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Phone No.: 0422 - 2692441

Fax: 0422 - 2694572

e-mail: srkvcoejere@gmail.com

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Salem-11, Tamilnadu

Dr. M. VAKKIL
ASSISTANT PROFESSOR,
Department of Education,
Periyar University,
Salem-11, Tamilnadu

CREATING NEW LEARNING AMBIENCES FOR 21ST CENTURY LEARNERS

1

Dr. H.G. Jeyaharish
Senior Principal,
Velammal Vidhyashram,
Chennai.

Dr. R. Krishnakumar
Professor of Education,
Annamalai University,
Chidambaram.

Introduction

Classroom design influences levels of interaction and engagement. Engagement and active learning improve retention. Classroom design can help to develop skills for life and work beyond the classroom. Self-directed learning and collaborative problem solving are essential skills for success. For students, proficiency in 21st century skills—the skills, knowledge and expertise students must master to succeed in college, work and life—should be the outcome of a 21st century education. To be “educated” today requires mastery of core subjects, 21st century themes and 21st century skills. To help students achieve proficiency in 21st century skills, teachers and administrators need education support systems that strengthen their instructional, leadership and management capacity. And both students and educators need learning environments that are conducive to results. How students learn to learn builds essential skills for life beyond the classroom. The League for Innovation in the Community College identified outcomes for twenty-first century learners. These outcomes included communication skills, diversity and pluralism, critical thinking and problem solving, interpersonal skills including

teamwork, relationship management, conflict resolutions, workplace skills, and personal skills for management of change, learning to learn, and personal responsibility. The use of technology within today’s classrooms has been highlighted as a method in which to increase student engagement. In fact, this engagement factor has been included as one of the four dimensions of the Learning Criteria for 21st Century Learners by the International Center for Leadership in Education (Jones, 2009).

DEFINING 21ST CENTURY SKILLS

There is no shortage of current definitions of *21st century skills and knowledge*. In this paper we organize 21st century skills, knowledge, and attitudes, values, and ethics into the following four categories:

- Ways of Thinking: creativity and innovation, critical thinking, problem solving, decision-making, and learning to learn (or metacognition)
- Ways of Working: communication and teamwork
- Tools for Working: general knowledge and information communication technology (ICT) literacy

- Living in the World: citizenship, life and career, and personal and social responsibility, including cultural awareness and competence.

Another definition comes from the book *The Global Achievement Gap* by Tony Wagner (2008), co-director of the Harvard Change Leadership Group. Informed by several hundred interviews with business, nonprofit, and education leaders, Wagner proposes that students need seven survival skills to be prepared for 21st century life, work, and citizenship:

1. Critical thinking and problem solving
2. Collaboration and leadership
3. Agility and adaptability
4. Initiative and entrepreneurialism
5. Effective oral and written communication

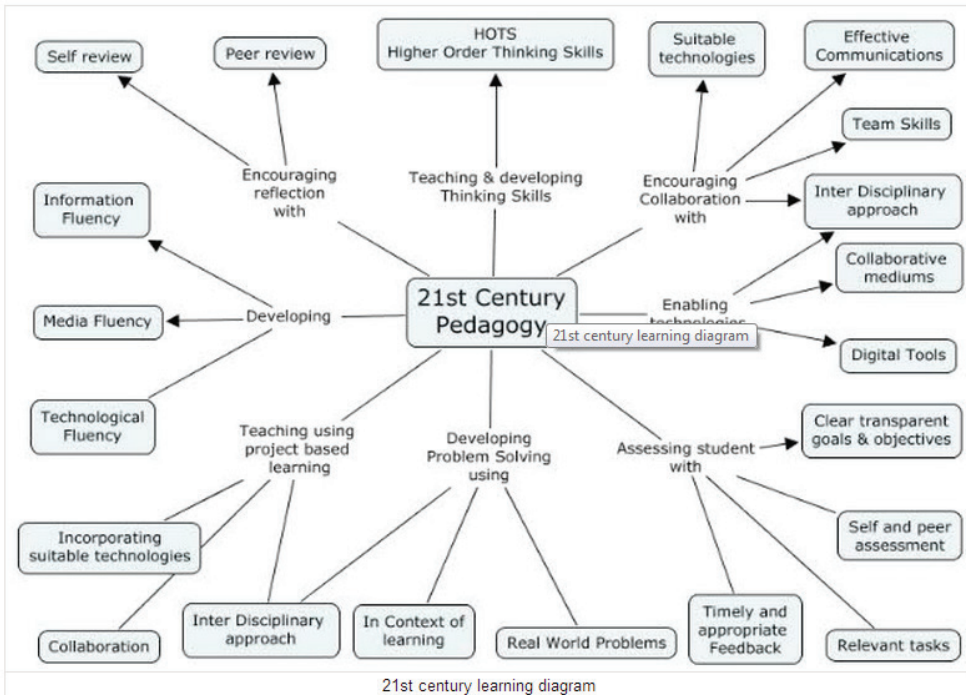
6. Accessing and analyzing information
7. Curiosity and imagination.

In recent years, education systems worldwide have also developed frameworks with an increased emphasis on developing the skills, knowledge, and attitudes necessary for success in the 21st century.

Why Students need 21st Century Skills:

There are compelling economic and civic reasons for education systems to develop students' 21st century skills. The economic rationale is that computers and machines can cost-effectively do the sorts of jobs that people with only routine knowledge and skills can do, which means that the workplace needs fewer people with only basic skill sets and more people with higher-order thinking skills.

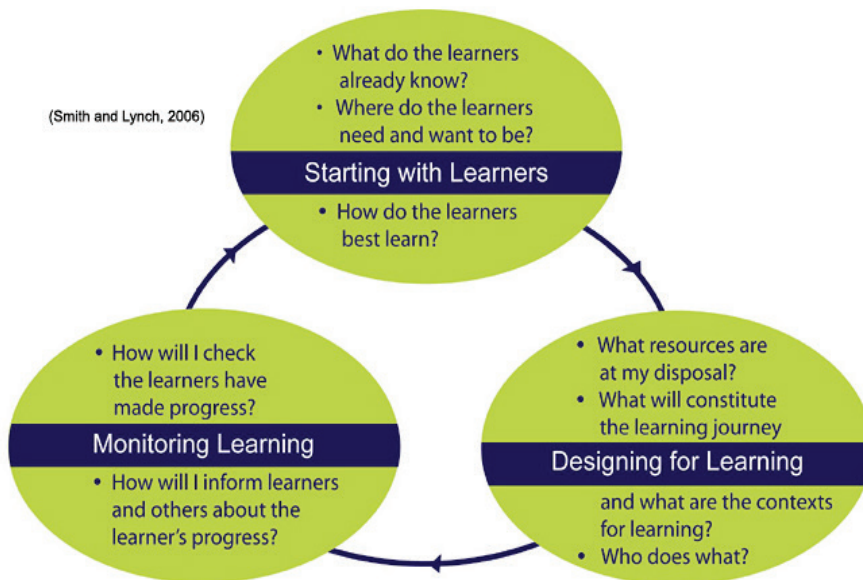
21st Century Pedagogy



Teachers understand the developmental diversity in the students they teach and are responsible for organising learning opportunities to meet individual learning needs. Organising the Curriculum by year level will help teachers do this and will reduce the risk of repetition of content from year to year as students change teachers or schools. Research by Lloyd, Dean, & Cooper (2009) point to conflicting results regarding developmental gains (both cognitive and intellectual) that result from the use of computers within the classroom. Previous research has shown that the teacher has the greatest influence on learning (Harm & Gash, 2013; Harm, Jossis, & Gash, 2013; Stiggins, 2004). This same concept seems to be associated with technology implementation in today's classrooms. Variability associated with how a teacher views technology as an educational tool, how creative and willing she or he is in using 21st Century teaching tools, and the degree of fidelity with which they implement

social -constructivist teaching pedagogy all become part of the larger equation.

A curriculum for the 21st century will reflect an understanding and acknowledgment of the changing nature of young people as learners and the challenges and demands that will continue to shape their learning in the future. Young people will need a wide and adaptive set of skills to meet the changing expectations of society and to contribute to the creation of a more productive, sustainable and just society. Tomorrow's classrooms will need to look, feel, and function differently than those currently operating. The skills that students will need to be successful in tomorrow's classrooms are therefore different than those currently emphasized. 21st Century teaching and learning involves students, while learning topics within their core subjects, making connections to the associated real-world issues, possibly in real-time.



METHOD OF TEACHING 21ST CENTURY SKILLS

The following sections are about how students learn 21st century skills and how pedagogy can address their needs. Many of the lessons—particularly transfer, meta-cognition, teamwork, technology, and creativity—are also 21st century skills in themselves.

1. MAKE IT RELEVANT

To be effective, any curriculum must be relevant to students' lives. Transmission and rote memorization of factual knowledge can make any subject matter seem irrelevant. In response to that model, students memorize information for a test, quickly forget it after the test and then simply look up what they need to know on the Internet when they actually need it.

This model undermines the possibility of developing students' 21st century skills because lack of relevance leads to lack of motivation, which leads to decreased learning.

2. TEACHING THROUGH CROSS CURRICULAR CONNECTIONS

To make curriculum relevant, teachers need to begin with *generative topics*, ones that have an important place in the disciplinary or interdisciplinary study (Cross curricular connections) at hand and resonate with learners and teachers. In this section how a particular topic is interconnected with the other subjects in order to make the learning more meaningful. Cross curricular links are important for learning as learning depends on being able to make connections between prior knowledge and experiences and new

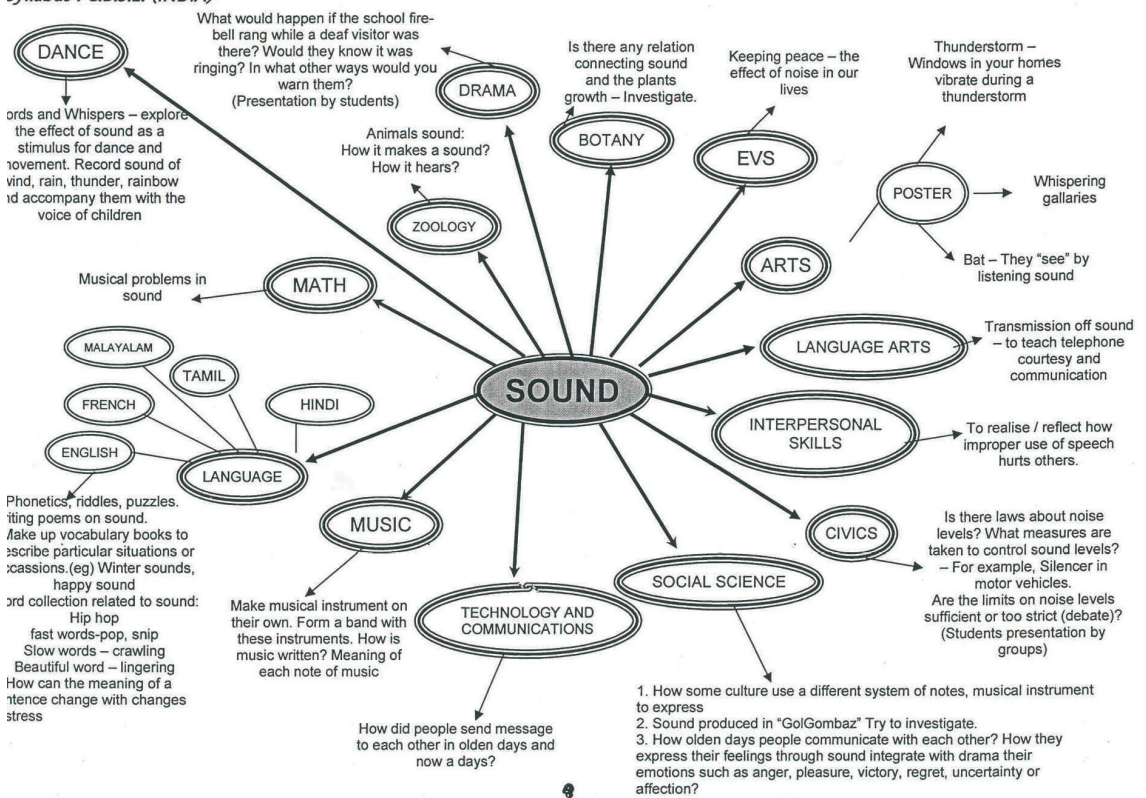
information and experiences. When we give opportunity to the children to measure their progress towards their goals what they establish learning makes more meaningful. This will also motivate them and allow them to face new challenges with lot of confidence. Instead of using the prescribed text book we can use the Cross curricular activities where all subjects are linked also which involves music, drama, art, creative, writing, graphing etc. The cross-curricular approach enables the teacher to provide a vehicle through which children can apply the skills and concepts gained from subject teaching. Furthermore, the children become aware of how to use, develop and extend the many skills they are gaining, they see a purpose and value in having those skills, and the topic usually produces an end result whereas subject teaching tends to be on-going.

To reinforce the understanding that skills and knowledge gained through subject teaching are the "tools" people use to solve problems, make discoveries, communicate with others etc., the children will be made aware of which type of skills they are using when undertaking topic work, i.e., mathematical, scientific, etc. All topic works are carefully planned to ensure that they are complementary to the levels of subject teaching.

Science-of-learning experts concur that learning should take place through the disciplines, including—but not limited to—native and foreign languages, hard and social sciences, mathematics, the arts, and music. Learning through disciplines entails learning not only the knowledge of

Example model designed by the authors:
 Lesson : SOUND
 Grade : VIII
 Syllabus : C.B.S.E. (INDIA)

CROSS-CURRICULAR CONNECTIONS



the discipline but also the skills associated with the production of knowledge within the discipline. Through disciplinary curriculum and instruction students should learn why the discipline is important, how experts create new knowledge, and how they communicate about it. Each of these steps maps closely to the development of 21st century skills and knowledge. For example, through scientific study, students should learn why science is relevant and what kinds of problems they can solve through scientific methods, as well as how scientists carry out experiments, how they reach conclusions, what they do with the knowledge they gain from the process, and how they communicate their findings.

Continued learning in any discipline requires that the student—or expert—become deeply familiar with a knowledge base, know how to use that knowledge base, articulate a problem, creatively address the problem, and communicate findings in sophisticated ways.³⁵ Therefore, mastering a discipline means using many 21st century skills.

3. DEVELOPING HIGHER ORDER THINKING SKILLS (HOTS)

HOTS deals with how to transfer the knowledge what we gained in a particular topic. Lower order is easy and it is to understand the variables are it is quite common in our curriculum.

Transfer tends to be very difficult for most people. However, applying new understandings to a new, uncharted context is also exactly what students need to do to successfully negotiate the demands of the 21st century. Higher-level thinking skills take time to develop, and teaching them generally requires a trade-off of breadth for depth.

Another approach that is popular in some of the schools is to reverse the way students spend their time in the classroom and on homework at home. Instead of listening to lectures at school and doing problems at home, students can read content as homework and, at school, work on problems in groups while the teacher poses thought-provoking questions and coaches explicitly on development of higher-order thinking.

4. EXCHANGE OF LEARNING

Students must apply the skills and knowledge they gain in one discipline to another. They must also apply what they learn in school to other areas of their lives. They must apply the knowledge in their real life situation. For this the teachers should create learning situations in the class room in which the students need to apply the knowledge and skills. Also the teachers should talk through solving a particular mathematics problem so that students understand the thinking process they might apply to a similar problem. Transfer is hard, and students need support from teachers and practice at school to ensure that it happens. Fortunately, we know enough about how to develop students' ability to transfer, and we have a common sense understanding of its power.

5. INDEPENDENT LEARNERS

There is a limit to the skills, attitudes, and dispositions that students can learn through their formal schooling. Therefore, educating them for the 21st century requires teaching them how to learn on their own. Teachers can develop students' metacognitive capacity by encouraging them to explicitly examine how they think. In addition to developing meta-cognitive skills, it is also important for students to develop positive mental models about how we learn the limits of our learning, and indications of failure.

Although some cultures view intelligence and learning capacity as innate rather than effort-based, others believe that effort overrides innate limitations.⁵⁵ Students benefit from believing that intelligence and capacity increase with effort (known as the incremental model of intelligence) and that mistakes and failures are opportunities for self-inquiry and growth rather than indictments of worth or ability.

6. TEAM WORK IS AN OUTCOME AND PROMOTES MEANINGFUL LEARNING

The ability to collaborate with others is an important 21st century skill. In typical transmission-model classrooms, students do not learn from and with their peers. The teacher and textbook transmit information, and the student engages in a one-to-one interchange with the teacher. Through this type of interaction, students lose the opportunity to learn from each other and to develop the skill of working with others. Further, as we have discussed throughout

the paper, working in pairs or groups is an ideal way for students to develop their metacognition and communication skills, to replace their misunderstandings with understandings and to practice low- and high-road transfer. The transmission model, therefore, not only robs students of the opportunity to develop the skills of listening to and learning from others and sharing their thoughts, opinions, and knowledge constructively; it also detracts from opportunities to develop other 21st century skills.

7. ROLE OF TECHNOLOGY IN BETTER LEARNING

Technology is by far the most popular topic concerning 21st Century Learning and education and many of the videos on YouTube are about just that. Although some of these videos cover other ideas, technology still seems to be the central focus.

So the purpose of this article is two-fold: One is to address some of the misconceptions out there about technology and also is about how to implement technology effectively and use in practical pragmatic way.

Technology is not the solution to 21st century education, technology is simply a tool to aid education and learning, also technology should not be told as a separate schools subject, but as a tool, technology should be used in all classrooms. Any learning concerning technology should be based around the theme and objectives of the class. The place of technology in pedagogy is based on various factors and questions of effectiveness, time saving, increased outcomes etc.

Another issue up with technology at the moment is the poor investment in such technology without the support and consultation of technical staff. Schools are spending money on technology but they don't know what it's for how to use it. And because they spent so much money on the technology they lack in spending more on training teachers properly on how to use it. So the end result of this is that things such as interactive whiteboards end up being glorified TV sets in the classroom or simply used as regular whiteboards.

When schools cut corners in terms of spending on technology the result of this is that the things that they do buy are already outdated before they have bought them. For technology to be relevant, constant investment has to be made in that technology, its replacement and updating. I think that any investment in technology has to be made very consciously of the reasons why and how it's going to be implemented within the school; otherwise its money down the drain. Here is where role of technological professionals comes into play.

I would like to give an example of this, firstly one of the key aspects of 21st Century is to promote **student-centered learning**, however if all you invest is in the interactive whiteboards all this leads to is the exact opposite it comes back to teacher-centered learning because that interactive whiteboard becomes the teacher's gadget and because of that it leads to more and more teacher talking time.

Although I do believe interactive whiteboards extremely useful within



classrooms and within education I also think that an equal amount of investment needs to go into the other technologies for students because even though you have these touch screens that you can have multiple people using the boards at the same time you can't have a class of thirty kids all interacting with the board directly. They need to have some alternative technology to interact together.

Beyond its pedagogical potential, there are many other ways in which technology can affect education. Teachers can use it to develop and share best practices. Teachers can create Learning e-Portfolios to develop their pedagogical, content, and experience-based understanding. Technology also provides greater opportunities to use student data for formative and summative purposes and to assess students' understanding in ways that harness MUVE environments and artificial intelligence.

Quite often technology is too expensive for any school to buy, and the functionality of the technology could very limit too. And

my second example of this is also my second reason why I have an issue with technology as it is used at the moment. While many teachers think 21st century education consists of using interactive games and quizzes, so it's like taking the paper-based test and then making it digital. But all this gives teachers and students immediate feedback on student performance it just maintains the status quo on fact-based learning and completely ignores these higher-level thinking skills.

Anyway enough of the negatives, let's move on now and think about practical and not gimmicky ways of using technology in education. As I mentioned before technology is a tool, a way for fact-based learning and allows students to do a lot of the research using the internet and various tools. And at the same time these students are learning very valuable research skills which they can transplant at high levels of education, at universities and beyond. Technology can be used to enhance critical thinking and critical literacy skills,

evaluating the legitimacy and accuracy of online content is the central part of 21st century education.

It's important for young people to understand the morals and ethics of using this online content as you would have seen in the news there are many instances of bullying online and I believe the key reason for this is the anonymity of the internet. So therefore I think that schools should teach about responsibility and accountability in the use of technology in classroom and beyond.

So another important point is the use of technology for collaboration among students and teachers. I believe that technology and social media in education allows people to share ideas. Digital media can be kind of medium at the push of a button which can give students a voice when they wouldn't otherwise have been heard, and at the same time as I mentioned before about critical thinking I feel that students also need to be told about how to deal with criticism, how to give criticism and how to deal with a host of other issues concerning self-esteem with online content.

I think one of the most exciting aspects of technology in education is its use for designing creativity. We can create so many different types of content written, audio, video 2D and 3D, they can create music, they can create videos they can create photos, they can create magazines, conduct experiments and then after creating this content they can use the technology to present their ideas whether it be online or in person.

So in other words technology can be present at every stage of education process from the introduction and the research to the project making to the presentation. One of the things I want from technology is from students to be able to create very sophisticated work and by this I mean things like car design architecture, computer databases, software, games, 2-D and 3-D online animation and so on.

One last thing to consider is that technology is not just about interactive whiteboard or computers other examples include digital cameras, digital microscopes, 3-D printers as well as things like microphones and projectors as well. It's about finding ways to use technology meaningfully, so the investment is made by schools is a worthwhile one, and it makes education more relevant to life and by making the learning more dynamic.

CONCLUSION

In this paper we have explained the importance of 21st century skills and how best to teach and access these skills for the students. If we believe that the 21st century skills are the key to solve economic, civic and global challenges and to engage effectively in those spheres then we must act on the belief that using those skills to overhaul our education system is possible. The 21st century challenge for each of us is to build and maintain our own identity from our given traditions and from the wide variety of traditions all around us. At the same time we must all learn to apply tolerance and compassion for the different identities and values of others. With the growing diversity of global traditions and

values that now surrounds us, the challenge to maintaining social harmony is great, but the opportunities for richer, more creative, and vibrant communities are even greater.

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A STUDY OF PEDAGOGICAL COMPETENCY OF PROSPECTIVE MATHEMATICS TEACHERS IN RELATION TO THEIR ATTITUDE TOWARDS TEACHING OF MATHEMATICS

2

V.CHARANKMAR
Ph.D Scholar
Acharya nagarjuna university
Guntur,
Andhrapradeh

INTRODUCTION

There are six pillars in school education to draw out the best from the child in order to make him a socially conscious useful and productive citizen. The six pillars are, learning of three languages science and Math's, work experience, physical education Mathematics and art

Mathematics, which one of the important one, studies of environment in which the child is born . The development of the personality takes place only in society. It is essential for the children to be aware of the cultural heritage, which has been handed down to them. According to Mathematics finds very important place in curriculum of 1 to 10th classes. It is compulsory subject, in fact this subjects to completely inner disciplinary in nature. It is a subject to completely inner disciplinary in nature. It is a combination of various subjects which seeks to give integrated and sequentially arranged knowledge in the area of the mental horizon of the child has to be widened from the home, school and local community to that of the universal of which he is going to be a part as he grows up.

Any society takes care of its young through the home and school. It is through its schools, that a society prepares its future citizens. In a developing society like ours this responsibility the school is greater, because the school should not only transmit, from one generation to next, our tradition and culture, but help in the process of modernization. For discarding this responsibility, the school depends, among other things, heavily on the teaching of Mathematics, the central concern of which is to understand the relationship between man and his history.

A study of Mathematics helps us to develop a broad, rational, national and secular outlook. The Secondary Education Commission (1952-53) has observed, "The education system must make its contribution to the development of habits, attitudes and qualities of character, which will enable its citizens to bear worthily the responsibilities of democratic citizenships and to counteract all those fissiparous tendencies which hinder the emergence of a broad national and secular outlook.

In the olden days the child learnt about interpersonal relationship of his group at

his home where he was provided with rich activities to know about the relationship that existed between him and his environments. All these experiences were enough to provide him with the social education that he required with advances in science and technology we find more of individual life and the joint family system has almost.

The success or failure of a mathematics course rests mainly with the teacher. He may be provided with all the possible facilities in terms of laboratory, apparatus and equipment, given an ideal syllabus and a sufficient time for teaching mathematics, but unless he is enthusiastic about his work know the subject and really knows how to teach mathematics, he is not likely to achieve success. On the other hand a keen and well-informed teacher who loves his subject and believes in its value will succeed inspite of difficulties and handicaps

In this regard the Kothari Commission Report (1966) says. "Of all the different factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant."

Pedagogy is an academic discipline concerned with the theory and practice of holistic education and care. The term 'pedagogy' originates from the Greek *pais* (child) and *agein* (to bring up, or lead), with the prefix. Pedagogical competence refers to educational and teaching qualifications. When assessing pedagogical competence, the quality of teaching should be the primary consideration. Scope, breadth and depth are also important, as should the

ability to plan, initiate, lead and develop education and teaching, as well as the ability to provide research-based teaching on the basis of research in the relevant subject, subject didactics and teaching and learning in higher education. The ability to interact on issues related to teaching and learning in higher education with individuals active both within and outside the university is also included in the concept of pedagogical competence.

1. Pedagogical competence is based on sound, broad and current knowledge within the subject area, as well as knowledge of student learning and subject-based teaching and learning issues. It also presupposes a reflective and critical approach to teaching, learning and pedagogical development over time, as it is tied to one's own professional role.
2. Pedagogical competence is demonstrated by successful teaching and development of teaching as well as by evaluations and student learning. Both general and subject-specific knowledge of how students learn is a prerequisite as well as for continued development of pedagogical competence to be possible.

The following assessment areas are used to assess pedagogical competence:

- Teaching skills
- Theoretical knowledge
- Approach characterised by willingness and the ability to develop

The concept of pedagogical competence also tends to be used with the meaning of minimum professional standard, often

specified by law, which should raise a person in fulfilling a particular role of the teaching profession (Gliga, 2002). The emphasis in understanding pedagogical competence should thus fall on the integrated features which outline the ability to solve pedagogical problems and typical pedagogical tasks occurring in situations of real pedagogical activities by applying knowledge, professional and life experience, values and talents in a creative manner so to obtain appropriate and effective results.

NEED FOR THE STUDY

Undoubtedly, the quality of School education is the direct sequence and outcome of the quality of teachers and the teacher education system. Hence the importance of quality of teachers in improving the quality of education is a matter of concern and hence quality improvement of our teacher education programme is one of the indispensable needs.

Every year in the city of Visakhapatnam alone nearly 760 candidates join B.Ed. course. These candidates will be selected on the basis of their performance in the common entrance examination. In order to develop the necessary teaching competencies during this pre-service training period, positive attitude towards teaching among B.Ed. trainees plays an important role. Reports of several studies indicate that attitudes can be altered through a combination of constructivist practices such as course work directly related to field experiences and discourse on practical experiences, reading and class discussion (Beyer, 1991, Boyd, Bell, Brawner and Villaume, 1998).

Many studies reveal that there is a significant relationship between the attitude and skills of the teachers. In order to develop favourable attitude towards teaching during pre-service training they should be given some practices. It is not enough if the Prospective teachers are empowered with knowledge and skills but they should have a favourable attitude towards teaching which in turn influences their teaching competency. Hence the present study attempts to assess the attitude of the B.Ed. trainees towards teaching and their teaching competencies.

STATEMENT OF THE PROBLEM

A study of the Pedagogical Competency of Prospective Mathematics teachers in relation to their Attitude towards teaching of Mathematics in Visakhapatnam Municipal Corporation.

Objectives of the Study

The following are the objectives of the present study:

1. To study the relationship between Pedagogical Competency and Attitude towards teaching of Mathematics
2. To study the difference if any in the following variables of the Pedagogical Competency and attitude towards teaching of Mathematics Prospective Teachers
 - a) Sex
 - b) Academic qualifications (Graduate and Post graduate)
 - c) B.A (maths)
 - d) Mode of admission (Ed.Cet and Management quota)
 - e) social status

Hypotheses of the Study

Basing on the objectives stated above the following hypotheses have been formulated:

1. There will be significant relationship between Pedagogical Competency and attitude towards teaching of Mathematics Prospective Teachers
2. There will be a significant difference in the following variables of the Pedagogical Competency and Attitude towards teaching of Mathematics Prospective Teachers.
 - a) Sex
 - b) Academic qualifications (Graduate and Post graduate)
 - c) B.A (maths)
 - d) Mode of admission (Ed.Cet and Management quota)
 - e) social status

Operational Definitions

Pedagogy: Pedagogy is a study of teaching practices, in order to study of teaching it is essential to know the nature of teaching to know about what 'teaching is not about' and to understand its implications for education. Education being a tripolar process, the teacher or educator, the pupil or educand and the subject or curriculum constitutes its three focal points. It is the interaction between these three, which leads to learning. But before this learning can occur, It is the teacher who must initiate this process of interaction

Pedagogical Competency: Pedagogical competence as "the ability of an individual to use a coordinated, synergistic combination

of tangible resources (e.g. instruction materials such as books, articles, and cases and technology such as software and hardware) and intangible resources (e.g. knowledge, skills, experience) to achieve efficiency and/ or effectiveness in pedagogy" (Madhavaram, Laverie, 2010, p. 5

Mathematics: Michaelis says, "The Mathematics are concerned with man and his interaction with his Social and physical environment , they deal with human relationship the central function of the Mathematics is identical- with the central purpose of education the development of democratic citizenship"

Teaching: Soltis (1978) calls a "generic type analysis "where in the task is to tease out the root meaning of the term "Teaching". Teaching is, the person in possession of the knowledge or skill intends to convey it to the other person.

Prospective Teachers: The term prospective teacher in this study refers to a person, who is under the training of B.Ed.

Attitude: In the words of Thrust one's attitude as "sum total of man's imagination an feeling prejudices or bias, preconceived notions, ideas, threats and convictions about a special topic. It is admittedly subjective and personal affair. It is the effect for or against a psychological object.

Teacher Attitude: In the present study teacher attitude denotes attitude of teacher towards teaching of mathematics. Teacher attitude in this study is, directed towards teaching profession, class room teaching, and educational process of perspective teachers.

Research Methodology

The present piece of research falls under the normative survey type of research.

Population and Sample

The sample comprised of 226 Mathematics prospective Mathematics Teachers studied in Visakhapatnam Municipal Corporation, and drawn from 7 B.Ed colleges

Tools

The researcher used the following two tools in this study for collection of data

1. **Attitude towards teaching of Mathematics Scale:** This attitude scale was originally developed by Jaggapa Dora (2003) for research work. The attitude scale is of Likert type it consists of 30 statements. Out of which 20 statements are positive items and the remaining 10 are negative (unfavorable) items.

Scoring

It is a five-point scale, namely strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D), and Strongly Disagree (SD). The respondent puts tick mark either on SA or A or UD or D or SD basing on the agreement with the statement. The scoring procedure for a positive item is 5, 4, 3, 2, and 1 for SA, A, UD, D and SD respectively For negative statement the scoring procedure is reversed i.e., 1, 2, 3, 4 and 5 for SA, A, UD, D and S.D respectively.

2. **Description of the Pedagogical Competency Test:** The investigator wanted to construct this test basing

on the following five units taken from the existing syllabus of “Methods of Teaching Mathematics” from the syllabus in in the Stated of A. P.

- i) Aims and values of Teaching Mathematics
- ii) Instructional Objectives of Teaching Social Studies
- iii) Methods and Approaches of Teaching Social Studies
- iv) Planning for Effective Instruction of Teaching Mathematics and
- v) Evaluation

The investigator choose multiple-choice type of test items for this tool .The investigator prepared 30 such items coming all the above 5 units. Six questions are prepared from each unit, keeping in view the importance and weightage to the different concepts involved in each unit. Before selecting the concepts from each unit, the investigator has consulted the senior most teacher educators in the field for over a period of 3 decades. Basing on their suggestions, the concepts are selected. The tool thus prepared is ready for ‘try - out’. The try-out is done on 70 prospective mathematics teachers undergoing training in 2 Colleges of Education situated in the district of Visakhapatnam. All necessary precautions are taken before administering the tool to them. Only two are allowed to sit on one bench.

The respondents are requested to write answers the tool and collected from the respondents at the end of the test. Script analysis is done for 20 members from the

upper group and the same to 20 from lower group. Though only 27% from the upper group and the same from the lower group are to be selected basing on the suggestion given by Harper & Harper (1990) P.No.357, 20 each group are selected

Item analysis is done for each of the 30 items. Difficulty index and discriminating power of each item of the tool are computed, applying appropriate formulae. The items whose discriminating power is less than 0.3 are rejected and others are retained.

Statistical Techniques Used

Chi-Square Test, Mean, Standard Deviation, and critical Ratio test.

Procedure of Data collection

In the part of data collection, the researcher approached the principals of selected colleges of education well in advance for permission to administer the tools to fix the date and time. After obtaining the permission the researcher administered the tools to the teacher trainees who are presented at that time and date. Before administering the tools, clear cut instructions were given to them and they were requested to provided necessary preliminary information such as name of the student teacher, sex, Academic qualifications, Social status, B.A (maths) and Mode of admission. The tools were distributed to the teacher trainees was collected under the personal supervision by the investigator.

The tools were administered to 260 teacher trainees. There was no time limit for answering the tools. Thus the data regarding pedagogical content

knowledge and attitude towards teaching of Mathematics was obtained from the teacher trainees. Despite careful supervision, it was found that some testing tools were answered partially and hence only 226 inventories could be considered for the final analysis.

Delimitation of the Study

1. This study is limited to only prospective teachers of 7 different educational colleges Visakhapatnam Municipal Corporation
2. The level of significance considered in this study is 0.05 only
3. Out of 10 units of the theoretical components of the syllabus in vogue, only 5 units (practical oriented) are selected.

Analysis and Interpretation

Relationship between Pedagogical Competency and Attitude towards teaching Tools

For this, co-efficient of correlation between the pairs of scores obtained on the two tools namely Pedagogical Competency and Attitude towards teaching is found the obtained value is 0.67. To test the significance of this value, the table showing the significant values at difference levels for different differential frequency (P No357, Garrett) is consulted. The obtained r (0.67) is greater than table value of 0.181 at 0.01 level Hence the obtained r is significant at 0.01 level. Therefore it can be inferred that Pedagogical Competency and Attitude towards teaching of Mathematics are closely associated.

Table No. 1
Joint Frequencies Table for Pedagogical Competency and Attitude Towards Teaching of Mathematics scores

	Low < 5.22	Average 6 and 15	High > 15.59	Total
< 87.8 Low Favourable	11(06.690)	25(21.50)	0 (07.80)	36.00
88 to 124 Favourable	30(26.200)	82 (84.20)	29 (30.57)	141.00
> 124.8 High Favourable	1(00.216)	28 (29.26)	20 (10.62)	49.00
	42.000	135.000	49.000	226.00

Chi - Square Test of Association Value -23.16

From table no.1, the obtained Chi - Square value is 23.16 is higher than the table value 9.488 at 0.05 level. Hence it is significant at 0.05 level. Therefore the null hypothesis is rejected, it reveals that there is a significant association between the Pedagogical Competency and Attitude towards Teaching of Mathematics of Prospective Mathematics Teachers and theirs.

Table No. 2

Critical Ratio Value of Prospective Mathematics teachers in Pedagogical Competency

Variable	N	M	SD	D	$\frac{\sigma}{D}$	C.R
Male	114	10.35	5.28	0.14	0.69	0.15@
Female	112	10.45	5.09			
Graduates	164	10.25	5.20	0.534	0.77	0.69@
Post -graduates	62	10.79	5.13			
Arts Graduates (BA maths)	156	10.26	5.027	0.44	0.77	0.55@
Ed. CET	198	10.18	5.23	1.78	0.95	1.87@
Management	28	11.96	4.65			
SC and ST	38	10.97	5.79	1.28	1.12	1.15 @
OC	68	9.69	4.89			
SC and ST	38	10.97	5.79	0.34	1.05	0.34 @
BC	120	10.62	5.13			
BC	120	10.62	5.13	0.94	0.76	1.23@
OC	68	9.69	4.89			

@ Not significant at 0 05 level.

From table No.2, It is observed that the obtained C.R Values (0.15, 0.69, 0.55, 1.87, 1.15, 0.34 and 1.23) are not significant at 0.05 level. Hence the null hypothesis is retained. That is to say that Sex, Academic qualifications (Graduates and Post

graduate), Arts B.A (maths) and, Mode of admission (Ed. Cet and Management quota) and Social status of the prospective Mathematics teachers do not have any significant difference in their Pedagogical competency in Mathematics.

Table No.3
Critical Ratio Value of Prospective Mathematics teachers in Attitude towards teaching Mathematics

Variable	N	M	SD	D	σ_D	C.R
Male	114	106.57	17.32	0.54	2.5	0.22@
Female	112	106.026	19.69			
Graduates	164	105.13	19.04	4.29	1.57	2.73**
Post-graduates	62	109.41	16.73			
Ed. CET	198	105.74	18.09	4.47	4.19	1.064@
Management	28	110.21	21.12			
SC and ST	38	108.57	16.57	3.28	3.70	0.89@
OC	68	105.29	21.0			
SC and ST	38	108.57	16.57	2.42	3.14	0.77@
BC	120	106.15	17.63			
BC	120	106.15 105.29	17.63	0.85	3.01	0.28@
OC	68	105.29	21.0			

** Significant at 0.01 level. @ Not significant at 0.05 level

From table no.3, the obtained C.R. value (2.73) is higher than 2.58. Hence it is significant at 0.01 level. Therefore the null hypothesis is rejected. In other words, the educational qualifications (Graduate and Post Graduate) have a significant difference in their Attitude towards teaching of Mathematics. Post Graduate Prospective Mathematics teachers have higher mean value (109.41) than their counter parts. That is to say that the mean difference is in

favour of Postgraduates.

From table No.3 also reveals that the obtained C.R. Values (0.22, 0.65, 1.06, 0.89, 0.77 and 0.28) are not significant at 0.05 level. Hence the null hypothesis is retained. That is to say that Sex, Arts and Commerce, Mode of admission (Ed.Cet and Management quota) and Social status of the Prospective Mathematics teachers do not have any significant difference in their Attitude towards teaching Mathematics.

Major Findings

1. There is a significant correlation between Pedagogical Competency and Attitude towards teaching of Mathematics Prospective Mathematics teachers.
2. Sex, Academic qualifications(Graduate and Post graduate), Arts and Commerce, Mode of admission(Ed. Cet and Management quota) and Social status of the prospective Mathematics teachers do not have any significant difference in their Pedagogical Competency in Mathematics.
3. The educational qualifications of prospective Mathematics teachers have a significant difference in their Attitude towards teaching of Mathematics, Postgraduate Prospective Mathematics teachers have high mean value (109.4) than their counter parts.
4. Sex, Arts and B.A(math), Mode of admission (Ed.Cet and Management quota) and Social status of the Prospective Mathematics teachers do not have any significant difference in their their Attitude towards teaching Mathematics.

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SCIENTIFIC APTITUDE OF FIRST DEGREE STUDENTS: AN INVESTIGATION

3

M.ESWARAN
Ph.D Scholar,
Department of Education,
Periyar University,
Salem-11, Tamilnadu

Dr.M. VAKKIL
Assistant Professor,
Department of Education,
Periyar University,
Salem-11, Tamilnadu

INTRODUCTION

Revolution of science has superexcellent the contemporary world in various ways. In fact, this revolution is the most significant among the different newly budding issues in the fashionable society. This has transformed the modern civilization into a scientific civilization. In this context, science has become an integral part of our life and living. It is no longer confined to the eminent scientists. Rather, knowledge of science of an individual has become almost essential irrespective of his / her status. It is also considered as an important quality parameter of a learner. An individual or learner having science interest, science attitude and science aptitude must enter in science or technical education, otherwise he / she will not successful in the field of science.

While aptitude of the students to decide future education where is from individual to individual that indicates individual's interest and learning abilities (Ramsay - 2008). Aptitude indicates the natural ability of an individual that may be scholastic, vocational, acquired or learned component

of competency to do a certain kind of work at certain level. Though certain heredity background and science attitude are helpful in determine science aptitude. Herewith other factors like physical, social and emotional developments, moral characters and science interest may also be considered for the development of science aptitude.

Scientific aptitude has been investigated by researcher, the previous studies were found that the results **Dhaval R. Patel** (2010) evaluated the scientific aptitude among secondary school students, this study revealed that there is significant difference in their scientific aptitude among boys and girls secondary school students. **Nataraj,P.N** and **Manjula** (2012) analyzed the scientific aptitude of high school students in relation to their achievement in science, and this study was found that the male and female students do not differ significantly in their scientific aptitude and the rural and urban students differ significantly in their scientific aptitude towards science. **Olatoye R.A** and **Aderogba A.A** (2011) investigate the role of students' verbal and numerical abilities

in students' performance on aptitude test, and thus this study was found that there is no significant difference between male and female students' performance in verbal ability, numerical ability and general aptitude test. **Rajib Mukhopadhyay** (2013) examined the aptitude in Physics, Scientific attitude and deep approach to study and this study was found to predict achievement in Physics is significant.

Science aptitude is a complex of interacting hereditary and Environmental determinants producing ability in science, though these abilities are possible to predict future accomplishment of a person / pupil in science and it is generate the younger scientists and technicians. So, the present investigation was conducted to analyze the scientific aptitude of first degree science students at college level.

OBJECTIVES OF THIS STUDY

- To find out the level of scientific aptitude of first degree science students.
- To find out the significant difference in Scientific Aptitude of first degree science students with respect to their following demographic variables such as Gender (male and female), Locality (rural and urban) and Type of Institution (Government and Self finance).
- To find out the significant difference in scientific aptitude of first degree science students with respect to their stream of study (Physics, Chemistry and Biology).

HYPOTHESES OF THIS STUDY

- The level of Scientific Aptitude of first degree science students is high.
- There is no significant difference in Scientific Aptitude of first degree science students with respect to their following demographic variables such as Gender (male and female), Locality (rural and urban) and Type of Institution (Government and Self finance).
- There is no significant difference in Scientific Aptitude of first degree science students with respect to their stream of study (Physics, Chemistry and Biology).

RESEARCH DESIGN OF THE STUDY

For the present study, the investigator has adopted descriptive survey method and 300 under graduate science students have been selected (the sample comprised 164 female and 136 male) from the Namakkal district in Tamilnadu. The questionnaire of Scientific Aptitude is developed by the investigator, it contains 45 items, and thus the tool was given to subject experts for the comments and suggestions before the final version was used. The split-half reliability coefficient for questionnaire of Scientific Aptitude is **0.72**. The descriptive (Mean and Standard deviation) and differential analysis (t-test and F-test) have been done.

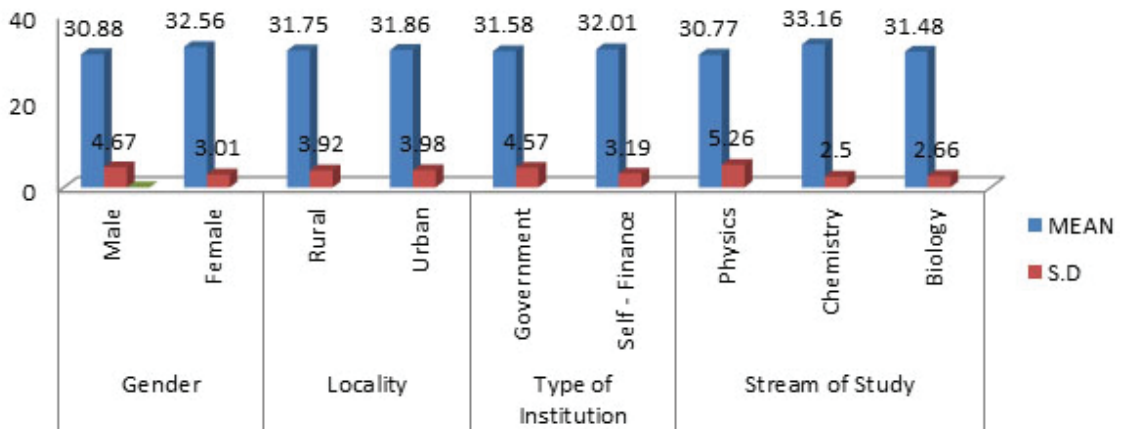
TESTING OF HYPOTHESES

Hypothesis:1: The level of Scientific Aptitude of first degree science students is high.

Table -1**Mean and S.D of scientific aptitude of first degree science students****Mid value: 22.5**

VARIABLE		SAMPLE(N)	MEAN	S.D
Gender	Male	136	30.88	4.67
	Female	167	32.56	3.01
Locality	Rural	187	31.75	3.92
	Urban	113	31.86	3.98
Types of Institution	Government	150	31.58	4.57
	Self-Finance	150	32.01	3.19
Stream of the study	Physics	113	30.77	5.26
	Chemistry	104	33.16	2.50
	Biology	83	31.48	2.66
Total		300	31.8	3.94

From the table (1) it is concluded that the total mean score is 31.8. The results shows that the first degree science students'scientific aptitude found to be above average.

Mean score of first degree science students in Scientific Aptitude

Hypothesis – 2

There is no significance difference in Scientific Aptitude of first degree science students with respect to their following

demographic variables such as Gender (male and female), Locality (rural and urban) and Type of Institution (Government and Self finance).

Table – 2

Significance of difference in scientific aptitude of first degree science students with respect to their demographic variables.

VARIABLE		SAMPLE (N)	MEAN (M)	S.D	't'-VALUE
Gender	Male	136	30.88	4.67	3.60*
	Female	167	32.56	3.01	
Locality	Rural	187	31.75	3.92	0.22@
	Urban	113	31.86	3.98	
Types of Institution	Government	150	31.58	4.57	0.93@
	Self-Finance	150	32.01	3.19	

* - Significant of 0.01 level

@ - Not Significant at 0.05 level

From the table (2) it is inferred that the calculated (gender) 't' value 3.60 which is greater than tabulated value 2.57 at 0.01 level. Consequently, the null hypothesis is not accepted. It shows that there is significant difference between male and female first degree science students in scientific aptitude. The calculated 't' values are 0.22 (Locality) and 0.93 (Type of Institution) which are lower than the tabulated value 1.96 at 0.05 level and the null hypothesis

is accepted. Therefore it is concluded that there is no significant difference between rural and urban and government and self – finance first degree science students in scientific aptitude.

Hypothesis – 3

There is no significance difference in Scientific Aptitude of first degree science students with respect to their stream of study (Physics, Chemistry and Biology).

Table – 3

Significance of difference in scientific aptitude of first degree science students with respect to their stream of study

VARIABLE		Sum of Square	df	Mean Square	F-Value
Stream of study	Between groups	319.58	2	159.79	10.96*
	Within groups	4328.41	297	14.57	
	Total	4648	299		

* - Significant of 0.01 level

From the table (3), it is inferred that the 'F' value (10.96) is greater than the tabulated value (4.60) at 0.01 level. Consequently the null hypothesis is not accepted. Therefore it is concluded that there is significant

difference in scientific aptitude of first degree science students with respect to their stream of study (Physics, Chemistry and Biology).

Table – 4

Significance of difference ('t'-test instead of Post- hoc test) in scientific aptitude of first degree science students with respect to their stream of study.

VARIABLE		SAMPLE (N)	MEAN (M)	S.D	't'-VALUE
Stream of study	Physics	113	30.77	5.26	4.31*
	Chemistry	104	33.16	2.50	
	Physics	113	30.77	5.26	1.22@
	Biology	83	31.48	2.66	
	Chemistry	104	33.16	2.50	4.40*
	Biology	83	31.48	2.66	

* - Significant of 0.01 level

@ - Not Significant at 0.05 level

From the table (4), it is inferred that the calculated 't' values 4.31 and 4.40 which are greater than tabulated value 2.57 at 0.01 level. Consequently, the null hypothesis is not accepted. Therefore it is inferred that there is significant difference between Physics

and Chemistry and Chemistry and Biology first degree science students in scientific aptitude. The remaining demographic variable (stream of study) is inferred that the calculated 't' value 1.22 which is lower than the tabulated value 1.96 at 0.05

level. Consequently the null hypothesis is accepted. Hence it is concluded that there is no significant difference between Physics and Biology first degree science students in scientific aptitude with respect to their stream of study.

SUM UP

- The first degree science students have above average in scientific aptitude.
- There is significant difference between male and female first degree science students in scientific aptitude.
- There is no significant difference between rural and urban and government and self – finance first degree science students in scientific aptitude.
- There is significant difference in scientific aptitude of first degree science students with respect to their stream of study (Physics, Chemistry and Biology). Though the Post-Hoc analysis revealed

that there is significant difference between Physics and Chemistry and Chemistry and Biology first degree science students in scientific aptitude, thus there is no significant difference between Physics and Biology first degree science students in scientific aptitude with respect to their stream of study.

CONCLUSION

Performance of scientific aptitude is the potential of a pupil to learn effectively in future engagements, it is important to develop scientific aptitude among under graduate science students. It is suggested that the scientific aptitude may be given due weightage in the National Curriculum Frame work (NCF). It is also suggested the Arts and Science colleges may arrange science based workshops, seminars, conferences, field visits, science exhibitions, science club and extracurricular activities which help to develop the students' scientific aptitude.

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RELATIONSHIP BETWEEN ACADEMIC PROCRASTINATION AND ACADEMIC ACHIEVEMENT OF STANDARD XI STUDENTS

4

V. Sasikala,
M.Phil Research Scholar,
St. Ignatius College of Education,
Palayamkottai,
Tirunelveli-627002.

Dr. M. Maria Saroja
Controller of Examinations and
Professor,
St. Ignatius College of Education,
Palayamkottai,
Tirunelveli-627002

INTRODUCTION

Education develops desirable habits, skills and attitudes which enhance personality development. "Man's power to change himself, that is to learn is perhaps the most impressive thing about him" (Thorndike, 1976). In every stage of life there are certain directions for success, those who are not versant with those directions may fail in their life. In today's society where Academic achievement has become the index of a child's future, puts a great pressure on the minds of the students and their parents. Students face special frustrations with academic tasks which develop maladaptive behaviour like procrastination in academic tasks. Due to lack of concentration on academic tasks students may feel difficulties in setting their targets for their future life. The findings of this study may provide valuable information to school counselling services about students who are more at risk for academic procrastination.

REVIEW OF RELATED STUDIES

The investigator has reviewed a good quantum of related studies. Savithri, J.J.

(2014) conducted a study on Interactive Effect of Academic Procrastination and Academic Performance on Life Satisfaction. Kalia, A. K., & Yadav, M. (2014) conducted a study on Academic Procrastination in relation to Socio-demographic variables. Balkis, M. (2013) studied on Academic Procrastination, Academic Life Satisfaction and Academic Achievement. Azar, F.S. (2013) conducted a study on Self-Efficacy, Achievement Motivation and Academic Procrastination as Predictors of Academic Achievement in Pre-College Students. Devi, N. J. (2012) studied on Academic procrastination among graduate students. The review of related studies has revealed that very few studies have been conducted on Academic Procrastination and Achievement. Hence, the investigator has conducted a study on the Relationship between Academic Procrastination and Academic Achievement of standard XI students in Tirunelveli.

SIGNIFICANCE OF THE STUDY

Education which is estimated as the right road to progress and prosperity is hindered by procrastination. Procrastination is considered a complex phenomenon

with cognitive, affective, and behavioral elements that involves the intentional postponement of an intended course of action despite awareness of possible negative consequences. Due to increased use of technology and time pressure, people put off things more in their lives. This Self-sabotaging act is a common phenomenon among all level of people particularly students. Academic procrastination is a special type of procrastination. The common form of academic procrastination among students is to wait until the last minute for submitting of assignments or to study for an examination. A potentially excellent student also may sometimes not able to achieve as per his capacities owed to procrastination. Academic procrastination has drawn research interest because of its prevalence and educational implications. Achievement has a significant influence on the quality of life. Academic procrastination is an impediment to students' academic success. It is turned to be an important educational concern for classroom instructors and administrators because of its negative psychological impact on students. It is an intriguing inability that eats away student's productivity and hurdles progress. Hence, it is the right time to understand the neuropsychological correlates of procrastination and its relation with academic achievement.

OBJECTIVES OF THE STUDY

1. To find out the significant difference if any between Academic Procrastination and its dimensions of Standard XI students with reference to the background variables such as gender, medium of instruction and group of

study.

2. To find out the significant difference if any between Academic Achievement of Standard XI students with reference to the background variables such as gender, medium of instruction and group of study.
3. To find out the significant relationship between Academic Procrastination and Academic Achievement of Standard XI students with reference to the background variables such as gender, medium of instruction and group of study.

HYPOTHESES OF THE STUDY

1. There is no significant difference between Academic Procrastination and its dimensions of Standard XI students with regard to the background variables such as gender, medium of instruction and group of study.
2. There is no significant difference between Academic Achievement of Standard XI students with regard to the background variables such as gender, medium of instruction and group of study.
3. There is no significant relationship between Academic Procrastination and Academic Achievement of Standard XI students.
4. There is no significant relationship between Academic Procrastination and Academic Achievement of Standard XI students with reference to the background variables such as gender, medium of instruction and group of study.

POPULATION AND SAMPLE OF THE STUDY

The population includes standard XI students of Tirunelveli. The investigator has used Simple Random Sampling technique and selected 686 Standard XI students studying in 15 different Schools in Tirunelveli as the sample for the study.

METHOD ADOPTED IN THE PRESENT STUDY

Keeping in mind of the purpose and population of the study the investigator has adopted Descriptive method with survey as technique for the present study.

TOOLS

- i. Academic Procrastination Assessment Scale (APAS) developed and validated

by Maria Saroja. M and Sasikala. V (2014).

- ii. Academic achievement is assessed by the marks obtained in the half yearly examination.

STATISTICAL TECHNIQUES USED

Mean, Standard Deviation, 't' test and Correlation were used to analyze the data.

ANALYSIS OF DATA

Null hypothesis 1:

There is no significant difference between Academic Procrastination and its dimensions of Standard XI students with regard to the background variables such as gender, medium of instruction and group of study.

TABLE 1

Difference between Standard XI Students in their Academic Procrastination and its Dimensions with regard to Background Variables

Dimensions of Academicprocrastination	Variable	Category	N	Mean	S.D	Calculated 't' value	Remarks
Laziness	Gender	Boys	334	8.83	2.255	2.74	S
		Girls	352	8.39	1.911		
	Medium of Instruction	Tamil	268	8.78	2.088	1.75	NS
		English	418	8.49	2.095		
	Group of Study	Arts	372	8.95	2.063	4.71	S
		Science	314	8.20	2.065		
Task aversiveness	Gender	Boys	334	17.94	3.595	5.58	S
		Girls	352	16.45	3.417		
	Medium of Instruction	Tamil	268	16.86	3.446	1.84	NS
		English	418	17.38	3.655		
	Group of Study	Arts	372	17.63	3.571	3.70	S
		Science	314	16.63	3.521		

Dimensions of Academicprocrastination	Variable	Category	N	Mean	S.D	Calculated 't' value	Remarks
Low Self-efficacy	Gender	Boys	334	17.75	3.013	2.99	S
		Girls	352	17.07	2.903		
	Medium of Instruction	Tamil	268	17.63	2.888	1.66	NS
		English	418	17.25	3.023		
	Group of Study	Arts	372	17.72	2.840	3.08	S
		Science	314	17.02	3.088		
Fear of failure	Gender	Boys	334	11.31	2.969	2.98	S
		Girls	352	10.66	2.683		
	Medium of Instruction	Tamil	268	11.14	2.711	1.20	NS
		English	418	10.87	2.921		
	Group of Study	Arts	372	11.42	2.697	4.51	S
		Science	314	10.45	2.923		
Poor Time management	Gender	Boys	334	8.88	2.085	2.31	S
		Girls	352	8.53	1.930		
	Medium of Instruction	Tamil	268	8.80	1.997	1.08	NS
		English	418	8.63	2.023		
	Group of Study	Arts	372	8.89	1.984	2.76	S
		Science	314	8.47	2.027		
Evaluation anxiety	Gender	Boys	334	10.06	2.486	1.30	NS
		Girls	352	10.31	2.525		
	Medium of Instruction	Tamil	268	10.43	2.694	2.05	S
		English	418	10.03	2.370		
	Group of Study	Arts	372	10.26	2.517	0.85	NS
		Science	314	10.10	2.497		
Difficulty in Decision making	Gender	Boys	334	11.69	2.728	1.05	NS
		Girls	352	11.47	2.645		
	Medium of Instruction	Tamil	268	11.24	2.703	2.66	S
		English	418	11.79	2.656		
	Group of Study	Arts	372	11.59	2.760	0.18	NS
		Science	314	11.55	2.600		
Over-confidence	Gender	Boys	334	10.76	2.286	0.33	NS
		Girls	352	10.82	1.932		
	Medium of Instruction	Tamil	268	10.65	2.021	1.37	NS
		English	418	10.88	2.164		
	Group of Study	Arts	372	10.67	1.990	1.68	NS
		Science	314	10.94	2.240		

Dimensions of Academic procrastination	Variable	Category	N	Mean	S.D	Calculated 't' value	Remarks
Overall academic procrastination	Gender	Boys	334	97.21	12.196	4.01	S
		Girls	352	93.69	10.765		
	Medium of Instruction	Tamil	268	95.53	11.764	0.23	NS
		English	418	95.32	11.524		
	Group of Study	Arts	372	97.13	10.963	4.29	S
		Science	314	93.36	12.032		

It is inferred from table 1 that, there is no significant difference between boys and girls students in the dimensions of evaluation anxiety, difficulty in decision making and over-confidence, but there is significant difference between them in the dimensions of laziness, task aversiveness, low self-efficacy, fear of failure, poor time management and overall academic procrastination. There is no significant difference between Tamil and English medium students in the dimensions of laziness, task aversiveness, low self-efficacy, fear of failure, poor time management, over-confidence and overall academic procrastination, but there is significant difference between them in the dimensions

of evaluation anxiety and difficulty in decision making. There is no significant difference between arts and science group students in the dimensions of evaluation anxiety, difficulty in decision making and over-confidence, but there is significant difference between them in the dimensions of laziness, task aversiveness, low self-efficacy, and fear of failure, poor time management and overall academic procrastination.

Null hypothesis 2

There is no significant difference between Academic Achievement of Standard XI students with regard to the background variables such as gender, medium of instruction and group of study.

TABLE 2

Difference between Standard XI Students in their Academic Achievement with regard to Background Variables

Variable	Category	N	Mean	S. D	Calculated 't' Value	Remarks
Gender	Male	334	59.50	18.021	0.74	NS
	Female	352	58.50	17.534		
Medium of Instruction	English	268	68.85	16.797	12.99	S
	Tamil	418	52.66	15.338		
Group of Study	Arts	372	58.64	19.217	0.55	NS
	Science	314	59.40	15.900		

It is inferred from table 2 that, there is no significant difference between Academic Achievement of Standard XI students with regard to the background variables such as gender, and group of study. But, there is significant difference between Academic

Achievement of Standard XI students with regard to medium of instruction.

Null hypothesis 3:

There is no significant relationship between Academic Procrastination and Academic Achievement of Standard XI students.

TABLE 3

Relationship between Academic Procrastination and Academic Achievement of Standard XI Students

N	ΣX	ΣY	Σ X ²	ΣY ²	ΣXY	Calculated 'γ' value	Remarks
686	40465.17	65437	2603158.6	6334223	3847643.9	-0.087068	S

(At 5% level of significance, for 684df the table value of 'γ' is 0.062)

It is inferred from table 3 that, there is significant negative relationship between Academic Procrastination and Academic Achievement of standard XI students.

between Academic Procrastination and Academic Achievement of Standard XI students with regard to the background variables such as gender, medium of instruction and group of study.

Null hypothesis 4:

There is no significant relationship

TABLE 4

Relationship between Academic Procrastination and Academic Achievement of Standard XI Students with regard to background variables

CATEGORY	N	SUM X	SUM Y	SUM X ²	SUM Y ²	SUM XY	Calculated 'γ' value	Remarks
Boys	334	19874.58	32458	1290779	3203734	1928321	-0.04215	NS
Girls	352	20590.58	32979	1312379	3130489	1919323	-0.14816	S
English	268	18452.42	25603	1345825	2482895	1761741	-0.02056	NS
Tamil	418	22012.75	39834	1257333	3851328	2085903	-0.16076	S
Arts	372	21814.67	36123	1416253	3552253	2112198	-0.07824	NS
Science	314	18650.5	29314	1186906	2781970	1735446	-0.09525	NS

It is inferred from the above table that, there is significant relationship between Academic Procrastination and Academic

Achievement of girls and Tamil medium students of standard XI. There is no significant relationship between academic

procrastination and academic achievement of boys, English medium, arts group and science group students of standard XI.

FINDINGS AND DISCUSSIONS

Academic Procrastination of Standard XI Students

In terms of gender: The 't' test result shows that boys procrastinate more in academics than their counterparts. Especially in the dimensions of laziness, task aversiveness, low self-efficacy, fear of failure and poor time management. This may be due to the fact that boys are easy going and lethargic towards their studies. They spend most of their time in internet, social Media etc. They are courageous to face all the problems whether it is voluntarily created due to their laziness or aversiveness. They get influenced by their peer and indulge more in pleasurable activities than studying. They lack in efforts to channelize their emotions to get involved in their academic tasks. But they fear for failures as it affects their dignity and reputation among their friends. Hence, boys procrastinate to a greater extent than their counterparts. Findings of the present study is consistent with the previous study of **Devi, N.J. (2012)** where result showed that boys involve more in academic procrastination than their counterparts. The result of present study contradicts with the study of **Sharma, M. & Kaur, G. (2011)** which showed that girls procrastinate more in academics than boys. Results of the Studies of **kalia & Manju (2014)** and **Savithri, J. J. (2014)** showed no gender difference in academic procrastination.

In terms of medium of instruction: The 't' test result shows that the Tamil medium students have higher evaluation anxiety and difficulties in making decisions than the English medium students. This may be due to the fact that due to globalization there is competition everywhere. Tamil medium students who lack proficiency in world language have difficulties in face it. The importance of communicative skills in admissions in reputed institutions and jobs adds to their anxiety. They experience nervousness when their behaviour or achievements is being evaluated. They fear for to be found deficient or inadequate by others. They doubt their efficiency and depend on others for taking vital decisions. These induce them to wear the mask of withdrawal or escapism from it and fall prey to procrastination.

In terms of group of study: The 't' test result shows that the arts group students have greater signs of academic procrastination than the science group students especially in the dimensions of laziness, task aversiveness, low self-efficacy, fear of failure and poor time management. This may be due to the fact that arts group students have no much of practical classes, record works and subject burden like that of the science group students. Arts group classes are based on lectures and less of interaction which there is no room for active participation. Learning by doing is not encouraged. These trim down their motivation and boost their laziness towards academic tasks. It also enhances their attitude of studying in the last moment and thereby increases their aversiveness and irregular study habits. These all combine

together and make the arts group students involve in procrastination.

Academic Achievement of Standard XI Students

In Terms of Medium of Instruction:

The 't' test result shows that the Tamil medium students are better than the English medium students in their academic achievement. This may be due to the fact that, learning through their mother tongue helps them to understand and comprehend the concept easily and thereby avoid rote memorization. They also strive hard to compete with their counterparts. Studying in familiar language tapers their enthusiasm and goal towards achievement. These enhance their inclination on studies and score well than their counterparts.

Relationship between Academic Procrastination and Academic Achievement:

The "γ" test result shows that, there exists a significant negative relationship between Academic Procrastination and Academic Achievement. It reveals that when Academic Procrastination increases Academic Achievement decreases. This may be due to the fact that Pampering, permissive and liberal attitude of the parents develop laziness or lethargic behaviours in their children. The wide available technological gadgets distract the students easily and push academic tasks to least priority. Parental high expectation and high academic pressures put in schools by teachers' causes many psychological problems. Students depend on internet and plagiarize their assignments easily. They don't follow a systematic study time

or utilize their time productively. Lumping of tasks leads to stressful overnight study without utilizing their full capacity. These boost psychological problems like stress, depression and anxiety. To protect themselves from unpleasant experiences like embarrassment, rejection students procrastinate. As a result, their concentration, efficiency and real talent in academics is hindered. Finding of the present study is supported by the studies of **Savithri, J.J. (2014)** and **Balkis, M. (2013)** which shows significant negative correlation between Academic Procrastination and Achievement.

In terms of girls: The "γ" test result shows that, there is significant negative relationship between academic procrastination and academic achievement of girls students of standard XI. This may be due to the fact that many students including the girl students have fallen prey to this self regulation failure. Nowadays Girl students' are pampered and are treated equal to boys. They join in many extra-curricular activities and their interest is poured towards various fields. Many Girls use mobiles and waste their time in browsing through internet. They deviate from academic tasks and involve in self decoration like going to beauty parlours which in turn have reduced their interest in academics and postpone completion of their assignments within the time frame. These make them involve in procrastination and adversely affect their achievement.

In terms of Tamil medium students: The "γ" test result shows that there is significant negative relationship between

academic procrastination and academic achievement of Tamil medium standard XI students. This may be due to the fact that Tamil medium students doubt their ability and feel inferior which prevent them from participating in competitions. The availability of reference materials in Tamil is also very limited. As they learn the concepts through their mother tongue they become overconfident. Hence, they procrastinate and do not spend quality time in studies which is reflected in their academic achievements.

CONCLUSION:

The present investigation reveals that most of the students are not serious in their studies. Hence, there arises the need for the parents, teachers and community to encourage the students to plan their academic works properly. Their responsibility also extends to help them in avoiding and overcoming their habit of procrastination. The results may be an eye opener for all of us to overcome procrastination which has great adverse effects not only in academic but also in their life.

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RUDIMENTARY LEARNING DIFFICULTIES OF PRIMARY SCHOOL CHILDREN

5

Dr. (Mrs.) N.L.N.Jayanthi
Associate Professor
Department of Education
Annamalai University

AWARENESS OF E-WASTE MANAGEMENT AMONG SCHOOL TEACHERS E. Neelamegam* & Dr. R. Selvaraju**

ABSTRACT

A survey was conducted to find the awareness of electronic waste management among school teachers. The sample for the present study consisted of seven hundred fifty school teachers selected randomly from sixty schools in Tirunelveli district in Tamil Nadu. The objectives were, to find out whether there is any significant difference in electronic waste management among school teachers on the basis of their demographic variables. The study revealed that there no is significant difference in awareness of E-waste management with respect to gender, types of the school and subject. (ii) There is significant difference among boys, girls and co-education school teachers in their awareness of E-waste management.

INTRODUCTION

The rapid growth of information and telecommunication technology has penetrated nearly every aspect of modern

life even in the most remote area of the developing countries. The advancement of the technology has led to rapid decrease in the product lifetime and generating large quantity of waste electronic equipment (e-waste). The rapid Technological progress forced manufacturer for production of new units, which ultimately adds to the number of old electronic equipment destined for landfills/recycling. The typical life span of a computer in the advanced countries is about 2 years. As the old PC, mobile, laptop and other electronic equipments become obsolete, they are replaced by the new one and added to the quantity of e-waste. The consumer electronics is now the fastest growing sector of municipal solid waste in both developed and developing countries. Most of the consumers are unaware of the toxic materials present in the electronic goods. The health impacts of the mixtures and material in the products often are not known. The production of semiconductors, printed circuit boards, disk drives, monitors etc. uses hazardous chemicals and the

workers involved are reported to be affected by various diseases. Teachers must have awareness about environmental problems so that they can play their role effectively on managing the waste properly. Hence, the study is an attempt to know about the level of awareness in e-waste management among school teachers.

OBJECTIVES OF THE STUDY

1. To find out the level of awareness in E-waste management of school teachers
2. To find out whether there is any significant difference in E-waste management of school teachers.

Research Scholar*, Assistant professor**, Department of Education, Manonmaniam Sundaranar University, Tirunelveli, Tamil Nadu.

Hypothesis of the Study

1. To find out whether there is any significant difference in E-waste management of school teachers with respect to select demographic variables.

Method Adopted

The present study attempts to explore awareness of E-waste among school teachers. As far as, the problem and objectives of the study is concerned the investigator selected the survey method for conducting the study.

Population and Sample of the Study

The population for present study consists of school teachers from different primary, secondary and higher secondary schools in Tirunelveli district in Tamil Nadu. The sample for the present study comprises of 750 school teachers were selected. The investigator has selected by using simple random sampling technique.

Establishing Validity

“Lickert item Wise Analysis” was used validity was found out to ensure the validity of the EWS. (ii) The EWS was given to a panel of expert in the colleges of education, colleges of arts, environment science and science teachers in among schools. Based on the opining and suggestion given by the experts, some of the statements in the EWS were modified. Thus the tool was found to be valid using expert validation and “Lickert Item wise Analysis

Establishing Reliability

In the present study the reliability coefficient of EWS was calculated using test-retest method. The scale was administered twice among 75 teachers working in primary, secondary and higher secondary schools with the time of two weeks. Their responses were valued, and the consistencies between the scores were analysed using rank correlation. The coefficient of correlation between the two

scores was found to be 0.96 using test-retest method. Thus tool was found to be reliable.

HYPOTHESIS TESTING

Null hypothesis-1

There is no significant difference in awareness of E-waste management of school teachers with respect to gender

Table -1
Difference between male and female school teachers in their awareness of E-waste management

E-Waste Management	Male N=370		Female N=380	
	Mean	SD	Mean	SD
Management of EW	24.41	4.574	24.26	4.346

NS- Not significant, S- Significant

It is inferred from the above table that the calculated value of 't' (0.46) is less than the table value of 't' (1.96) at 5% level of significance for df 748. Hence, the null hypothesis is *accepted*. Thus, there is no significantly difference between male and female school teachers in their awareness of E-waste management.

Null hypothesis -2

There is no significant difference in their awareness of E-waste management of school teachers with respect to types of the school.

Table -2

Difference between among government, self-financing and government aided school teachers in their awareness of E-waste management

E-waste Management	Sources of variation	Sum of square
Types of the School	Between	12.824
	Within	14869.508

NS- Not significant, S- Significant

It is inferred from the above table that the calculated value of 'F' (0.322) is less than the table value of 'F' (3.00) for df (2,747) at 5% level significance. Hence, null hypothesis is *accepted*. Thus, there is no significantly difference among government, self-financing and government aided school teachers in their awareness of E-waste management.

Null hypothesis- 3

There is no significant difference in awareness of E-waste management of school teachers with respect to nature of the school

Table - 3

Difference between among boys, girls and co-education school teachers in their awareness of E-waste management

E-Waste Management	Sources of variation	Sum of square
Nature of the School	Between	121.816
	Within	14760.516

NS- Not significant, S- Significant

It is inferred from the above table that the calculated value of ‘F’ (3.082) is greater than the table value of ‘F’ (3.00) for df (2,747) at 5% level significance. Hence, null hypothesis is **rejected**. Thus, the boys, girls and co-education school teachers differ significantly in their awareness of E- waste management

While, comparing the means scores of nature of the school, the difference was found to be the girl’s school teachers are better than Boys and co-education school teachers in their awareness of E-waste management

Null hypothesis -4

There is no significant difference in awareness of E-waste management of school teachers with respect to location of the school

Table -4

Difference between among rural, urban and semi urban school teachers in their awareness of E-waste management

E-waste management	Sources of variation	E-Waste Management		Calculated F	Sources of variation	Sum of square
		Sum of square	Mean square of variance			
Location of the School	Between	162.193	507.097	3.082	NS-Not significant, S- Significant	125.126
	Within	1472.30	47757.206			

NS- Not significant, S- Significant

It is inferred from the above table

that the calculated value of ‘F’ (4.115) is greater than the table value of ‘F’ (3.00) for df (2,747) at 5% level significance. Hence, null hypothesis is **rejected**. Thus, the rural, urban and semi-urban school teachers differ significantly in their awareness of E-waste management.

While, comparing the means scores of location of the school the difference was found to be the urban school teachers are better than semi-urban and rural school teachers in their awareness of E-waste management.

Null hypothesis -5

There is no significant difference in awareness of E-waste management of school teachers with respect to subjects

Table - 5

Difference between among physical science, biological science, language, math and history subject school teachers in their awareness of E-waste management

It is inferred from the above table

that the calculated value of ‘F’ (1.579)

is less than the table value of 'F' (2.38) for df (4,745) at 5% level significance. Hence, null hypothesis is *accepted*. Thus, the physical science, biological science, language, math and history subject school teachers do not differ significantly in their awareness of E- waste management.

Finding of the Study

1. 17.2% of school teachers have low, 58.0% of them have average and 24.8% of them have high level of awareness in E-waste management.
2. There is no significantly difference between male and female school teachers in their awareness of E-waste management.
3. There is no significantly difference among government, self-financing and government aided school teachers in their awareness of E-waste management.
4. The boys, girls and co-education school teachers do not differ significantly in their awareness of E- waste management. While, comparing the means scores, the girl's school teachers are better than Boys and co-education school teachers in their awareness of E-waste management.

Mean square of variance	Calculated value of 'F'	Table value of 'F' at 5% level	Remark
31.281	1.579	2.38	NS
19.808			

5. The rural, urban and semi -urban school teachers differ significantly in their awareness of E-waste management. While, comparing the means scores, the urban school teachers are better than semi urban and rural school teachers in their awareness of E-waste management.
6. There is no significantly difference among physical science, biological science, language, math and history subject school teachers in their awareness of E- waste management.

Recommendation of the Study

- ❖ Teachers will be able to connect the real-world activities to classroom lessons, and help students understand the importance of e-waste recycling as the number of outmoded electronic devices proliferates.
- ❖ Need to design e-waste awareness programmes to educate the community on the impacts and management of e-waste.
- ❖ Awareness program on e-waste for school children and general public.
- ❖ The channels for effective collection of e-waste needs to be set-up and need to be effectively popularized

among masses.

- ❖ The Government needs to undertake a massive awareness programmes to encourage e-waste collection for safe disposal and recycling. A partnership among all stakeholders is vital for the success of the process.

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DEVELOPMENT AND STANDARDIZATION OF AWARENESS TEST ON HEARING DISABILITY

6

Dr. P. RENUKA
Assistant Professor,
Dept of Education,
S.P. Mahila Visvavidyalayam,
Tirupati (AP).

qualitative evaluation of EMOTIONAL INTELLIGENCE strategy

Dr. P. SRINIVASAN

Asst. Professor, Dept. of Education

Tamil University, 613 010

Thanjavur, Tamil Nadu, India

email: seenuthilaka@gmail.com

Mobile: 9443460093

Introduction

Being closely associated to teacher education I have noticed that education provided by the schools generally centered upon cognitive aspect of the child only and not on affective and psychological aspects. Even in the cognitive domain only knowledge and comprehension components are

stressed. Teachers have cognitive and as well psychomotor related competencies but many teachers lack in emotion related competencies. Let me give some emotional outbursts which have happened in educational institutions across India to prove this.

“Babiya Chatterjee (22) a fourth year B.Tech. Student of IIT, Kanpur committed suicide on 40th convocation day of the institute, because she cheated her parents that she had graduated” (as Cited in Srinivasan).

“A teacher was stabbed to death in the classroom of a Chennai school, allegedly by 15 years-old student who was upset at being repeatedly reprimanded by her for not doing well in studies”. (Teacher was stabbed to death in the classroom of a Chennai school).

“Suresh 45 year’s old principal of Infant Jesus College of engineering, Keezha Vallanad in Tuticorin District, was fatally attacked with long knives as soon as he got out of his car. The suspension of a final year aeronautical engineering student, for his behavior on and off the college campus, allegedly provoked him to murder the principal” (Vengeful student’s

murder principal).

Dilkush Saharia, 16 year-old boy, studying in a government school in Rajasthan, allegedly committed suicide after being humiliated and beaten by his teacher (Student committed suicide after being humiliated and beaten by his teachers).

I have to add that above mentioned emotional outbursts are like tip of the iceberg. Many such incidents are happening across the length and breadth of our country. Some of the incidents are reported in media like above and rest are buried. These incidents does not spare even apex institute such as Indian Institute of Technology. These incidents show that the teachers too have to be trained in emotional capabilities' and therefore such outbursts do not occur in future.

Education has not to be in parts. It has to be given as a whole as suggested by Krishnamurthy (1992)

- ✓ Educating the whole person (all parts of the person)
- ✓ Educating the person as a whole (not as an assemblage of parts) and
- ✓ Educating the person within a whole (as part of society, humanity, nature, etc.)

Qualitative research is holistic, context specific and based on inductive logic (Rada Mohan, 2015). I have seen plenty

of quantitative evaluation of emotional intelligence strategy using descriptive, differential and inferential statistics. So far I have come across one qualitative evaluation of emotional intelligence strategy by Fer (2004).

The focus of this paper is to quantitatively evaluate emotional intelligence strategy given to secondary teacher trainees so that I can gain an understanding of the experience obtained by the student teachers. I purposefully selected the sample and given emotional intelligence strategy. From the sample five were taken to form focus group. I interviewed the members of focus group to gain an understanding of the lived experience. I analyzed the data from the perspective of the phenomenological paradigm. According to Van Manen (1990), 'phenomenology is an exploration of the essence of lived experience'. (as cited in Pandya, 2010).

What is concept of Emotional Intelligence?

Emotional Intelligence is the art of managing emotions, understanding them and doing worthwhile activities. The success of a person entirely depends on the art of managing emotions which includes practical skills and the ability to handle people. Definitions are the formal statements of the meaning or significance of a word or phrase. Emotional Intelligence is, perceiving one's own and other's emotions, understanding them and using them in thought and action. Following

are some of the definitions of emotional intelligence given by renowned psychologists. Salovey and Mayer (1990) conceptualized the term emotional intelligence as the subset of social intelligence that involves the ability to monitor one's own and others feelings and emotions, discriminate among them and to use information to guide one's thinking and action. (as cited in Bharwaney, 2001). Bharwaney (2001) defined emotional intelligence as being emotionally intelligent involves tuning into emotions, understanding them and taking appropriate action.

How Emotional Intelligence is useful in classrooms?

As I have pointed out in the introduction section that emotional outbursts are occurring in educational institutions. Outbursts can be reduced to a larger extent if emotion are managed by the teachers and students. This is supported by result of the survey Panda and Singahal's (2009) that there is a positive moderate correlation between teachers' work behavior and emotional intelligence. If principal's emotional intelligence, then there is better relationship between teachers and principal and between principal and students. This can be evidenced from Calderin (2005) who reported that emotional intelligence of the principal had an influence upon the collegial relations. Does higher educational qualification increases emotional intelligence?

I don't think so. There can be little correlation between educational qualification and emotional intelligence. Alavandar (2006) studied "Emotional Intelligence of Elementary School Teachers" and reported further educational qualification does not significantly influence the emotional intelligence of teachers.

Participants

With this in mind I developed emotional intelligence strategy and given to 40 secondary teacher trainees. Purposive sampling technique was followed in selecting the sample. Four female and one male were selected from the forty to form the focus group. The age of the participants ranged between 21 and 24. Of these 5 participants, 2 had undergraduate degree and 3 had post graduate degree. Demographic characteristics of participants are illustrated in table 1.

Table 1: Demographic Characteristics of Participants

Gender	Female
	Male
Age	21 – 22
	23 – 24
Education	UG
	PG

Procedure

I developed emotional intervention strategy based on Daniel Goleman’s 25 components of emotional intelligence. ‘Strategy’ refers to a series of well-planned actions for achieving an aim. The twenty five components are as given under five domains such as self awareness, self regulation, motivation, empathy and social skills. Concepts would be easily assimilated and be in a position of application stage if it is taught through activities. Hence I gave priority to activities. I planned two activities for each component. So, for twenty five components 50 activities are provided. In general the activities are made to be in the area of education. The program included a wide variety of activities for real life and classroom situations. These activities provided active participation through specific and various strategies such as lectures, games, brainstorming, questions and answers, music, team work, storytelling, drawings, discussing scenarios and cases, presentations, sharing experiences, feelings, and ideas. The final step is emotional expression. Here, I

made secondary teacher trainees to express the emotion of the component taken. This expression of emotion shows the proficiency of knowledge in the concerned component.

	1	20
	2	40
	3	60
	2	40
Evaluation	3	60

I qualitatively evaluated the emotional intelligence strategy using focus group interview.

The evaluation was on the basis of secondary teacher trainees’ specific experiences attained during the strategy. I also explored secondary teacher trainee’s perceptions about the implications of emotional intelligence skills in classroom situations. Five secondary teacher trainees were selected to form focus group. The willingness and co-operation on the part of the sample was the main criteria to select them. I used face-to-face, semi structured interview. According to Fraenkel and Wallen (2000), “Interviews are best conducted toward the end of a study, however, rather than at the beginning, as they tend to shape responses to the researcher’s perceptions of how things are” (as cited in Fer, 2004). A focus group is an unstructured method of group interviewing design to yield contextually rich information about a topic in an efficient and quick manner. Focus group is particularly useful in monitoring studies, in needs assessments, and program evaluations, which provide an exploratory approach and may be more effective in certain research processes than the more traditional ones. Focus group provides access to gather experience and interaction of participants on topics that are difficult to observe or rare in occurrence.

I constructed an interview guide, which consisted of 10 questions for the evaluation of emotional intelligence strategy. This interview guide was useful in making sure that the focus on main points was not lost and the important relevant questions were asked during the group assemblies, thus serving as an outline of the

focus groups. Prior to the start of the interview, I ensured the 5 B.Ed. trainees' willingness to participate in the interview section and their intention to contribute time and input to a focus group activity. All participants were willing to participate in the interview. Each B.Ed. trainee received an interview guide and was also informed verbally about its contents. They were also informed that any findings arising out of the interviews would be kept in complete confidentiality.

Interview lasted approximately 2 hours. During the interview the answers were recorded. I served as the moderator. The Investigator introduced the purpose and topic to the focus group, posed questions verbally. Participants were also given an explanation in terms of suitable ways to respond to questions and interaction with others was felicitated in the group. Interview was intended to enable to express their individual experiences as freely as possible regarding the emotional intelligence strategy and to talk spontaneously with me. Each the participants were also free to supplement additional questions to clarify and probe relevant issues. Care was taken not to direct, judge, or impose any effects to the participants in the interview process.

Data Analysis

The interview transcripts were the main source of data because of length and coverage of the questions. The transcripts

were read word for word. The collected data were presented using descriptive and interpretive reporting methods. Five secondary teacher trainees were interviewed in order to get his / her opinions about the emotional intelligence strategy through the interviews. Information gathered from the interview was analyzed with code number being given to each participant instead of using them by names and the results were presented in this section. Ten main themes in 21 categories were organized and discussed according to responses of participants. Secondary teacher trainees' responses were presented in table 2.

Table 2: Consolidated Responses of Secondary Teacher Trainees in FGI

<i>Trainees' Experience of the Emotional Intelligence Strategy</i>	N
Gaining useful skills both for classroom and for life	5
Gaining useful skills both for classroom and for life	-
<i>Trainees' Expectation of the Emotional Intelligence Strategy</i>	N
Satisfied	5
Not Satisfied	-
<i>Trainees' Benefits of the Emotional Intelligence Strategy</i>	N
Benefitted	5
Not Benefitted	-
<i>Trainees' Enhancement of Emotional Intelligence</i>	N
Enhanced	5
Not Enhanced	-
<i>Trainees' Enhancement of Teaching Competency</i>	N
Enhanced	5
Not Enhanced	-
<i>Activities Applicable to Classroom</i>	N
All activities are applicable	5
Some activities are not applicable	-
<i>Development of Emotional Intelligence for students</i>	N
Needed	5
Not needed	-
<i>Classroom Climate of Emotional Intelligence Strategy</i>	N
Positive and effective Climate	5

Negative and ineffective Climate	satisfied".
Strength and weakness of the Emotional Intelligence Strategy	N Trainee who hold this idea
Useful experiences both for classroom and for life	5 1, 2, 3, 4, 5
Time was not enough	III. Secondary Teacher Trainees' Benefits of the
More number of sample	5 1, 2, 3, 4, 5
Suggestions	Emotional Intelligence Strategy
Less Sample	5 1, 2, 3, 4, 5
Some more time needed	5 1, 2, 3, 4, 5

As seen in table 2, all the trainees benefitted from the model. Some replies are as follows;

I. Secondary Teacher Trainees' Experience of the Emotional Intelligence Strategy

As seen in table 2, all the trainees expressed they have gained useful skills for both classroom and life. Some replies are as follows;

Trainee 1 said, "I gained useful skills which I do not know previously".

Trainee 1 said, "I know now components of emotional intelligence. Now I can apply them in my life".

Trainee 4 said, "Due to this model self development increases. If the self development of a human being increases, then the whole nation will progress".

Trainee who hold this idea	Trainee said, "The important outcome
1, 2, 3, 4, 5	is that I can teach better now".
Trainee who hold this idea	Trainee 5 said, "This was useful in
1, 2, 3, 4, 5	knowing my emotions and managing them".
Trainee who hold this idea	IV. Secondary Teacher Trainees' Expectation of
1, 2, 3, 4, 5	the Emotional Intelligence Strategy
Trainee who hold this idea	As seen in table 2, all the trainees
1, 2, 3, 4, 5	expressed their expectations were satisfied.
Trainee who hold this idea	Some replies are as follows;
1, 2, 3, 4, 5	
Trainee who hold this idea	Trainee 2 said, "I do not know about
1, 2, 3, 4, 5	emotional intelligence. Now I am happy that
Trainee who hold this idea	I know it"
1, 2, 3, 4, 5	Trainee 4 said, "The expectations are

IV. Secondary Teacher Trainees' Enhancement of Emotional Intelligence

As seen in table 2, all the trainees expressed enhancement in their emotional intelligence. Some replies are as follows;

Trainee 2 said, "My emotional intelligence competency has increased. Stress and tension has reduced. This gives me pleasure".

Trainee 5 said, "I frequently get anger. Due to emotional intelligence skills I reduced my anger".

V. Secondary Teacher Trainees' Enhancement of Teaching Competency

Looking at the table 2, all the trainees expressed enhancement in their science teaching competency. Some replies are as follows;

Trainee 3 said, "By the use of motivation, achievement drive and optimism my teaching skills have been improved".

Trainee 4 said, "Previously I used to teach without understanding students feelings. Now, I know to use empathy. I understand my students and then teach".

VI. Activities Applicable to Classroom

Looking at the table 2, all the trainees said that the activities are applicable in classroom settings. Some replies are as follows;

Trainee 1 said, "I did not know that many of these activities could be used in classroom. Now I realize if these varieties of activities are used, then my teaching competency will improve".

Trainee 5 said, "All the activities are good. It is applicable in day to day classroom teaching".

VII. Development of Emotional Intelligence for students

From the table 2, all the trainees expressed that student emotional intelligence has to be developed. Some replies are as follows;

Trainee 3 said, "If the emotional intelligence of the students is developed, then their life will become better".

Trainee 2 said, "Since emotional intelligence increases success in one's life. It is an urgent need to students".

VIII. Classroom Climate of Emotional Intelligence Strategy

As seen in the table 2, all the trainees said that the classroom climate was positive and effective during the strategy intervention. Some replies are as follows;

Trainee 1 said, "There was an adequate explanation. Activities made us highly motivated towards the programme".

Trainee 4 said, "During the execution of the programme, trainer to participants' interaction is more than student to student interaction".

IX. Strength and Weakness of Emotional Intelligence Strategy

From the table 2, all the trainees said that emotional intelligence strategy was useful

in many ways. The weakness is due to number of sample and time allotted per component. Some replies are as follows;

Trainee 1 said, "Now I am able to handle situation without conflicts".

Trainee 2 said, "I try to incorporate innovativeness in my teaching".

Trainee 3 said, "The number of sample 40 is high. It can be reduced".

Trainee 5 said, "Still the time allotted per component can be increased. So, that the even a slow learner could be able to understand".

X. Suggestions

From the table 2, all the trainees suggested to reduce number of sample and to increase the time allotted per component. Some replies are as follows;

Trainee 1 said, "The number of sample can be approximately 20 per programme".

Trainee 2 said, "The time per component can be increased by 15 minutes so that emotional expression can be better".

Discussion and Findings

After the interview I examined the linkages between 21 different categories and 10 themes. These different themes and categories provide a certain amount of information when described singularly but can provide even more if one views them as a whole whereby one can compare them with each other.

The results of this focus group interview suggest that the emotional intelligence strategy worked well for all the trainees. It provided the opportunities for integration of most of the strands of the strategy, allowing participants to synthesize information and skills derived from the various emotional intelligence activities. It helped them to gain useful information and encouraged them to adopt ways of using emotional intelligence activities in the classroom. It has improved their teaching competency. The importance of the necessity of incorporating emotional intelligence in teaching-learning activities has been realized.

As the responses organized from individual interviews were categorized, an interesting pattern seemed to emerge, which showed that almost all the participants interviewed regarded the use of emotional intelligence activities as being necessary not only for their classroom, but also for their own private and daily life. Their teaching competency particularly teaching activities innovatively in classroom process have developed. There is a resemblance, related

to emotional intelligence activities for the classroom, between some of the perceptions of the trainees of the current study and those of Tucker, Sojka, Baone & McCarthy (2000) study which supported the argument that, although lectures and readings can promote an understanding of emotional intelligence, it is the practical activities and the experience gained that helps to enhance students' social and emotional learning (as cited in Fer, 2004).

To conclude, the focus group interview explored the experiences and perspectives of participants on emotional intelligence strategy and teaching competency. It also threw light on how they felt about the strategy and its effect on the teaching competency as well as on their personal lives.

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