CHAPTER I
INTRODUCTION

INTRODUCTION

The concept of education passed through many ages and stages in the process of evolution and at every stage it had a different meaning according to the then existing condition. Education is defined as the process of receiving knowledge and experiences through purposeful teaching learning method. It also means the development of inbuilt skills, capacity, maturity and attitude which help a human being to maintain their personality and live reputed life.

Indian Education system is one of the largest educational systems in the world. The Indian Universities like Nalanda and Takshshila were some of the oldest and premier universities where the disciples from all over the world used to visit for learning basic principles of life, spirituality, disciplines and medical education. The knowledge was imparted through face to face mode of learning. In ancient India, the Rishis and Maha-Rishis used to follow face to face mode for teaching. In the system like Gurukul, disciples lived together with the teacher and acquired knowledge under face to face teaching-learning mode. It was also supported by hands on experience kind of learning where disciple used to learn many skills together including knowledge of pure science, disciplines and grass-roots knowledge related to day-to-day living. Today, we follow this traditional method of teaching-learning but in the form of classroom teaching with innovations as many changes occurred time to time.
There have been changes brought in and innovations introduced into the Indian education system to meet every changing, increasing, and diversified demands of the nation. Tremendous efforts are put in by the Central and State Governments to gear up the formal and non formal system of education to the changing needs and demands. These changes compelled educators to provide effective learning experiences to their students in the 21st century.

There are two fundamental learning theories that are widely used in education system which are most important and useful to formulate learning model for the students today. These two learning theories of behaviorism and constructivism influenced the educationists since their discoveries. Skinner (1948)\(^1\) and Watson (1920)\(^2\), promoted the learning theory of behaviorism. They studied the effects of changes made in the learning environment. Watson believed that if the human beings are conditioned to respond similar stimuli, their behavior change to acquire what they expect. His view was also the part of Pavlov’s research findings (Thomas, 1997)\(^3\) where he performed his conditioning experiment with ringing of the bell to salivate the dog for food. Skinner, with his famous Skinner box, also did broad research with animals and conditioned the rat to press a lever if it desires to receive food. He found that human beings also react to the same to the environment based on prior experiences. On the basis of learning theory of behaviorism, Skinner constructed a teaching machine which was an attempt to provide rote-and-drill practices in the form of a book and programmed instruction model through multiple-choice test. This tech-

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The learning theory of constructivism is an educational theory developed by Swiss psychologist Jean Piaget and Lev Vygotsky. The theory of constructivism suggested that humans on the basis of prior personal experiences should construct their own knowledge. It will benefit them to construct conceptual images to perform physically. Piaget expected that the teacher should provide learning experiences to the learners to make them capable to create their own knowledge. It was the opinion of Vygotsky (1978)⁴ that the teacher should act as guide and facilitator. The teacher should also encourage learners to inquire, discuss and express their own ideas and motivate them to come towards the conclusions. He expected that the students should build knowledge through interaction with their teachers and colleagues, reading materials and learning activities. In Piaget’s theory, the teacher plays a limited role whereas in Vygotsky’s theory, the teacher plays an important role in teaching through the activities related to active involvement of teachers and students such as discussions, debate, problem solving and collaborative learning. The whole idea behind this theory is that learning happens when people interact in groups. This theory is followed by the teachers today in their day to day face to face mode of teaching-learning process.

These discoveries and efforts of psychologist are resulted in changed scenario of education advancements today. Nowadays, both the theories are followed in education all over the world con-

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sidering the suitability for teaching – learning process. On the basis of these theories, the Face to Face mode and Technology Assisted Learning mode are being used in education system as per need of hour. It is as per the requirement and need of the teacher to practice behaviorism or constructivism theory. However, the objective of teaching and learning will remain the same as to make the student to understand the content. Both the theories are defining two different roles of the teacher. But it is clear that the student and the teacher should understand their responsibility and ensure smooth conduct of teaching learning process. Though there are strengths and weaknesses of both the theories, they will continue to be used today in day to day teaching learning process and positively affect learning. More often teachers are using combination of these two theories to achieve their objectives and meet satisfaction of the students with different abilities.

Modes of Learning:

There are two basic modes of learning:

1. Face to Face Learning
2. Technology Assisted Learning

Other forms of learning are perhaps the combinations of these two modes of learning.

1. Face to Face (F to F) Learning:
According to Kumar (2008)⁵, “Face to Face learning refers to learning that occurs in a traditional classroom setting where a faculty member delivers instruction to a group of learners. This could include lectures, workshops, presentations, tutoring, conference and much more”.

According to Boettcher and Conrad (2010)⁶, Traditional Face to Face education, has no content delivered online and can be described as “course with no online technology used; content is delivered in writing or orally”.

According to Addis (2007)⁷, Face-to-Face Learning Environment is a traditional learning environment in which the majority of instruction occurs when learner and instructor are in the same physical setting.

**Key Characteristics of Face-to-Face session**

Face-to-Face session is a convention between participants and instructor. It is a direct contact session between the tutor and learner. It sustains the relationship among the participants and encourages the sharing of knowledge. The interactive sessions such as classes, seminars, workshops, and conferences are examples of face-to-face events in which all participants physically meet together at same locations at specified timings. The face-to-face sessions involve experts and faculty appointed to guide the participants, provide feedback and suggestions. The resource material such as handwritten notes or documents, posters,

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⁷ Addis A. (2007), “Face-to-face and online learning environments”, Southern Illinois University, Carbondale (p.7)
drawings, objects, can be used to highlight points, to sustain attention of the participants and to help convey a difficult concept during face-to-face session.

The Face to Face sessions are useful for exchange and thoughts, suggestions and ideas between participants. It maintains direct contact with the instructor to understand the concept being taught. It is helpful for sharing of knowledge and experience. Facial expressions, eye-contact, praise, body language and the tone of voice of the instructor are helpful for effective communication. The important points can be explained well and participants will get immediate feedback during the session. It is also helpful to the participants to communicate and share their views with each other.

**Advantages of Face to Face mode:**

During Face To Face mode, it is possible to create appropriate learning environments and used by the instructor. Teaching can be structured in such a way that the learner plays active roles to develop and acquire new knowledge. The classroom can be transformed into any knowledge place for field experiences which will be helpful for real community experiences. It is the instructor who can establish relevant learning environments, follow appropriate pace for teaching. The instructor can develop suitable learning environment for effective learning. The instructor is free to perform various learner-centred activities for purposeful learning.

- Face to face mode of learning holds the potential to develop motivational skills, study habits and generate anxiety among the students.
- In face-to-face learning situations, instructors can switch to healthy environment for learning and as per the need of the
learning situations. They can control the learners’ attention and activities and create alternative arrangements during communication if the situation demands.

- The instructor is free to organise interactive sessions and group activities in the classroom with suitable techniques of learning.
- The variety of teaching styles can be grouped together for effective teaching-learning to achieve desired goal. The body language, the facial expressions of the teacher are very effective in classroom settings.
- Personal attention to the learner's progress is possible in Face to Face mode and guided practice sessions can be organised by the instructor.
- Many students tend to learn in groups. In Face to Face mode, group discussions and exchange of ideas can take place under control conditions by the instructor.
- The instructor can design suitable environment in the classroom settings to suit his/her particular teaching style.

**Disadvantages of Face to Face mode:**

In a traditional Face to Face methodology of learning, a teacher teaches and students inactively listen and try to acquire knowledge. All the learners must follow the teacher and often the effective methodology for teaching is not taken into consideration while teaching. The teacher does not think about that the methodology of teaching which is suitable to teach one topic of syllabus may not be suitable for another topic. Further, the teacher decides the lesson to be learnt, teaches as per his pace and teaching style. The learners face difficulties in learning the contents who do not adjust their learning pace with the teacher.
Steps to conduct Face to Face sessions:

1. Planning: The planning of the Face to Face session is very important. It should be planned well in advance. Planning includes blueprint to define duration of the session, agenda of the session, determination of the objectives and expected outcomes. It also includes arrangements for gathering of the participants, provision of resource material (audio/visual aids, handouts, etc.), methods and activities to conduct the session and provision of hospitality to the participants.

2. Beginning: The session should begin on time as per the schedule. To begin the session with an unpredicted gesture by the instructor may attract attention of the participants. The
instructor can use audio/visual aids, sounds or physical activities to begin the session. The instructor should have the clear idea about his participants and their grasping power. The study of background of the participants is the homework activity for the instructor. The command over the language of the delivery and the topic of the session, presentation skills are some of the qualities that the instructor should possess.

3. Sustaining attention: Sustaining attention of the participants during the session is also one of the significant tasks. The instructor may actively involve participants by incorporating two way communication strategies. For the purpose, the instructor should have good communication skills and motivation techniques. The use of appropriate audio-visuals or sounds, hands-on activity, question-answers, use of reading and writing activity may bring variety in the session and helpful to illustrate points. Involvement of guest speakers to share their experience and feedback has an important role in the Face to Face sessions.

4. Motivation: To maintain the good communication between the instructor and the participants, motivation is required. Facial expressions, praise eye-contact and body language of the instructor and use of names of the participants during the session can make participants feel more comfortable. Encouragement for good answer by the participants or making them actively involved in communication will be helpful and motivate the participants. Active role taken by the participants in the session or support provided by them must be appreciated by the instructor time to time.
5. Review and feedback: After completing the session, review and feedback must be considered. The suggestions provided by the participants should be accepted and incorporated in the next session. The self-evaluation may help the instructors to improve their communication skills for the session.

Computers as the tool of technology:

In the technological era today, this Face to Face (F to F) mode of teaching-learning may be substituted by Technology Assisted Learning (TAL) productively where repetition of the learning contents and drill practice in number of times with proper audio visuals is possible. Computers can perform tasks such as data accumulation and preservation more skillfully than humans. This versatility of the computers should be used to bring innovations in teaching learning process. In education, computers can be useful to deliver knowledge more efficiently and also useful to sustain interest of the participants.

Since the last quarter of century, from space to bottom of the earth, the computers are spread with blazing speed in almost all the fields. The modern communication networks will collapse without their guidance and support. Scientific revolutions and discoveries are completely dependent upon them. Businesses, professionals, corporate fields are making use of them at every minute and now found it painfully difficult to operate without them. Every field would be helpless if their computers do not work temporarily. These machines have literally created revolution. While in almost every field the computers are being used, education field does not
concentrate on versatility and usefulness of the computers in education.

The information technologies have been used gradually in education as a sub institution of society. As a result, new study fields and new disciplines are emerged. Some important developments can be seen in the field of education e.g. some of the academic process such as admission to courses, payment of fees and provision of study material has been started in online mode. The only improvement that the Indian schools & colleges have embraced in the last ten years is the introduction of computers and its features in the curriculum. Online guidance from the nationwide experts is also organized by some of the reputed institutions. But the access is limited to urban areas. The rural India is still unable to get access of education through computers. Zhang et al. (2004)\(^8\) suggested that technology-assisted learning can substitute for some conventional, face-to-face, classroom-based learning.

**Shift from Face to Face to Technology Assisted Learning:**

The gradual use of technology in education has compelled education systems to shift its focus from Face to Face mode to Technology Assisted Learning (TAL). Since the computers have variety of multimedia properties, they are helpful to make abstract concepts easy to understand. They are useful in self learning mode rather than face to face where a single teacher is trying to teach a number of learners together irrespective to their learning styles, pace, capacity and study habits. In Technology Assisted Learning (TAL), the computer plays a crucial role in performing many aca-

ademic functions such as supplementary teaching, witnessing activities and performances of students, evaluation and assessment of knowledge, record keeping and preserving data, giving feedback and supporting instructions with graphics, pictures, animation and sound. It allows the learners to learn at their own pace, leisure and learning styles.

According to National Curriculum Framework (2005)\textsuperscript{9}, “A teacher dominated pedagogy which relegates learners to a passive role, emphasizes memorization and limits interactions between learners, is unlikely to promote effective learning.” According to it, schools and teachers have a pivotal role in helping students to acquire these skills and preparing them for independent learning.

In face to face mode, the teacher performs various activities in the classroom settings such as teaching, guiding, noting and evaluating performances and record keeping etc. The changing nature of learning method compels the teachers to adopt the TAL model as an alternative to traditional face-to-face mode. Now, it is necessary for the teachers to change themselves and accept advance technology in education for teaching learning process and apply in the classrooms in accordance with changes in educational perspectives. Where at every moment, technology is changing, it is essential to make the students aware of these changes and accept these alterations for the better understanding and learning.

2. Technology Assisted Learning (TAL): Technology Assisted Learning is a computer assisted interactive instructional method that uses a computer to present learning material in audio-visual

form, allow the learner to drill and practice, track and assess learning by the learner and direct the use of additional material which meet the learner’s need.

History of TAL: The use of technology in education was started in the 1960s mainly in USA when Patrick Suppes first developed CAI package at Stanford University. Suppes studied the advance features of computers and used them for student related activities such as giving feedback and record keeping. During the 1970s, the use of computers was increased gradually in schools in USA and up to the late 1970’s, TAL reached to the universities. The big mainframe computers were invented and tried to use in schools with its tutorial and drill-and-practice programs. This can be considered as the most developmental phase. Computer Assisted Instruction became widely available to the general public since the early 1990’s. Today, CAI as the tool of TAL can be delivered in offline or online modes of learning.

Computer Assisted Instruction (CAI):

Computer Assisted Instruction (CAI) is the tool being used for Technology Assisted Learning (TAL) to improve student achievement in learning process. It refers to computer programs that provide drill and practice exercises. It is a device of TAL that helps teachers to enable learning process effectively. It is the distance learning mode supported with the computer software. It is defined as an interaction between students, a computer controlled display and a response entry device. Now, CAI is being used in educational institutions for the purpose of achieving educational
outcomes. Thus, the computer technology has altered the education landscape.

The Technology Assisted Learning have also introduced various forms of learning which includes e-learning, online learning, mobile learning, virtual classrooms, web forums etc.

*Virtual classroom:* E-learning is a learning with technology through an information network - the internet, intranet (LAN) or extranet (WAN). The virtual classroom method is very useful for e-learning where the tutor presents information through well equipped internet settings on schedule time and duration and the participants may join the tutor remotely where network facility is available. It is a form of advanced classroom where tutor can teach the contents, respond to the queries put forward by the participants and interact with them in online mode. Virtual classroom has its own limitations but it is helpful for those who are unable to participate in face to face classroom settings. Virtual classroom also provides the facilities for review, comment and class assignments.

*Online learning:* In online mode of learning, the courseware is kept available through the internet in audio visual mode for the learners who learn by their own as per their convenience. Here, the computer works as private teacher as the teacher’s physical present is not required. Computer software keeps the data related to student’s performance, evaluation and provides feedback to the students time to time.

*Mobile learning:* Mobile learning is new terminology where learning takes place with the availability of wireless networks and
portable digital devices including laptop computers and mobile phones. The learning occurs anywhere and anytime where open source of connectivity network is available. Mobile learning provides the opportunity to learn the contents in online mode as per the availability of learning sessions. It has the facility to download the learning sessions and review it as per convenience and pacing of the learner.

Hui et al. (2008)\(^{10}\) compared the effectiveness and satisfaction associated with technology-assisted learning with that of face-to-face learning. It showed that technology-assisted learning improves students’ acquisition of the kind of knowledge which requires abstract conceptualization and reflective observation, but adversely affects students’ ability to obtain knowledge which requires concrete experience.

Johnson et al. (2000)\(^ {11}\) compared learning methods in human resource developments and reported positive effects of technology-assisted learning and showed that students in the technology-assisted group perceive the instructor more positively and rate the overall course quality higher than their counterparts in the face-to-face group.

Piccoli et al. (2001)\(^ {12}\) showed that learning performance is comparable between students using technology-assisted learning and those learning from face-to-face instructions.

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Features of TAL: Humans are multi-sensory animals. The more senses through which we receive information, the easier it is to remember. According to Fletcher (1990)\textsuperscript{13}, people remember 20% of what they hear, 40% of what they see and hear and 75% of what they see, hear and do. TAL can exercise various senses and present information in a variety of media can enhance the learning process. TAL encourages learning as they provide a stimulating environment and promote enthusiasm. TAL can cater for students of different abilities. Also, TAL performs with the pace of the students to make them skilled. TAL provides reliable and consistent instruction to learner, regardless of the teacher, the time of the day or the location. It can improve efficiency and effectiveness. It allows the teacher to develop the contents conveniently. It provides one to one interaction in teaching learning process through reading, writing, listening, and speaking skills. It provides colorful figures, graphics, 3-D text, animation and also sound which make learning process interesting. The following diagram shows various features of TAL:

a. Learner centred: Learner centred means to perform the learning activities keeping the student at the centre of the learning process. TAL focuses the learner, his/her needs and motivations.

b. Learner controlled: Learner control involves learner's ability to understand the content, perform in practice sessions and conduct of review while learning with TAL. Learner controlled programs under TAL allow learners to learn the content of their choice and as per their learning styles.

c. Learner ability oriented: A TAL program can present more information and exercises as per the ability and requirement of learner. Some learners are very quick to grasp the contents and some are very slow. A TAL program can adjust the pace of learning by the learner.

d. Self-paced learning: The learners can learn as per their speed and pace slowly or as quickly. They can skip a topic or learn as
many times or proceed further if they have learnt the topic earlier or have the information before. They can spend more time on topics of their choice. They can learn till they are satisfied.

e. Self-directed learning: The learner can decide their order of learning the contents as per their choice. They can use various learning strategies and learning styles for their understanding.

Limitations of TAL

When information technology became a part of education, the people were very concerned about its effectiveness since students and teachers are not together and students have to learn on their own and have to use self learning mode. Some people thought about the cost and availability of Internet facility and computer with TAL enabled software. With self-access programs, learners who are good in technological aspects can grasp the information quickly and others may only struggle to understand. Some may be very interested to learn with technology; on the other hand, the internet connectivity failure may trouble the learners and can create frustrations among them. Also, teachers may resist because TAL activities need technical skills among the teachers to evaluate than traditional exercises. It is also clear that the learning with technology is only possible where the technological resources are available. In most of the rural areas of our country where frequent power failure occurs, one may not rely on use of technology in day to day teaching learning process.

Factors Affecting the Learning Process under TAL: There are various factors that affect the learning process.
a. Computer-related factors: The software to be used for TAL should be suitable to deliver learning contents well. The choice of software for particular group is the task of the instructor who is using it for better content delivery. TAL applications should include drill and practice sessions. It should provide guidance, immediate feedback and support to sustain the interest of the learner. The software may not be capable of presenting sufficient textual information, visual and audio elements as per the need. The user may be varied in learning styles, literacy levels and interests. Some users may prefer more information on the screen while others may prefer colorful display and more audio-visuals. It should also provide control to the learners to access the contents as per their choice and pace.

b. Learner-related factors: The user group should be capable enough to learn the contents through TAL. Learner factors include prior knowledge, computer related skills to handle the contents, attitude to understand and interest to learn by their own. The delivery of content should be capable to maintain the motivation for successful learning outcome. Such activities can be involved which may helpful to remove stress which was generated among the participants while learning. The failure of connectivity may decrease the interest in self learning. The contents should be delivered so well that suits the learning styles of students.

**Skills required learning through TAL:** To use a TAL program, one must be able to use the computer. Sufficient computer literacy in learners is a necessary condition for self learning under TAL environment. The motivation and anxiety may affect the outcome
of learning. It is necessary to generate and sustain the interest among the learners. The teacher or the computer enabled instruction should have that capacity to attract the learners towards technology assisted learning.

Need of TAL Package for self-learning: By using F to F mode for learning, the students may not get adequate clarification of concepts in the subject of science, geography, maths etc. (Abdul R. and et al.)\(^\text{14}\). So there is a need of TAL package due to following reasons.

- If the nature of the subject is abstract, it can be easily explained through TAL with its audio-visual properties.
- There are minimum 60 students in the class. So the teacher is not able to interact with individual student effectively.
- The TAL package involves audio-visual effect which may sustain the interest among the students.
- The TAL package helps for self-pace and self-control learning of the subject.

Rationale of the study

The researches (Pandya, S.C. & Chaudhary J. 2000, Patel 2012)\(^\text{15}\) in this direction showed that there is a necessity to use innovative methods of teaching by the teacher to keep the students attentive in teaching learning process. The syllabus of B. Ed program is full of variety where separate compulsory subjects namely "Educational Psychology", "Educational Technology" and


"Educational Evaluation" have also been introduced. The subjects like "Educational Psychology" and "Educational Evaluation" have content variety which includes various abstract topics. Technology Assisted Learning Package (TALP) may help the students for learning these abstract topics more effectively. Learning through TAL package will be helpful to the students of B. Ed. program to increase their level of motivation while learning. These students will be satisfied through this innovative method of learning. Colorful graphics will also influence them and make them possible to visualize and to grasp the concepts well rather than passive listening to the teacher at their own pace.

The students will gain greater autonomy to learn and revise the concept as they wished. These students tend to control the pace of the learning. They can learn in their own learning styles and as per their convenience. The students are motivated by such control over their learning. Here, the researcher has prepared a student friendly TAL Package by considering all these factors.

**Need of the study**

The literature review (Nabah, A. et al 2009)\(^\text{16}\) showed that, only using traditional method of teaching, the students are not able to get adequate clarification of concepts in the subject of science, geography, mathematics etc.

There are various reasons that make subject and learning difficult for learners and for the teachers well.

1. The B. Ed syllabus for the subject of ‘Educational Psychology’ consisted of various educational and learning theories such as

Pavlov’s Classical Conditioning Theory, Skinner’s Operant Conditioning Theory, Bandura’s Social Learning Theory, Bruner’s Discovery Learning Theory, Ausubel’s Theory of Meaningful Verbal Learning and Vygotsky’s Socio-Cultural & Socio-Cognitive Theory. It also includes cognitive & constructivist perspectives of learning e.g. Memory, Thinking, Meta-cognition etc. in the subject of ‘Psychology’. These theories and learning perspectives are challenging in nature to teach or learn without proper understanding of concepts and personal experience in some extent for the terms like memory, fatigue etc. The teacher may find it difficult to make the students understand the concepts like conditioning learning or verbal learning, amnesia theories or metacognition. Such concepts can be easily explained with the help of TAL.

2. There are minimum 80 students in the class of B. Ed. on an average. So the teacher is not able to interact with students individually and effectively.

3. If the nature of the subject is abstract, the learners do not understand the concepts well and therefore not able to score maximum marks in the examination. Sometimes, they fail to understand the difference between various concepts and its examples which are abstract in nature. Some abstract concepts cannot be explained through lecture or chalk and talk method.

4. The teacher is also unable to teach each student individually. The B. Ed. class involves diverse students with different learning styles. The students from urban or rural areas are enrolled together for B. Ed. program. The teacher with eighty students on an average has to try to teach considering variety of learning levels and ability. Some students may understand quickly while other
will be demotivated if they did not understand. Sometimes, higher authorities decide how much to be taught in the classroom with fixed span of duration.

At present, B. Ed colleges in Thane District are mostly unaided and hence not receiving any financial support from the Government. So the management of unaided B. Ed colleges tries to appoint less number of teachers as compared to aided colleges. They tend to share full workload of B. Ed. program in only 4 to 5 teachers where actually minimum 8 to 10 teachers are required. So each teacher has to teach an additional subject with additional responsibility of co-curricular activities in most of the un-aided B. Ed. colleges. It increases the workload which is doubled than actual and salary is often not paid as per their expectation or according to pay scales for teachers. It may affect the quality of teaching and teachers may tend to avoid extra hours of teaching. They tend to provide printed notes to the students and ask them to prepare. The lecture method or sometimes presentation with power point is used by them for teaching. This method will not be so effective for explaining abstract concept in most of the subjects. There is a need of using different media like audio, video, and information technology, etc. for providing effective instruction. It is the responsibility of the teacher to achieve teaching objectives by effective teaching. But, presently, a teacher has to do much other academic work along with the teaching learning process. As the teachers are over burdened due to a variety of reasons, all the objectives may not be achieved to the expected level. The subject of 'Educational Psychology' and 'Educational Evaluation' of B.Ed. syllabus deals with different types of content which includes various abstract topics. To make the students understand these
topics well, the teacher has to take the help of educational technology. As the computer combines all the aspects of audio, video, television, tape recorder etc. it can be used as effective tool for teaching.

Therefore, the researcher has attempted to prepare TAL package for the subject of 'Educational Psychology' for the theory based topic of ‘Motivation’ which has abstract theories in intention to make these abstract concepts easier to learn by the students.

The researcher also prepared TAL package for another skill based topic namely 'Unit Test Plan' from the subject of 'Educational Evaluation' of B. Ed. syllabus in University of Mumbai in intention to teach this topic more effectively with the help of technology where the students are trained to acquire the skill of preparing unit test plan.

As the review of related literature (Nabah, A. et al 2009) showed that TALP is effective in enhancing the achievement of students, attempts are made to prepare TALP for the selected chapter in B. Ed. curriculum to make it easy to learn by the B. Ed. students to overcome the above difficulties.

The researcher took help of computer experts having expertise in computer programming to prepare TAL package. The researcher himself also took training from the experts to develop TAL package with various commands and programs to run the software and to make the frames of presenting the learning material with the assistance of a computer.

Technology Assisted Learning Package (TALP) may play the important role in teaching the subject of 'Educational

Psychology' and 'Educational Evaluation' of B.Ed. syllabus as it has following potentials.

- TAL has facilities to present the text along with graphics which helps in understanding of different concepts together.
- TAL can provide the remedial coaching when learners particularly do not have the clarity of basic concepts.
- With the help of linear programming technique in TAL, it can be possible to develop interest in the learners towards content.
- TAL can provide three dimensional effects in colorful graphics which sustain interest and helps to develop curiosity among the students.
- TAL can help the teacher to assess the learning progress, ensure learning outcomes, prepare progress report, provide drill and practice sessions for remedial coaching.

**B.Ed. Program:** There are total 63 Colleges of Education (B. Ed. colleges) in the jurisdiction of University of Mumbai spread over Mumbai, Thane, Raigad, Ratnagiri and Sindhudurg districts. B. Ed Program is one academic year Bachelor of Education degree program conducted by the University of Mumbai for the students who completed their graduation and intend to become a teacher. Every year, the centralize admission process for B. Ed. program is conducted by Government of Maharashtra. The admission forms for Common Entrance Test (CET) are invited to fill up in online mode in the months of May-June from graduate candidates and also candidates appearing for final year of graduation. The candidates who are the graduate and succeeded in CET are eligible to get admission for B. Ed. program. The B. Ed. colleges which are not
participating in government centralize admission process to B. Ed, have formed their own association. These colleges conduct their own CET and admission process separately under intimation to Government of Maharashtra. In the present research, the students who have enrolled for B. Ed. degree program through CET conducted by Government of Maharashtra are only involved.

The B. Ed. program has 5 compulsory subjects of 500 marks (Part A) i.e. 100 marks each divided into 2 parts of 50 marks each making 10 papers to study. In addition, there is internal evaluation of candidates individually for maximum 500 marks (Part B) based on his overall performance during the year such as, his/her simulated teaching skills, practice teaching in schools, participation in all the co-curricular activities organized by college at college and community level, internship etc. The student has to succeed in both the parts as per University criteria, and then only he /she gets the degree of B. Ed. Once the student gets the degree of B. Ed., he/she is entitled to teach the subject at secondary school level in which he/she is graduated. If he/she has a master's degree in his/her subject of graduation, he /she is entitled to teach that subject at Junior college level. Further, if he /she succeeds in NET/SET Examination or acquires Ph. D degree, he/she is entitled to teach his/ her post graduate subject at degree college level.

**Use of TAL in B. Ed program:** Technology Assisted Learning is useful to present audio-visual information in a sequence manner for learning via computer. The study of the related literature (Pandya, S.C. & Chaudhary J. 2000)\(^\text{18}\) revealed that the Technology

Assisted Learning (TAL) is a very important medium self-learning. It is useful to deliver instruction in electronic mode which influences the student learning. TAL model is popular for self-learning.

Considering the significance and potential of TALP for TAL, the researcher has attempted to develop a TAL Package for the selected chapter in Educational Psychology and Educational Evaluation subjects of B. Ed. curriculum with the help of computer software which has the facility to present the instructions with colorful graphics that are needed in learning the abstract topics such as Motivation and Unit Test of B.Ed. syllabus. Though these topics, which are very interesting to learn, teacher may find it difficult to teach these topics to the B. Ed. students where these students are enrolled from different educational background with a different ability of learning.

Therefore, the researcher has attempted to prepare TAL package for the subject of 'Educational Psychology' for the psychological topic of motivation which has abstract concepts in intention to make these abstract concepts easier to learn by the students.

The researcher also prepared TAL package for another skill oriented topic namely 'Unit Test Plan' from the subject of 'Educational Evaluation' of B. Ed. syllabus in University of Mumbai in intention to teach this topic more effectively with the help of technology where the students were trained to acquire the skill of preparing unit test plan.

The testing of learning by students has utmost importance today due to competitive nature in the field of education where the techniques of learning are changing day by day and students are
gaining knowledge with various ways of learning including the use of technology in education and learning. The number of students, achieving maximum percentage of marks in the tests prepared by the teacher is also increasing day by day.

However, to design a test that may test the student's learning is a skill as the teacher needs to consider many factors together such as objectives of testing, weightage to the content, its difficulty level that may suit all the students irrespective to their level of understanding or the type of questions suitable to particular age group etc. The design of the unit test is an important step in setting any unit test paper for effective evaluation. A proper design would increase the validity and reliability of the test. Hence, the researcher here has chosen to teach the topic of Unit Test Plan with the help of technology and prepared the TAL package for the same.

**Contents of TAL Package for TAL**

**Motivation (Knowledge based topic)**

- Introduction
- Definitions of Motivation
- Concept of Motivation
- Examples of Motivation
- Objective test on Motivation
- Motivation Theories
- Maslow's Hierarchy of Needs Theory
- Revision and Examples of Hierarchy of Needs Theory
- Objective Test result
Unit Test (Skill based topic)

- Introduction
- Concept of Unit Test
- Contents of Unit Test
- Purpose of Unit Test
- Unit Plan Design
- The Blue Print of Unit Plan
- Design of Unit Test
- Objective test on Unit Test
- Hands on experience to prepare a draft of Unit Test
- Objective Test result

Procedure of Development of TAL Package by the Researcher for TAL

TAL can be characterized as interactive and individualized learning as it usually involves a dialogue between one student and a computer programme and student can learn at his own pace and time frame (Patel 1990)\(^\text{19}\).

1. By considering the instructional objectives, the researcher has constructed a learning material on the selected chapter of "Educational Psychology" and "Educational Evaluation" subjects of B. Ed. syllabus. The researcher referred many books of said subjects, reviewed the notes prepared by various experienced and reputed teachers on the said topics and selected the contents carefully and arranged it sequentially to prepare a story board for research purpose. The story board is a blue print of the con-

\(^{19}\) Patel T. (1990). Impact of CALL materials in teaching English grammar at higher secondary level, research paper. ELT weekly. 4(17)
tent presenting the planning and sequence of principle points from the contents in verbal and non-verbal form.

2. The definitions of the concepts, the explanations about it, examples were the main parts of the content. The researcher downloaded and developed some useful three dimensional colorful graphics from various web-sites. These three dimensional colorful graphics are used logically and appropriately in the TAL package.

3. This learning material has been made on the principle of programmed learning material in a CD format. When the learner starts the CD with the computer directly, the window of the course module opens giving further instructions. Developed program material has different frames. Each frame contains a part of content of the particular topic. The learner has ‘to click’ the option given in the module and select the frame for learning, and read it, understand it and then proceed further one by one.

4. While the frame is being displayed on the screen, an audio commentary for guidance and motivation is also presented. The student learns by reading the text material presented or by observing the graphic information displayed. It provides audio-visual presentation.

5. After a completion of particular topic an evaluation test has been incorporated with the help of evaluation frame with multiple choice questions such as ‘Choose the correct alternative, Match the pair, Put the items in sequential order’ etc. After delivery of each section of text, questions are generated and student has to give response to it.

6. Feedback on response is indicated immediately. When the learner is giving correct responses and proceeding further, the frame
appears on the screen and motivates him / her by praising his / her efforts. In this way, a learner gets the feedback after each answer. There are total 25 objective type questions also asked in the package.

7. In the evaluation process, when the learner gives correct response to the question asked, he / she is being motivated by the another frame which also advises him / her to proceed further. Similarly, when the learner gives incorrect response to the question, he / she is being advised by the another frame to study the content again.

8. The researcher took care that the learner should not skip any of the content frames. If he / she did so, the frame immediately appears on the screen advising the learner not to do so as the learner will lose his achievement score. The learner is able to study the slide for any number of times till he / she understands it well. After the evaluation process for particular content is over, the learner can see his / her achievement score in the next frame.

In a similar way the entire chapter is presented into different frames. Developed TAL contains the general description of use of this TAL and detailed explanation on the topics of selected chapters including graphics, figures, animation effects, sound and 3-D effects.

In this format, the researcher has tried to develop two different TAL Packages 1. Motivation, 2. Unit Test for the research purpose for 90 minutes of duration each.

**Instructional objectives to prepare TALP:**
The researcher determined the following instructional objectives while preparing TALP after deciding the contents for teaching.

• To make the students aware of the concepts from the contents.
• To make the students aware of the examples from the contents.
• To enable the students to understand the concepts.
• To enable the students to differentiate two diverse concepts.
• To arouse the curiosity among the students to learn the contents by their own with the help of TALP.
• To generate interest among the students for the use of TALP for self-learning.

Mode of presentation: The programmed learning based tutorial mode of presentation is employed in the program similar to the teachers’ classroom instruction on the topic. Programmed Learning technique was first introduced by the behaviorist B. F. Skinner in 1958. It involves self-paced learning frames with information. The learner should read information given in each frame followed by a question to be answered by the student. Further additional frames give more information based on an incorrect answer, or positive feedback for a correct answer. On this ground, the unfamiliar terms and concepts are explained through additional slides containing data to enrich learning. Multiple choice questions are asked and feedback has been provided on the basis of answers given by the learner so that students may keep track of their own learning. The weightage to the

contents and learning skills was decided as per requirement of the study.

**Achievement test:** An Achievement Test has been developed to measure the knowledge, comprehension and application abilities of the students. The objective questions are incorporated in it keeping in mind the objectives. Conscious efforts are made to make the questions to explore knowledge, comprehension and application abilities of the learners. The constant feedback made the programme more effective for learning. Necessary procedure for validity of tools, test development, item analysis was followed. Achievement test was administered to both the groups. Gain scores of learning retention of students for both the groups were used to compare the student learning through TAL mode and traditional Face to Face method of instruction.

**Significance of the study**

TAL packages are currently used in all over the world giving the opportunities to the learners for learning through TAL mode. In India, it is being used in many Universities, Colleges, Private Institutions and International schools also. But the need, impact and utility of these packages are not studied at large.

The review of related literature (Yang and Chen 2007)\(^2\) revealed that very few studies have been conducted in the subject of 'Educational Psychology' and 'Educational Evaluation' at B. Ed. level. Very few researchers concentrated on the academic achievement of college students under face to face learning or

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technology assisted learning. But the impact of TAL package on B. Ed. students was not studied so far. Hence it was necessary to prepare TALP which can be utilized for the research purpose.

Many of the software companies have already developed software packages that can teach and simultaneously evaluate the performance of the student with its audio-visual properties. But they alone cannot satisfy the various needs of the real classroom for B. Ed purpose and hence did not suitable for B. Ed program.

Thus, software that particularly satisfies all the requirement of teaching and present research was needed. The present TALP is an attempt towards in this direction.

In the present study, the TAL Package is prepared in a CD format in which the program may be displayed offline and online and as and when required. At any point, one may stop, go back and go forward according to the demands of the classroom situation. This TALP is capable of teaching, drilling, evaluating, giving assignment and revising the contents. It is beneficial to teachers and students as well. It saves time and energy of the teacher in teaching the contents.

The package will help any other teacher from teacher training college to teach the contents available in it. The software installed in this Package will be reloaded and utilized for other topics too if the teachers in the field are inspired and initiated to develop such packages in the different areas of their teaching.

**Statement of the Problem:** A Comparative Study of the Impact of Face To Face And Technology Assisted Learning on Students of the B. Ed Program.

**Definitions of the Terms**
1. Face to Face (F to F) mode of Learning: The purposeful delivery of contents from the syllabus through lecture method (explanation) by a teacher before the learners in the classroom setting.

2. Technology Assisted Learning (TAL): Technology Assisted Learning is a computer assisted interactive instructional method that uses a computer to present learning material in audio-visual form, allow the learner to drill and practice, track and assess learning by the learner and direct the use to additional material which meet the learner’s need.

3. B. Ed Program: B. Ed Program is one academic year Bachelor of Education degree program conducted by the University of Mumbai for the students who completed their graduation and intend to become a teacher.

4. Learning Retention: Learning retention generally refers to learning matter that can be remembered and reproduced. For the purpose of this study, the marks obtained by the learner at the end of the test administered after both the modes of learning (i.e. F to F and TAL) has been taken to measure learning retention.

5. Impact: Impact may be determined as the difference between Mean of Gain scores of two groups i.e. Group 1- (the group of students learning in face to face (F to F) mode and Group 2 (i.e. the group of students learning with Technology Assisted Learning (TAL) mode (with TAL package).

**Broad objective of the study**

The broad objective of the present research is to compare the impact of two modes of learning namely Face to Face (F to F) learning and Technology Assisted Learning (TAL) on B. Ed.
students in learning theory based topic and skill based topic from the regular B. Ed. syllabus.

**Specific Objectives of the Study:**
1. To develop a Technology Assisted Learning Package (TALP) to learn a theory based topic namely 'Motivation'.
2. To develop a Technology Assisted Learning Package (TALP) to learn a skill based topic namely 'Unit Test Plan'.
3. To explore the relationship between:
   a. social background and learning retention while using F to F or TAL mode
   b. medium of instruction and learning retention while using F to F or TAL mode
   c. geographical locations (urban / rural) and learning retention while using F to F or TAL mode
   d. gender and learning retention while using F to F or TAL mode
4. To determine the extent of learning retention while learning the topic of 'Motivation' through F to F and TAL mode.
5. To determine the extent of learning retention while learning the topic of 'Unit Test Plan' through F to F and TAL mode.
6. To compare whether student's satisfaction is higher or lower with F to F mode or TAL mode.
7. To make suggestions for curriculum planners of B. Ed. program on how to adopt either mode in the most beneficial manner.

**Methodology of the study**

The experimental method of research was used to achieve the specific objectives. The research aimed at comparing the impact of
two modes of learning namely Face to Face (F to F) learning and the Technology Assisted Learning (TAL) on B. Ed. students in learning theory based topic and skill based topic from the regular B. Ed. syllabus. The researcher prepared two similar groups of students on the basis of their CET scores obtained by the students. The student were divided into 5 ranges of score obtained by them in B. Ed. CET from 20-24, 25-29, 30-34, 35-40 and 41 & above. The numbers of students from above ranges were divided equally into both the Groups.

A pre-test for both the groups with the same test paper was conducted. One group was taught the theory based topic namely 'Motivation' with F to F mode whereas another group learnt the same topic by TAL mode. Finally a post-test was conducted for both the groups with same test paper. The marks obtained by the students were considered as test scores. The difference between pre-test and post-test scores were considered as Gain scores which were used for further analysis and conclusion after applying 't' test. Same method was followed for the skill based topic namely 'Unit Test Plan'.

Scope and limitations of the study

Past researches from the review (Pandya, S.C. & Chaudhary J. 2000)²² of related literature suggested that the teaching with TALP has higher positive effect on achievement of students in learning. In these researches, students' achievement scores indicated that the retention of content learned using TALP is superior to retention fol-

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lowing traditional instruction. It is also seen that TALP is an effective way to teach. It is found beneficial in achieving desirable educational goals for students.

This study is significant to students to get alternative method of learning. The study is expected to be further extended to other subjects and other generations and such program be developed for the entire B. Ed. degree course.

The present study is limited to:
1. The Thane district of Maharashtra is geographically classified into three divisions on the basis of local rail routes:
   i) Thane District - Central (from Thane to Neral / Kasara),
   ii) Thane District - Harbour (from Vashi to Kharghar)
   iii) Thane District - Western (from Mira Road to Dahanu)

   This research includes the B. Ed. colleges located in Thane District-Central covering Thane city. It does not include any other district and regions.

   Thane district is selected for research study due to following reasons:
   a. As per Census 2011, average literacy rate of Thane city is 91.36% percent. The male and female literacy rate is 94.19 and 88.14 % respectively.
   b. Thane city is a part of Mumbai Metropolitan Region and very close to Mumbai city. The Mumbai city culturally impacted the Thane city.
   c. Thane city is linked with and surrounded by suburbs through Central and Trans-Harbour Line Suburban railway network. It is a railway junction for the Thane-Vashi Harbour Line and Cen-
tral Line too. So it is well connected with urban and rural parts of the district.

d. The people of Thane largely influenced by Maharashtrian culture and a cosmopolitan culture as well like Mumbai city. The population of Thane city is increased since last five years and experienced huge residential boom. Due to its close location to Mumbai and low rates of land as compared to Mumbai, a large number of immigrants shifted from Mumbai city and other regions of the country.

e. The city is full of multi culture and variety of people. Besides Marathi, the people from all regions of the country with different languages such as Mallyali, Sindhis, Punjabis and Gujaratis from different regions live in Thane. It has language, regions and religious diversity. In other words, Thane district is inhabited with socio-cultural diversity including SC, ST, OBC and Minorities people.

f. A number of B. Ed. colleges located in Thane district are more than any other district of Maharashtra under the jurisdiction of University of Mumbai.

g. The Thane district is selected for sample of the research because, the students taking admissions to B. Ed. colleges located in Thane districts are belonged to this diversity which is one of the requirements of sample for research purpose.

2. The regular B. Ed. class students of all the six unaided B.Ed. colleges open to all category students & affiliated to University of Mumbai in Thane district of Maharashtra who have been admitted through passing the Common Entrance Test (CET) for B.Ed. program conducted by the Government of Maharashtra.
There are total 63 B. Ed. colleges in the jurisdiction of University of Mumbai spread over Mumbai, Thane, Raigad, Ratnagiri and Sindhudurg districts among which the medium of instruction of 30 colleges is English whereas the medium of instruction of 33 colleges is Marathi. Among 25 colleges in Thane district, there are 12 colleges follow English language as medium of instruction and conduct admission to B. Ed. program through Common Entrance Test (CET) of Government of Maharashtra. These 12 colleges are further divided in aided and unaided category as 3 + 9 respectively. From these 9 unaided colleges, only 3 colleges have minority status and 6 colleges follow open status for admission to all. The researcher has chosen these 6 colleges as the sample of study.

3. This study has selected one theory based topic namely, ‘motivation’ from the subject of 'Educational Psychology' and another skill based topic of 'Unit Test Plan' from the subject of 'Educational Evaluation' of the B. Ed. syllabus. The researcher found these topics more complex in nature among all the topics from the syllabus and students are not able to understand them well.

The present research is expected to provide feedback to the B. Ed. colleges so as to whether learning with TAL package has provided them a wholesome way of learning. It is expected to provide feedback to the teachers about the extent of effectiveness of these methods. The study is also expected to show which type of teaching methodology is suitable for teaching particular contents of B. Ed. syllabus. In addition, it will help the curriculum planers of B. Ed. program to plan the curriculum using innovative methods and
techniques so as to develop student’s interest and motivation towards study.

It is well known that the numbers of unaided colleges are increased in the last decade. It is also well understood that teachers in these colleges are facing much workload. In this scenario, this study would help to provide a direction on whether overloaded teachers can improve their inputs for students through the judicious use of technology assisted learning.

Outline of the Thesis

Chapter 1 describes the theoretical background of the various concept included in the research. The meaning and characteristics of the Face to Face mode and Technology Assisted Learning mode are explained in detail. Furthermore this chapter provides empirical evidence concerning the implementation of these two modes and their effects on learning for academic achievement of pupils. It deals with the elaboration of these two modes within this study. It also describes the need, scope, limitations and significance of the research.

Chapter 2 involves the review of related literature with a summary of the main findings of researcher related to comparison between these two modes of learning and its impacts on the students at national & international level.

Chapter 3 deals with the methodology of the research project. It describes the research design, the research sample and the research instruments concerning the achievement of pupils. Furthermore, this chapter specifies the procedures for data collection and the analyses of the data.
Chapter 4 includes data analysis and studies the impact of face to face mode and technology assisted learning mode for comparison as per the specific objectives of the research. Furthermore, it goes into whether these two learning conditions resulted in significant differences between the two groups. It discusses the effects of the two modes on the achievement of the pupils.

Chapter 5 summarizes and discusses the most important results and gives directions for theory, research and practice. It highlights the effects of two modes of learning on the students. It also discusses the implementation strategy of these modes of learning for the benefit of students at B. Ed level. It suggests the researchers how well these modes of learning can be implemented concerning the achievement of pupils and recommends the strategy to develop the educational environment for learning and teaching.