between the population means. When the difference is not significant it implies that there is no real or true difference between the population means. For testing the significance of difference, null hypothesis is used.

Significant Differences with respect to age.

To find differences in attitude scores of teachers teaching in higher education institutions with respect to their age, ANOVA technique has been employed to find the differences, results are shown in Table 2 & Table 3.

Table 2

Mean & SD for attitude scores obtained by teachers w.r.t. to their age

Age in Years	N	Mean	Std. Deviation	Std. Error
<= 34	107	183.84	8.45	0.82
35 - 40	78	175.74	8.83	1.0
41+	85	186.34	9.28	1.0
Total	270	182.29	9.79	0.6

Table 2 shows the age in years, N, mean, standard deviation and error. It can be seen that first group of teachers of age less than 34 years have mean scores 183.84, second group of teachers having age between 35 to 40 years have mean scores 175.74 and third group of teachers having age above 41 years have mean scores 186.34. Table 2 depicts that Group 3 (higher age) has highest mean scores and secondly Group 1 has high mean scores and these two groups show favourable scores while second age group has least mean scores among these groups. Total group mean is 182.3 and this show that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean score is more than 150 (50x3) for 50 items. These means were subjected to ANOVA and summary has been given in Table 3.

Table 3
Summary of ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995.190	2	2497.595	32.05	0.01
Within Groups	20806.277	267	77.926		
Total	25801.467	269			

The value of 'F' (32.05) is significant at 0.01 level. So, there is significant difference in attitude scores among teachers of higher education institutions towards MOOCs with respect to their age. Therefore, Hypothesis 1, stating that 'there is no difference in attitude scores of teachers teaching in higher education institutions with respect to their age' stands rejected. Multiple comparison has also been computed for this and results are given in Table 4.

Table 4
Multiple Comparisons

(I) Age in Years	(J) Age in Years	Mean Difference (I-J)	Std. Error	Sig.
<= 34	35 - 40	8.098(*)	1.314	.000
41+	<= 34	2.500	1.283	.052
	35 - 40	10.598(*)	1.384	.000

*The mean difference is significant at the .05 level.

Multiple comparison given in Table 4. shows that Group 3 (41+) has obtained a higher mean score which is significantly higher than middle age groups and lower age group's mean score is also significantly higher than middle age group (35 to 40 years) but lower than higher age group. So among three groups, middle age group has significantly lower attitude scores.

Significant Differences with respect to teaching experience.

To find differences in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience, teachers were divided in three groups i.e. First group having experience of less than and equal to 9 years, Second group having experience of less than 10 – 14 years and Third group having experience of more than and equal to 15 years. ANOVA was used to find the differences among groups and results are shown in Table 5, 6, and 7.

Table 5

Mean & SD for Attitude scores obtained by teachers w.r.t. to their teaching experience.

Teaching Experience in years	N	Mean	Std. Deviation	Std. Error
<= 9	114	184.46	8.86	0.83
10 - 14	103	178.23	8.83	0.97
15+	53	185.51	9.08	1.25
Total	270	182.29	9.79	0.596

Table 5 shows the age in years, N, mean, standard deviation and error. It can be seen that first group of teachers having teaching experience of less than and equal to 9 years have mean scores 184.5, second group of teachers having teaching experience of 10-14 years have mean scores 178.2 and third group of teachers having teaching experience of more than and equal to 15 years have mean scores 185.5. Table 5 depicts that Group 3 having higher experience has highest mean scores while second group experience of 10-14 years has least mean scores. Total group mean is 182.3 and this show that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean score is more than 150 (50x3) for 50 items. These mean scores were subjected to ANOVA and summary has been given in Table 6.

Table 6
Summary of ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2779.53	2	1389.77	19.12	0.01
Within Groups	23021.93	267	86.22		
Total	25801.47	269			

The value of 'F' (19.12) is significant at 0.01 level. So, there is significant difference in attitude scores among teachers of higher education institutions with respect to the teaching experience. Therefore, Hypothesis 2, stating that 'there is no difference in attitude scores of teachers teaching in higher education institutions with respect to their teaching experience' stands rejected. In this, the group having teaching experience between 10-14 years has highest mean scores as compared to other two groups. Multiple comparison has also been computed for this and results are given in Table 7.

Table 7

Multiple Comparisons

(I) Teaching Experience in Years	(J) Teaching Experience in Years	Mean Difference (I-J)	Std. Error	Sig.
<= 9	10 - 14	6.223(*)	1.262	.000
10 - 14	<= 9	1.053	1.544	.496
15+	10 - 14	7.276(*)	1.570	.000

* The mean difference is significant at the .01 level.

Multiple comparison given in Table 7 shows that Group 3 (15+) has obtained a higher mean score which is significantly higher than group having 10 to 14 years of experience and group with less than 9 years of experience has a mean score that is also significantly higher than group having 10 to 14 years of experience but lower than higher age group. So among three groups, having 10 to 14 years of experience has significantly lower attitude scores.

5.9 Discussions

Results from the present study clearly show that there are significant differences in attitude scores of teachers teaching in higher education institutions towards MOOCs with respect to their age and teaching experience. In the results, it can be seen that the attitude of teachers towards MOOCs is positive and can be called favourable as the mean scores of the all the groups are more than 150 (50x3) for 50 items. It can be due the pedagogy shift and the use technology in curriculum transactions that are happening all around the Globe.

It can also be seen in results that middle age group (35-40 years) and group of teachers having experience between 10-14 years have obtained significantly higher mean scores as compared to other groups. It can be due to that these two groups have either learnt necessary technology skills while teachers in other groups are either in the process of developing a favourable attitude towards MOOCs or are too slow in adapting to the shift. The study shows that, in general, the teachers of higher education institutions have slightly positive and a favourable attitude towards MOOCs. This may be due to some of the following reasons;

1. Teachers are the pillar of education system, they want to adopt new platform of learning like MOOCS as fast as they can as they feel that change is the law of nature.
2. MOOCS are relatively new concept introduced in teaching-learning process and therefore, they are very informative. Online courses enhance the knowledge teachers as well as students.
3. MOOCS requires shifting the offline courses to online courses and everyone has a right to participate in these courses anywhere and anytime.
4. Teachers are aware about the importance of MOOCS in the teaching-learning process and have a positive attitude towards these courses.

5.10 Implications

Education is important for the social and economic development of the country. This is the age of Information dominated by the digital technology. Massive open online courses play an important role in today world of technology.

The results of present study have revealed many important implications regarding attitude of teachers teaching in higher education institutions towards MOOCs.

Teacher Related Implications

- i. The result of study shows that teachers have slightly positive and a favourable attitude towards MOOCs and yet there is a scope of making it more positive and fully favourable by involving them in the whole process of MOOCs i.e. from the development of MOOCs to using these for their academic upgradation. The administration should provide ample opportunities for these type of activities of their professional development.
- ii. The item scores show that teachers are also interested in knowing more about MOOCs so proper platform and environment can be provided to teachers to develop MOOCs especially for lower and higher age groups and fresh teachers and teachers who are not used to use educational technology frequently.
- iii. The study has shown that teachers of higher education institutions have a positive attitude towards MOOCS. MOOCS are essential to enhance the

knowledge of teachers and make them more skillful about the use of modern technology. So there should be a need to provide more awareness regarding MOOCS by organizing workshops, conferences and seminars and teachers show keen interest to join these courses.

Tool Related Implications

- i. This study was done to construct and standardized an attitude scale to assess teachers' towards MOOCS. This scale i.e. STAM has been found to be very reliable and valid in terms of face and content validity. Moreover, norms has been established which serves as frame of reference for interpreting the obtained scores. Therefore, STAM is reliable and valid can be used by the researchers who are interested to assess the teachers' attitude towards MOOCS.
- ii. The prime purpose of the present study was to construct a tool and develop a scale for assessing the attitude of teachers towards MOOCs, so scholar will have a handy information with regard to the attitude scale and scholars, teachers, administrators, heads, and even policy makers may take help the present study in development of a scale and assessing the attitude of teachers and other target groups through the tool developed in the present study.
- iii. Any researcher may take up to validate this study at state, national and international level. The STAM may be used by the students of M.Ed., M.Phil, and Ph.D. to assess the teachers'/students' attitude towards MOOCS. There should be a need to motivate the teacher educators of education institutions to give topics of dissertation related to technology to the students due to this they should assess the attitude of teachers/students in different fields of education.
- iv. Introducing MOOCS in a teaching-learning process is a very beneficial step towards the growth and progress of the teachers as well as students in an education department. Therefore, assessing attitude towards the technology is the demand of an hour in the 21st century.

5.12 Suggestion for Further Studies

The intention of constructing and standardization of The Scale for Teachers' Attitude towards MOOCs (STAM) is that it may be of some use to those who are interested to

assess the attitude of teachers towards MOOCS. However as MOOCS are widely used at all levels of education, the following are a few suggestions for further studies;

- i. Further standardization of the scale to assess student-teachers' attitude towards MOOCS.
- ii. Similar study may be conducted to assess the attitude of teachers at different levels especially college teachers' attitude towards MOOCS.
- iii. The present study is conducted in only Jammu district but the similar study should be conducted on other districts of Jammu & Kashmir.
- iv. Similar study should be conducted to assess school teachers' attitude towards MOOCS.
- v. Publication of manual after another validation.
- vi. Similar study can be conducted on a larger sample to study the use of massive open online courses at B.Ed. and M.Ed. level.
- vii. Further study may also be conducted on students belonging to different areas. Similar study can be conducted on people in different age levels and economic background.

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APPENDIX I

Scale for Teachers' Attitude towards MOOCs (STAM)

Name: _____ Age: _____

Department: _____ Institution: _____

Qualifications: _____ Designation: _____

Teaching Experience: _____ (in Years)

ICT Skills: Entry Level/Average Level/ Advance Level (Please tick mark)

Dear Teachers,

The statements about the attitude towards MOOC are given below. Five responses given in front of each statement are **Strongly Agree (SA)**, **Agree (A)**, **Undecided (U)**, **Disagree (D)**, **Strongly Disagree (SD)**. You have to select only one category and you have to give your own response by marking a tick (✓) in the selected cell of the statement. You have to show your honest, true and real opinion instead of ideal responses. You are helping for completing important research work by expressing honest opinion.

CVX

Sr.	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
		5	4	3	2	1
1.	MOOC helps in distance education					
2.	MOOC offers unlimited right to learn					
3.	MOOC is an appropriate channel for teaching					
4.	MOOC promotes autonomous learning					
5.	The course materials are available on internet					
6.	MOOCs are only wastage of money					
7.	MOOC requires computer/ smart phone/ tablet with internet connections					
8.	One can learn at home conveniently, flexibly and at your own pace					
9.	MOOC enhances online interaction between teachers and students					
10.	MOOC is a new innovation in educational sector					

Sr.	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
		5	4	3	2	1
11.	MOOCs are available to the entire world					
12.	All the course material is not free					
13.	MOOC involves a technology that combines online learning with new methods of teaching					
14.	MOOC helps teachers in their teaching					
15.	MOOC makes course delivery easy					
16.	MOOC is needed in the education system today					
17.	MOOC gives everyone an equal educational opportunity					
18.	MOOC does not helps students' in their studies					
19.	MOOC is a new style of learning that is interesting					
20.	MOOC enhances teaching-learning process					
21.	I prefer MOOCs for better learning					
22.	I participate less in MOOCs					
23.	Sometimes MOOCs are frustrating					
24.	MOOCs are more challenging for me					
25.	I am more engaged with instructor in MOOCs					
26.	I learn more efficiently in MOOCs					
27.	Every teacher cannot take benefit from MOOCs					
28.	MOOC will becomes monotonous after few years					
29.	MOOCs are not expensive in nature					
30.	MOOCs are helpful for the professional growth of the teacher					
31.	MOOC opens the field of knowledge for the teachers and students					
32.	MOOC is an innovative practice of teaching and learning globally					
33.	MOOCs are good source of knowledge for teachers					
34.	MOOCs enhanced the scope of e-learning for teachers					
35.	India has also taken initiatives to implement MOOCs at a large scale					
36.	There are many challenges regarding the implementation of MOOCs in India					
37.	MOOCs have no benefits for teachers					
38.	I like to join more courses in MOOCs					
39.	I suggest others to join MOOC courses					
40.	I do not learn much from MOOC courses					
41.	MOOC is a platform for online learning					
42.	MOOCs are better than off line courses					
43.	Teachers get benefit from MOOC courses					
44.	MOOC makes learning complicated					
45.	MOOC does not engage participants to study more					
46.	MOOC creates a joyful learning experience for the teachers					
47.	Teacher's progress can be hampered through MOOC courses					
48.	MOOC helps in retaining knowledge longer					
49.	Doubts are cleared faster in MOOCs					
50.	MOOC does not strengthen teachers' capabilities					

Thank You for Valuable Contribution!