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INDIVIDUALIZING EDUCATION FOR ALL LEARNERS

Dr. Clay M. Starlin*
Dr. Sue Fan Foo**

Abstract

India is a wonderously diverse country. With such differences comes significant educational challenges regarding how to best accommodate the variety oflearners. The Indian Right to Education Act (2010) is bringing substantially more students into Indian schools. Many of these students are from poor or disadvantaged backgrounds and have limited or no educational experience thus requiring individualized attention. The Inclusion philosophy within the Persons with Disabilities Act (1995) promotes including differently abled children in regular schools. These children also require individualized attention. In fact, since each student is unique, the preferred model is to individualize educational programs to match each student's developmental level, strengths, interests and needs.

This article addresses four important aspects of Individualized Education: (1) the Measurement Foundations of Individualized Education, (2) Two Critical Componentsfor Student Success, (3) Organizing a Classroom for Student Learnng and (4) Four Effective Instructional Tactics.

Key words: *Individualised Education, Mastery Criteria, Performance Objectives, Effective Instructional Tactics, Constrained Practice,etc.*

Measurement Foundations of Individualized Education

In order to individualize educational programs we must first be able to monitor student learning. Student learning data alerts us to whether a current program is working. If the program is not working we can make needed adjustments. There are four elements that are essential to defining and monitoring student learning: (1) using frequency (count/ time) as our base performance measure, (2) establishing frequencybased mastery criteria, (3) writing precise performance objectives which include thefrequency based mastery criteria and (4) collecting short, frequent measurements to view change in performance –learning.

Frequency (Count/Time) Most Sensitive Level of Performance Measure

Frequency (count/time) is the most sensitive measure of student performance. It involves directly counting the number of correct & incorrect responses of the performance of interest (e.g. words read, words written, kind comments, tasks completed) and recording the time in minutes during which the performance was observed. We then compute the performance frequency

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(This article is based on an International workshop lead by Dr. Clay M. Starlin and Dr. Sue Fan Foo, conducted at St. Thomas College of Teacher Education Pala, Kerala, India on March 15, 2013.)

by dividing the count by the minutes observed.

Non-frequency measures, are less sensitive because they are Incomplete and/ or Indirect. Table 1 demonstrates the importance of complete information (both count & time) while Table 2 highlights the difference in sensitivity of a direct measure (frequency) versus an indirect measure (the commonly used, % correct).

Table 1
Importance of Complete Information
(Count and Time)

Oral Reading Performance

ARJUN	Thursday	Friday
Count	300 words correct	200 words correct
Time	3 minutes	1 minute
Count/Minute	100 correct wpm	200 correct wpm

Disruptive Performance

SAMBU	Monday	Tuesday
Count	10 disruptions	8 disruptions
Time	100 minutes	20 minutes
Count/Minute	.1 disruptions /minute (1 disruption every 10 minutes)	.4 disruptions /minute (4 disruptions every 10 minutes)

Table 2
Importance of Direct vs. Indirect Measures
(Frequency vs. % Correct)

Rank & Name	Frequency Score		% Correct Score
	WPM Correct	WPM Incorrect	
131. Doug	223	0	100%
130. Brian	187	1	99%
129. Pat	177	1	99%
128. Julie	176	0	100%
127. Lauri	175	1	99%
126. Gwen	173	2	99%
125. Linda	171	0	100%
124. Pam	170	0	100%
123. Jeff	166	0	100%
122. Mark	160	4	98%

Note: Oral reading scores of top 10 of 131 Standard 7 American students, reading a Standard 7 English literature passage.

In Table 2 the data depicts 10 different scores while the data represent 3 different scores. The frequency measure is 3 times more sensitive than % correct. [Note: Percent (%) correct is the measure commonly used in most school systems throughout the world to score unit tests as well as end of year exams.]

Frequency Based Mastery Criteria

Too often, because of the policy of"content coverage"at each Standard level, we expose students to required skills & concepts but move ahead in the curriculum before many have mastered the material. An important first question regarding potential skills to learn: Which skills should a student master (i.e. commit to memory) versus 'be aware of'butneed not master? In our information age we can easily access information about a knowledge area thus may not need to master the knowledge content.

However, for skills to be mastered, defining a mastery criterion is pivotal to educational decision making. Mastery criterionenable us to decide to stay at a skill level, move ahead or move back.Since frequency (count/time) is our most sensitive performance measure we use performance frequency to define mastery.

Figure 1 provides a summary of the Educational Vital Signs. These are intended to be analogous to the vital signs in medicine (e.g. blood pressure, heart rate, etc). When students are mastering these educational vital sign skills they are generally

Figure 1
Educational Vital Signs *

Skill Area	**Measurement Unit** (performance to count & time)	**Mastery Criterion** (Frequency Based – Count/Time)
1. Listening/Speaking (Social Interaction Dialog)	Hears word •Thinks wordThinks word • Says word (correct/min., incorrect/min.)	250+ - 150 words correct/minute (with only random error)
2. Oral Reading Prose	Sees word Says word (correct/min., incorrect/min.)	250+ - 150 words correct/minute (with only random error)
3. Writing Prose Handwriting	Thinks word Writes word (correct/min., incorrect/min.)	40+ - 30 words correct/minute (with only random error)
Keyboarding	Thinks word Types word (correct/min., incorrect/min.)	minute70+ - 50 words correct/minute (with only random error)
4. Math Computation	Sees problem Writes digit (correct/min., incorrect/min.)	100+ - 80 digits correct/ minute (with only random error)
5. Information Summary (Demonstrating Comprehension) Oral	Thinks fact Writes fact (correct/min., incorrect/min.)	30+ - 20 facts correct/minute (with only random error)
Written	Thinks fact Says fact (correct/min., incorrect/min.)	10+ - 5 facts correct/minute (with only random error)
6. Task Completion	Thinks task Completes task (correct/time, incorrect/time)	100% tasks completed correct/time (with only random error)
7. Creating	Thinks idea Creates item (correct/time, incorrect/time)	100% items created correct/time (with only random error)

Note: * The educational vital signs are analogous to the normal limits in medicine. © 2013 C. M. Starlin

progressing well in school.To get a sense of these mastery criteria, perform each skill for a minute or more (if more than a minute divide your count by minutes performed to get a count/minute) and compare your performance to the vital sign mastery criteria.

There are three elements of mastery – Pace, Accuracy and Rhythm. We use the acronym (PAR) to represent these three elements.The following exercise highlights theseelements of mastery: Write the numerals 0-9 over and over again with yourpreferred (dominant) hand for 1 minute. Now write the 0-9 numerals again for 1 minute but this time useyour non-preferred (non-dominant) hand. Notice the difference in number of numerals written (pace), the legibility of the numerals (accuracy) and the ease or smoothness of performance (rhythm).The frequency (count/time) measure allows us to see all 3 of these elements of mastery rather than just the accuracy element represented by % correct.

Understanding mastery is critical to individualized education since mastery of basic skills supports mastery of desired content knowledge and mastery of content knowledge supports mastery of desired educational outcomes - such as communicating, completing tasks and creating.

The majority of students can achieve mastery, IF placed on an appropriate skill level. However, students of the same age will often not achieve mastery at the same time because of differing developmental levels.

Writing Precise Performance Objecives

The pivotal component of each objective is the mastery criterion. Precise performance objectives are critical to individualizing education. We need to know precisely what skill(s) each student is to learn so we can accurately and reliablymonitor whether the student is in fact learning.

The Writing Precise Performance Objectives (WPPO) sheet depicted in Figure 2 provides a format to guide the objective writing process and includes some completed objectives as examples.

Figure 2
Writing Precise Performance Objectives (WPPO) Sheet

Skill Area/Part	**Skill Description (Sense • promptT Action • count unit)**	**Measurement Conditions** (e.g. setting, material/activity)	**Mastery Criterion** (Correct frequency range)*	**By Date** (m/d/y)
READING (word pro-nunciation)	*Sees • passage T Says • word*	• In level 4 classroom • level 4 reader	250 – 150 correct wpm	4/22/2013
WRITING (expository prose)	Thinks • word T Types • word	• In library• computer • assigned topic	70 – 50 correct wpm	5/2/2013
MATH (computation)	Sees • algebra T Writes • symbol/digit problem	• In level 10 classroom • sheet of 20 algebra problems	100 – 80 correct symbols/ digits/min	6/12/2013
SOCIALSKILLS (greeting others)	Sees • friend T Says • hello	• In all setting throughout the day	100% correct/day	7/28/2013
FOOD RELATED SKILS (following recipe)	Sees • recipe T Performs • step	• At home• Recipe book • Measuring cups & spoons • Pans• Ingredients	100% correct steps/min.	10/15/2013

*** Note:** Mastery criterion are stated in terms of correct/minute performance. Generally, only random error is acceptable for incorrect acceptable for incorrect performance. © 2012 C. M. Starlin

The different sections of the WPPO sheet are discussed below:

Skill Area/Part: This cell provides a place to broadly describe the skill area and sub-parts. (e.g. Reading/word pronunciation), Writing/poetry)

Skill Description: This cell is used to precisely descibe the skill in terms of four elements: (1) the sensory system used (e.g. Sees, Hears), (2) the prompt (e.g. printed Standard 7 passage, basic multiplication problem), (3) the Action (e.g. Says, Writes, Clicks) and (4) the count unit (e.g. word, digit). There are a wide variety of sensory – action channels we might select to individualize for a student. The example below delineates four different skills under the categoy of "spelling."This demonstrates the importance of precisely defining exactly what skill is the focus of instruction.

- Sees word Writes word (See to Write "spelling")
- Hears word Says letters (Hear to Say spelling)

- Hears word Writes letters/word (Hear to Write spelling)
- Thinks word Writes word (Think to Write spelling)

Measurement Conditions: This cell is used to describe the setting and materials or activities used while performing the skill.

Mastery Criterion: This cell indicates the correct frequency (count/minute) range the student must achieve to be considered competent in the skill. Random error, not consistent error, is used as the incorrect performance criterion.

Date: This cell is used to indicate the target date for achieving mastery of the objective.

Short, Frequent Measurements

Learning involves moving from non-mastery to mastery. More technically: Learning is - *the change in the frequency of performance*. Educational assessment around the world tends to focus on summative assessment designed for program accountability. However, teachers need classroom based learning assessments (i.e. formative assessments) to monitor the learning progress of the diversity of students. This is particularly true for struggling students who, like hospital intensive care patients, require frequent monitoring to assure that their intervention programs are effective.

We can obtain adequate data on most skills with short performance samples (e.g. 1, 2, 5 minutes). These performance samples can be collected by the students themselves in some cases, by older or same age peers or by adult helpers. It requires from 5 – 11 days to get a clear picture of learning. (Koenig, 1972) If we collect data on a daily basis we can make needed adjustments in a student's program every couple of weeks. If we collect data once a week it may take a couple months to see a well defined learning picture.

Tables 3 and 4 below present some performance snap shots for twogroups of students.

Table 3
Standard 6 Students Reading English & Malayalam

Standard 6 Story (English)

Rank	Name	Words/Minute correct/errors
1.	Arjun	131 / 0
2.	Sambu	81 / 8
3.	Al-ameen	58/8
4.	Sarath	47/4
5.	Benoj	44/7
6.	Afsal	38/6
Standard 6 Story (Malayalam)		
Rank	Name	Words/Minute correct/errors
1.	Arjun	87/2
2.	Sambu	65/5
3.	Benoj	35/9
4.	Sarath	30/3
5.	Al-ameen	22/0
6.	Afsal	8/8

- Oral reading scores of six Standard 6 students from a Government School In Trivandrum, Kerala, India March, 2013.
- Mastery = 250 – 150 correct wpm with random error

None of the Standard 6 students shown in Table 3 are proficient readers with Standard 6 reading material in either English or Malayalam. They are still learning the skill of reading rather than using the skill of reading as a tool for learning new content.

Arjun who is ranked 1st in English and Malayalam would likely stay at this level as an instructional level. However, the other students will benefit by moving back to easier material in both English and Malayalam to build mastery and then progress back to Standard 6 material.

Table 4 depicts Touch Body Parts data from 23 Standard 1 students in a private school in Nairobi, Kenya. The top two students are close to mastery and with a couple more days of practice will likely achieve mastery. Students ranked 3 to 22 with the exception of student #18 will likely achieve mastery with a couple more weeks of practice. The student ranked #18, due to the high error rate, and the student ranked #23 would benefit from having fewer body parts to identify (e.g. 4-6) until they achieve mastery and then return to the 8 body parts.

Table 4
Standard 1 Students Touching Body Parts

Rank	Parts Identified correct/errors
1.	56/0
2.	56/0
3.	52/0
4.	52/2
5.	50/0
6.	48/0
7.	48/2
8.	46/0
9.	46/0
10.	46/0
11.	46/0
12.	44/0
13.	44/0
14.	44/2
15.	42/0
16.	42/0
17.	40/0
18.	40/8
19.	38/0
20.	36/0
21.	32/0
22.	30/2
23.	22/6

- Skill: Hears body part Touches body part (8 body parts)
- Scores of 23, Standard 1 students.
- Location: Private School In Nairobi, Kenya January 2013.
- Mastery: 80 – 60 correct wpm with random error

Notice that in both the reading and body part data sets the range of scores. These frequency scores consistently have a range of at least x2 and often greater. This highlights the type of performance variation that exists in same age classrooms and why it is important to individualize for each student rather than assume that because students are the same age that they are functioning at the same level.

In order to monitor learning progress we need to collect short, frequent performance samples across a number of days to determine whether correct scores are increasing and error scores are decreasing. An important decision relates to how to summarize learning data. There are three primary ways we summarize data – narrative, tabular or graphic. The adage of "A picture is worth a 1000 words" suggests we often prefer to view information in a graphic (pictorial) form. Only one graphic system currently exists that enables us to view student learning. (See Pennypacker, et. al., 2003).

The above four factors provide the measurement foundation necessary to individualize education. With these factors in place we can proceed to establish those elements that will optimize each student's learning.

Two Critical Components for Student Success

A Significant Other

Emmy Werner (Werner, 1989) conducted a seminal longitudinal study following 698 infants for 30 years. Two hundred and seventy six (276) of the infants

were at-risk due to some adverse developmental circumstances. The most important factor regarding whether these at-risk children survived and thrived was if they had "a significant other" in their life. That is: aperson who loves you unconditionally and advocates for your well being. The most common "significant other" was a family member but the second most likely "significant other" was a teacher.

This study suggests that ensuring that every child has an advocate may be our most important educational intervention. Knowing that at least one person cares for us unconditionally makes schooling and life seem worthwhile.

Werner's work is foundational to the on-going research in the area of resiliency and a focus on student strengths (aka developmental assets) (see Search Institute).

Early Intervention

The explosion of brain research in recent years continues to emphasize the importance of Early Intervention to counteract the influences of impoverished backgrounds and various disabilities. (Neville, 2009) Children who experience enriched early stimulation develop more elaborate brains. Children with more complex brains have larger vocabularies, are more skilled at critical thinking, problem solving and social interaction skills and as a result are better able to handle the demands of the school environment and curriculum. (Hart & Risley, 1995, Jensen, 2005).

Three critical areas of Early Intervention are: (1) provide healthy prenatal and birth to five environments for both mother and child (e.g. skilled medical care, good nutrition, low stress), (2) provide competent and positive social and linguistic adult models and (3) provide massive practice opportunties for the child to emulate the competent and positive social and linquisitic skills.

Organizing a Classroom for Student Learning

Education throughout the world continues to be largely focused on large group instruction of same age peers, exposed to the same content, at the same time. It does not appear that we will move away from same age grouping any time soon largely for social reasons. However, this does not prevent us from ensuring each student is placed at a developmentally appropriate skill level within their same age class.

To move away from a group instruction/lecture model to an individualized focus is a significant shift in educational practice. We need to shift the focus from the teacher performing (lecturing) to the student performing (actively practicing skills). In this model the teacher functions more in a coaching role, providing feedback as students perform rather thanstudents mostly passively listening.

The following four areas are important to address in organizing the learning environment for individualized education: Materials, People, Space and Time.

Organizing Materials

Because students move through the curriculum at different rates it is particularly important to have a variety of curriculum slices for different curriculum units. For example, "must, should and nice to know" concepts and vocabulary. Within the same classroom students may be working on these different levels. If measurement/practice

sheets are developed for these different levels this provides the flexibility to individualize instruction for students functioning at different levels.

Materials can be organized and stored in computer files or filing boxes. With practice, students can learn to interact with the files to access their practice materials. Providing students with individual folders or notebooks gives them a place to keep their materials.

Organizing People

It is helpful to enlist the support of additional persons to improve the student-instructor ratio. The opportunities for recruiting additional people will vary with each school setting. Some of the possible helpers include: same age peers, older peers, community volunteers, teacher aides, administrative staff, support staff, team teachers. It is important to get weekly commitments [day(s) of week and time of day] from classroom helpers to plan for their participation.

Organizing Space

By organizing space in creative ways we can provide more opportunities for accommodating individual learning needs.

Organizing Time

Establishing a *weekly schedule* is helpful in organizing time. If we post the schedule in the classroom this provides a public display that all students and helpers can see.

Establishing routines is helpful in saving time and providing structure for students. For example: "when you enter the classroom pick up your student folder," "do a warm up quiz to start each curricular area (e.g. reading, writing, science) and a wrap up quiz to complete each area."

Establishing classroom rules can save time and support an environment conducive to learning. These rules should also be posted & periodically reviewed. It is best to have from 3 - 5 rules. It is important to state most of the rules in a positive form. For example, Rule 1: Treat each person with respect in both words & actions. Rule 2: If you have a question, raise your hand.

Scheduling biweekly conferences insures that the teacher will have a short time with each student at least once every two weeks to discuss progress, plan individualized practice, validate mastery, etc.

4 Effective Instructional Tactics

The "General Considerations" and "Organizing a Classroom for Student Learning" sections above provide a foundation for effective instruction. The following four instructional tactics are particularly powerful in promoting student learning: (1) determine and maintain the appropriate skill chunk, (2) establish incentives and consequences, (3) demonstrate desired performance, and (4) practice. These tactics are elaborated in the remainder of this section.

Determine & Maintain Appropriate Skill Chunk.

The goal of skill level placement is to ensure that each student is learning at an optimal level, although the amount of content different students learn, may be dramatically different. We might have three same age students in a math class working at the following skill levels: writing numerals 0 - 9, computing +, -math facts 0 – 18, and computing long division problems.The goal is to have each studentplaced at a developmentally appropriate skill level yet achieving equivalent learning.

If we do a good job of maintaining a student at an appropriate skill level (chunk) the need for elaborate instruction is less because there is less new content to master and fewer error responses to correct.

Establish Incentives and Consequences.

We can create incentives in a number of ways:

- engage a student's interest (e.g. motivate a student to read by allowing them to read in an interest area);
- connect the skill to relevance outside of school (e.g. learning to type enables the student to communicate with current technology);
- tie a desired consequence to improvement (e.g. If you increase the number of correct words read Then you will earn 5 minutes of free time.)

When selecting consequences to motivate students it is preferable to use *intrinsic consequences* rather than *extrinsic consequences*. Intrinsic consequencesare more likely to sustain students outside of school. Examples of *intrinsic consequences*:

- improvement in performance shown on a graph;
- student functions at a higher level due to mastery of lower level skills;
- student can apply skill in the real world.

However, there are situations where *extrinsic* consequences may be needed for some period of time.Examples of *extrinsic consequences*:

- ashort auditory signal (e.g. tap, click) that indicates a correct response; (see TAG teaching)
- praise;
- tokens (e.g. points, chips, stickers);
- playing a game;
- food.

Demonstrate Desired Performance.

If we do a good job of skill level placement and students are motivated to learn because of established incentives and consequences then demonstrating the desired performance often enables the student to perform the desired skill without elaborate verbal instructions. One process that can be helpful is the "My turn, our turn, your turn" model (Archer, 2010). In this model the instructor demonstrates (my turn), the student and instructor perform the skill together (our turn), then the student performs the skill independently (your turn).

The quote below provides support for the power of demonstration as an effective instructional tactic:

".....neuro-scientists have found that when a person watches someone else perform a task with the intention of later replicating the observed performance, motor areas of the brain are activated in a fashion similar to that which accompanies actual movement." (Frey & Gerry, 2006)

Practice

Some suggest that practice (repetition) is a law of learning. (Thorndike, 1932) You can ask young children the question: "How do you get good at something?" and they already know the answer – PRACTICE. Professionals such as: musicians, performing artists, athletes, skilled craftspeople and skilled trades people understand the importance of practice to the development of competent performance.

However, largely due to the policy of requiring exposure to a designated amount of content at each Standard level, many students do not get enough practice on new skills and concepts before they are required to move on to new content.

A good rule of thumb is to create classroom environments where students are practicing 80% of the time. If we assess our current % of student practice time, we can use this as a baseline as we strive to increase the amount of practice time. Consideration of the following areas is helpful in moving toward more classroom practice time:

- number of opportunities to respond during each practice session. (e.g. 10/ minute vs. 50/minute);
- number of practice sessions per day;
- number of practice sessions per week.

Below are elaborated - Eight (8) good practices when practicing:

1. Free to Respond vs. Constrained Practice. We are best informed when we consistently view each student's optimal performance. Thus we want them to respond freely without constraints. We recommend developing materials in a performance sheet format. This format generally provides the maximum opportunity for the student to respond as opposed to formats that may pace the student (e.g. flash cards, computers) or that have fewer opportunities to respond (e.g. workbook pages).

2. Direct Practice. Too often we provide practice activities related to an outcome skill (e.g. matching pictures and words in a workbook) with the hope that the related activity will transfer to performing the outcome skill (e.g. reading words in books). It is critical to provide direct practice on the exact outcome skill to build competent performance in the skill.

3. Timed Practice. As mentioned above pace and rhythm are an important part of mastery. Consequently, it is important to provide practice in building efficient, smooth performance which is accomplished by practicing in a timed format. However, it is not a focus on "go as fast you can" but rather to develop the pace and rhythm of performance.

4. Massive Practice. Evidence suggests that to achieve an expert level of performance requires 10,000 hours of practice. (Ericsson et. al, 2006) This works out to be hours of daily practice over a 7 – 10 year period. Think of some skills in which you have invested that much practice time. (e.g. walking, speaking, reading). The skills we wish students to master will also require such massive practice.

5. Short, Frequent Practice. Short, frequent practice (e.g. 10, one minute practice sessions/day; 5 days a week) is more effective than extended, infrequent practice (e.g. 1 hour, once a week). (Aitken, 2010)

6. Repeated Practice. It is sometimes helpful to let a student practice the same skill chunk over and over on the same day as well as across a number of days. Many students do not know what it feels like (motor memory) to perform a skill at a proficient level. Through repeated practice they can experience mastery for the first time which gives them self-confidence as well as the motor memory of what it feelslike to be competent in the skill.

7. Varied Practice. Some students maintain their motivation to practice if the practice process is varied.(CAUTION: Not all students desire variety.) Below are some ways to vary practice:

- Practice in a variety of Channels
- Practice using a variety of Timings
- Practice in a variety of Formats
- Practice in a variety of Settings
- Practice with a variety of People

8. Application Practice. To ensure that desired skills have functional utility it is important to support practice in real world settings. Below is a sequence we might follow in helping a student learn how to use money.

Practice in isolation
(e.g. money denominations on practice sheet)
↓
Practice in composite
(e.g. money word problems)
↓
Practice in school simulation
(e.g. use money in school store)
↓
Practice in real world
(e.g. use money during field trip to grocery store)

The integration of the four instructional tactics (skill level placement, incentives/ consequences, demonstration and practice) increases the probability that each student will learn at an optimal level and learn the skills needed to be a functional and contributing citizen.

Summary

Our goal as educators is to supportlearning for all students. Our current school systems serve a few students well but many students poorly. As ability, linguistic, ethnic and social-economic diversity increases we face more challenges.

Educational systems around the world have systemic obstacles to individualized education. Some of these impediments and the changes that are needed are summarized below:

1	One Size Fits All (Students of the same age, must learn the same content, same time.)	Unique Program for Each Learner (developmentally appropriate skill level.)
2	Exposure to All Syllabus Content for	Mastery of Only Critical Skills & Concepts
3	Grading Tied to % Correct Scoring - Translated to Letter Grades (Any grade below an "A" indicates lack of mastery)	Mastery Defined as Pace Accuracy + Rhythm (No letter grades)
4	Benchmark Exams Tied to One Size Fits All Syllabus	Validate Mastery (Once student achieves mastery level performance)
5	Summative Benchmark Exams	Formative Short, Frequent Measurements (to enable frequent program adjustments)
6	Large Group, Lecture Focused Instruction	Individual, Coaching Focused Instruction
7	Diploma = Same for Everyone	Diploma = Different for Everyone

This article outlined some changes in practice thataddress many of these systemic issues. To design schools and classrooms to better accommodate student's individual needs is a substantial undertaking – a true paradigm shift. However, if we maintain our current system the system will continue to be stressed, as will many of the students.The

consequence of not making this shift is that large numbers of students do not achieve their potential and become a burden to society in the form of crime, health care needs and unemployment.

The challenge of Individualized Education can not be more daunting than sending a person to the moon. Humankind made it to the moon, we are certainly capable of achieving individualized education and thereby creating- OPTIMAL LEARNING FOR ALL STUDENTS.

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DISABILITY AND FARMING IN INDIA: ROLE OF HIGHER EDUCATION

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Abstract

The concept of disability is very complex in nature, and there are historical, medical, social, legal and philosophical influences on its interpretation. An individual with impairment may not be able to find work not because of his or her inability to work per se, but as a result of inaccessibility of work places or discrimination (Mitra and Sambamoorthi, 2006). The United Nations estimated that more than 1.3 billion people live in abject poverty in the global South, 600 million of which are disabled (Yeo, 2005). There is no clear statistics of people with disabilities engaged in the agriculture sector in India, where in roughly, 700 million (70%) of India's 1 billion people depend on the agricultural sector for their livelihoods (Coleman, 2003).

This paper deals with the role of higher education in extension programmes, issues before the universities and the objectives to tackle the emerging problems of disabled farmers. Also, the linkage of research and extension is highlighted by focusing on some important factors like: viewing research and extension as an integrated knowledge and technology system, Strengthening crucial linkages under a pluralistic approach/system, empowering disabled farmers' groups for more demand- and farmer- driven research and extension services, human resource development including gender empowerment, disability management and entrepreneurship development among the farming community and policy changes for building effective extension strategy etc.

Further, it also focuses on the need for interdisciplinary/multidisciplinary orientation programmes among different departments such as Agricultural Science, Sciences, Social Science, Human Development like Education and Women Studies, Management, Technology and Engineering, Medicine and Rehabilitation for addressing the problems of disabled farmers in a holistic way for their empowerment. It also advocates the establishment of Centre for Disability Studies and Rehabilitation Science at each and every university to address the issues of empowerment and documentation of people with disabilities. Finally it deals with the agricultural education, extension and training (AEET) needs of the disabled farmers by highlighting its objectives and the role of universities in these extension/training programmes. While addressing this, the author also discusses about agricultural innovation systems and emphasizes on the active participation of disabled farmers, researchers, extension officers, technocrats, social psychologists, policymakers, private-sector companies, entrepreneurs, agro processors, nongovernmental agencies, and other intermediary organizations in bringing about desired changes in the lives of the farmers with disabilities through innovations and assistive technologies.

*Finally, the author concludes with some valuable **Recommendations** for **Policy Planning** for the welfare of the farmers in the form of their involvement, active participation independence and their empowerment.*

Keywords: *Farming, Disability, Disability Statistics, Extension Programmes, etc.*

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Meaning of Disability

The concept of disability is very complex in nature, and there are historical, medical, social, legal and philosophical influences on its interpretation. Disability is usually conceptualized as being multi-dimensional for the person involved. There may be effects on organs or body parts, for instance impairments in the mobility of joints or bones. There may be effects on certain activities, for instance lifting or gripping objects with the hand. There may be effects on a person's participation in a full community life; for instance, environmental modification or equipment may be needed so that the person is enabled to work in their usual employment etc.

Any study on disability has to deal with the challenges of defining and measuring disability because different conceptual models have been developed to define disability. In the medical model, disability is considered to be a problem of the individual that is directly caused by a disease, an injury or other health conditions, and that requires medical care in the form of treatment and rehabilitation. An individual with any impairment is considered disabled, irrespective of whether the person experiences limitations in his or her life activities due to the impairment, where impairment is the term used for an individual's condition (e.g. deaf, blind). In contrast, the social model considers disability purely as a social construct. Disability is not the attribute of an individual; rather it is created by the social environment and requires social change. An individual with impairment may not be able to find work not because of his or her inability to work per se, but as a result of inaccessibility of work places or discrimination (Mitra and Sambamoorthi, 2006).

In India, the broad definitions of different categories of disabilities have been adopted in the Persons with Disabilities Act, 1995 (Equal Opportunities, Protection of Rights and Full Participation) as well as under the Rehabilitation Council of India Act, 1992. "Person with Disability" means a person suffering from not less than forty percent of any disability certified by a medical authority.

Disability Statistics

According to the World Health Organization (WHO, 1999) estimates, 10% of the world's population is disabled and this figure is increasing through population growth, medical advances and ageing process. The World Bank further projects that 20% of the poorest sections of the society are people with disabilities. Thus if taken broadly, anywhere between 10 and 20 % of any population has some or the other disability. Recent estimates suggest that 85-90% of the global population of persons with disabilities resides in so-called developing countries. The United Nations estimated that more than 1.3 billion people live in abject poverty in the global South, 600 million of which are disabled (Yeo, 2005). Thus, the majority of people with disabilities in the South are not only poor, but they are among the poorest of the poor.

In India, there are no clear estimates of the number of persons with disabilities. Concerns persist that, given the stigma surrounding disability, many individuals with severe impairments, mainly women and rural disabled, are excluded from census and surveys (Jeffery & Singal, 2008). The magnitude of disability is not very clear. Estimates vary due to differing definitions of disability and questions over the reliability of the Sample Surveys and national Census.

The 2001 Census projects only 1.9% of Indian population as affected by disability. The Working Group on Empowering the Disabled for the 11th Five-Year Plan, 2007-12 (constituted by Planning Commission, Government of India) regards 10 % as more realistic figure for planning purposes. The local surveys in different parts of India estimate that around 15% to 20 % of the Indian population is disabled in some form or the other (Reddy, 2004). The most commonly accepted figure is 5% to 6 % (70 million people) giving India largest number of people with disabilities in the world, equivalent to population of the UK. Whatever the figure, the reality is that the people with disabilities represent a significant proportion of India's population and any planning should take into account in the developmental issues of this massive population (Reddy and Poornima, 2010). With this background, it is painful to note that there is no clear statistics of people with disabilities engaged in the agriculture sector in India, where in roughly, 700 million (70%) of India's 1 billion people depend on the agricultural sector for their livelihoods (Coleman, 2003).

Barriers of Disabled Farmers in Extension Programmes

Agriculture and rural development programs in India have done a commendable service especially in terms of food production, income and employment generation and reduction of poverty. Still miles have to be covered for sustainable agricultural and rural development. The current development scenario are changes in the rural institutions, enabling the disabled farmers to lead independent life, globalization and liberalization, revolution in information technology and electronic media, growing importance of NGOs in agriculture, role of private agencies, women concerned development paradigm, diversification and value addition, management-based development, etc. Even then, Affordability, admission requirements, and physical distance from training centers, literacy, language of instruction and scant resources, socio-cultural barriers, economic barriers, institutional barriers**,** technological and environmental or infrastructure barriers are some of the barriers faced by the disabled farmers while involving themselves in agriculture extension programmes. Lack of access to information is another major barrier facing many of the rural, underprivileged and disabled farmers. Proper practice of agriculture is usually supported by conducive environmental and physical conditions. Adverse conditions like climate, soils, infrastructure and other support systems hamper the development of good agricultural practice. Electricity, water, roads, health facilities and other crucial inputs are needed in agriculture. Government needs to ensure these facilities are provided so that disabled farmers are able to learn about and practice proper agriculture.

Role of Higher Education in Extension Programmes

The concept of agriculture extension programmes at present are not confined to extending services to the extension workers and colleges but also to the farmers in the villages, particularly the disabled farmers, keeping in mind the needs of the entire rural community. Any extension program must be based on the expertise of the institution, utilization of local infrastructure facilities and exploitation of manpower resources to meet the requirements of the community demands. Any extension program by the

university must concentrate on the disadvantaged population such as women, disabled farmers, unemployed youth, people below the poverty line, apart from semi-skilled and skilled farmers to upgrade their knowledge, information and skills which result in better production of goods and services. The focus is in making the people effective participation in development process (Reddy and Poornima, 2007).

Higher education in general, and professional and technical education in particular', plays a vital role in the economic and social development of a country. It provides a wide range of increasingly sophisticated and ever changing variety of trained manpower needed in education, engineering, medicine, agriculture, management, communication, etc. It produces researchers, who through their activities, deepen and extend frontiers of scientific and technical knowledge leading to innovations, which energize engines of economic growth and development. Apart from developing human resources, higher education turns out thinkers who reflect on critical problems that affect humanity and thereby ensure its survival and growth. Thus the single most important indicator of national future can be said to be the state of this higher education. There can be no denying to the fact that changes in higher education scenario in India are utterly fast, changes are phenomenal and changes continue to be inevitable (Anu Singh, and Puja, 2011).

Issues before the Universities

The higher education dealing with agriculture has a daunting task to deal with, keeping in mind the needs and necessities of the farmers with disabilities. To identify some of them are:

- Lack of assistive technologies needed for the disabled farmers at an affordable cost.
- Poor infrastructure (limited space for training and research) and equipment that do not allow a conducive environment for innovative research and training.
- Under utilization of the potential extension capacity available at universities through internship, field training and field attachment.
- Under utilization of research capacity in universities.
- Universities conducting research which does not address the disabilities of the farmers.
- Not tapping into the wealth of intellect in the universities.
- Limited support to universities in producing the right human resources.
- Overlapping of extension functions between the national and local governments.
- Lack of mechanism for regular communication between research and extension agencies.
- Weak partnership with disabled farmers, NGOs and the private sector for service delivery.
- Failure to recognize research and extension as closely interdependent activities.
- Lack of efficient and effective strategies to strengthen the linkage(s) between research and extension.
- Lack of awareness and appreciation of existing useful technologies.

To overcome these issues, the universities has to promote and highlight the programmes for the welfare of the disabled farmers along with the marginalized and small farmers, women and children engaged in the agricultural activities etc.

Objectives of Extension Programmes of the Universities

Some of the objectives of the universities while outlining the extension programmes for the disabled farmers in rural India are:

1. Generation of knowledge, information and skills and passing on the same to the target population i.e. disabled farmers.
2. Documentation and dissemination of healthy practices in terms of training and development so as to replicate the same in other parts of the country.
3. Sensitization of disabled farmers for the effective participation in the government developmental programs.
4. To provide training to enhance the skills of the disabled farmers based on their physical abilities.
5. To understand the problems of the disabled farmers and find out appropriate solutions through research and innovations.
6. To provide better self-employment opportunities by utilizing the government support services.
7. To train the differently abled farmers for sustainable development in the community.
8. To develop liaison between government departments and the farmers with disabilities.
9. To develop innovative, adaptive and proactive human resources for agriculture, agro-industry and rural development.
10. To engage with rural communities, particularly the disabled farmers to promote agricultural innovations and entrepreneurship.

On the whole the universities extension activity should start with identification of needs of the disabled farmers to the development of appropriate training methodologies, approaches, imparting training to the personal and actual target group, generation of employment opportunities for better marketing facilities and making the disabled farmers as active partners than passive spectators in the developmental programs.

Linkage of Research and Extension Programmes

India's agricultural research system is one of the largest systems in the world. The National Agricultural Research System (NARS), which is at the forefront to guide technological breakthroughs in agriculture, was strengthened with the establishment of the ICAR in 1929. The SAUs, which came into being as autonomous institutions during 1960s, also became a part of NARS. The NARS led by the ICAR has four national level institutions (deemed to be university), 45 ICAR institutes, 30 national research centers, four Bureaus, 10 project directorates, 84 All India Coordinated Research Projects and 16 other projects/ programs in the public sector. Apart from this, there are 31 SAUs and one Central Agricultural University. This NARS system not only generates technologies and develops human resources, but is also involved in technology assessment, refinement and dissemination. There are about 103 million farm families spread over 127 agro-climatic zones of the country with a variety of crop and animal production systems. The ultimate purpose of extension system is to provide useful and timely technological information to the farmers and feedback the field problems to the research

system. There is an alarming knowledge-practice gap in agriculture. The reasons for low adoption of technologies are (Baldeo Singh, 2002, as cited in Rita Sharma, 2003):

- Poor linkages among research, extension and client systems i.e. disabled farmers;
- Lack of economically viable, operationally feasible and socially compatible technologies;
- Poor technological knowledge of disabled farmers and extension personnel; and
- Poor infrastructure and marketing facilities.

Research and extension play important role in the enhancement of agricultural productivity. Research, on one hand, generates improved technologies and practices that help to raise crop yields and incomes, particularly of disabled and small farmers. Extension, on the other hand, provides the mechanism by which those technologies and practices are disseminated for adoption by disabled farmers. For the technology transfer process to be successful, however, these two vital support services need to be effectively linked. Neither research nor extension can fulfill its responsibilities without the other: hence good communication, strong interaction and effective collaboration are primary requisites. The strategies and mix of mechanisms employed depend on the policy, institutional, and resource context of the country. In this regard, some of the important factors are:

- Viewing research and extension as an integrated knowledge and technology system,
- Focusing on research and extension functions, rather than simply on organizational structures, to broaden dialogues among all stakeholders,
- Strengthening crucial linkages under a pluralistic approach/system,
- Promoting informal networking at many levels with an incentive system for improving linkages,
- Empowering disabled farmers' groups for more demand- and farmer- driven research and extension services,
- Technological options for the benefit of disabled farmers and agricultural production,
- Location-specific and need-based extension, participatory extension for technology development and dissemination among farmers with disabilities,
- Linkages and coordination among development departments and organizations,
- Use of new communication channels and media support for dissemination of information and latest innovations in technology for assisting the disabled farmers,
- Human resources development including gender empowerment, disability management and entrepreneurship development among the farming community,
- Cost-sharing of extension services and privatization of extension,
- Policy changes for building effective extension strategy,
- Control, accountability and sustainability in agriculture,
- Developing a comprehensive National Agricultural Policy,
- Addressing the educational and technological needs of target groups i.e. disabled farmers,

- Improving communication support in extension services,
- Strengthening extension management and strategy building,
- Promotion of extension programmes through agribusiness/Agri-clinic centers,
- Strengthening extension system through national research center for agricultural extension,
- Use of distance education in dissemination of farm technologies related to disabled farmers, and
- Promotion of computer-aided extension.

When research and extension institutions are organized and function in an integrated systems approach, even when physically separate, then linkages among them and with disabled farmers are more likely to receive attention. An integrated approach to research and extension attempts to link all system participants – researchers, extension workers, input suppliers, disabled farmers and others – so that they are jointly involved in the agricultural technology innovation process. The common denominator among these participants is information and knowledge; when linked, they form an agricultural knowledge and information system that draws on both modern science and the disabled farmers' indigenous knowledge. With the focus now shifted to demand-driven, location-specific, customized and tailor-made technologies and services to serve different categories of farmers, a vital link in the integration process, missing from the earlier dispensation, namely, the disabled farmer' needs to be included in the integration process. Evolving new agricultural technology and its quick dissemination requires a series of integrated and communicating linked systems among the agencies concerned. This involves three sub-systems:

- A research system, responsible for generating and evolving new agricultural technology and innovations to meet the needs of the disabled farmers;
- A linking (extension) system responsible for transfer of new technology, facilitating its adoption and also reporting back field problems faced by the disabled farmers to the research system (feedback); and
- The client system (disabled farmers), the ultimate users of technology.

It is necessary to understand the nature of linkages and communication patterns between and within the three systems, and their roles in speedy transfer of technology. This understanding, unfortunately, is poor and currently inadequate, resulting in distortion and loss of messages in the transfer process.

Higher Education Programmes related to Farmers with Disabilities

The universities have to discharge adequately their responsibilities to the entire educational system and society as a whole. Extension is one of the responsibilities of higher education institutions along with major research and teaching dimensions. This is an extremely significant dimension as universities have more social responsibility.

Higher agricultural education institutions are expected to play a leading role in the agricultural and training programmes for disabled farmers from the grass root level to the national level. Maalouf (1988) asserts that these institutions should be an integral part of higher educational

institution programmes and the research themes should include interests of disabled farmers and poor agricultural producers and measurement of research impacts. Lindley et al. (1996) identified a need for greater educational relevance and higher quality graduates. Post-graduate training should provide high-level scientists and researchers to pursue academic careers in agricultural and work towards the causes of disabled farmers. Higher Agricultural education institutions should develop education programmes and curricula responding to the need of socio-economic development of the disabled farmers by providing the knowledge and skills required to meet the needs of the people concerned. Furthermore, curricula and programmes should solve societal, technical and socio-economic challenges. The different academic disciplines at university level can contribute significantly in their own way for empowerment people with disabilities.

i) Agricultural Sciences should aim at developing the following competencies: investigate and analyze sustainable agricultural practices, indigenous agricultural knowledge, and interrelated issues in agriculture to benefit the disabled farmers. Thus, the competencies should be developed within the context of the following knowledge areas: soil science, plant science, animal science, agricultural economics, basic chemistry, basic biological concepts, sustainable natural resource utilization, management of the environment and the abilities requisite for farmers with disabilities. In addition to these competencies, Agricultural Sciences should also address social and economic justice issues such as, community development, risk management, food security and physical capabilities of the farmers.

ii) The Faculty of Science can organize Community Science club in villages. In organizing this, the disabled farmers must be encouraged and it should be participatory in nature. Innovative information which will have direct bearing on the life of the disabled farmers can be discussed and demonstrated. In these science clubs, the members of the club can be trained to develop skills based on their physical abilities, which may improve their living conditions. These clubs can be used as potential centers for integrating the extension programs and functional training in various fields of science. These are problem of potable water, soil analysis, modern agricultural methods, identification of adulterations of food, biogas technology, horticulture, animal husbandry, sericulture, poultry etc.

iii) The Faculty of Social Science can be of utmost benefit for farmers with disabilities as they can impart value oriented socio cultural and equality based concept which in turn boost their self confidence. It can also generate the 'we' feeling among disabled as well as normal farmers by creating healthy and positive atmosphere in the villages there by removing the biased feeling among them. It highlights the benefits of sharing and helping each other through their work culture.

iv) Human Resource Development like Education and Women Studies can play a dominant role in the extension work of the universities. They can impart knowledge and skills to the disabled farmers about their living conditions, socio-economic development, citizenship training, and gender sensitivity and so on for better quality of life. It can also facilitate good inter relationship between the disabled farmers and their counterparts to cooperate with one another and lead harmonious life without any prejudices.

v) The Faculty of Management can improve the lifestyles of the disabled farmers by giving better management practices to the community people in their day-to-day life. They can provide knowledge related to water management, banking awareness, available bank facilities consumer awareness, consumer protection and so on. The **Faculty of Physical Education** can give information & training in yoga, rural sports and stress management. A separate Rural Sports Club for disabled farmers can also be organized by utilizing the community education center and other infrastructural facilities in the community.

Likewise, the **Department/Faculty of Engineering/Technology** can propagate the concepts like smokeless choolas, renewable energy from the waste (Community bio-gas plant), use of solar energy for cooking and other daily use, vermin culture for generating nutrient rich fertilizers, soil conservation, judicious use of fertilizers and pesticides, occupational hazards and ways and means of protective measure and so on. Also, the assistive technologies needed for the disabled farmers must be developed at an affordable cost and made available to the disabled farmers making them self reliant and independent.

Similarly, other departments in the Universities like Biotechnology, Geology, Home Science and Computer Science etc can extend their knowledge to the disabled farmers through appropriate ways and means. As the country is transforming rapidly towards modernization, the occupations or vocations of the people are also changing. As such, the universities should tune their extension activities accordingly to generate better employment opportunities for the disabled farmers based on their limitations.

Finally, there is a need for establishment of **Centre for Disability Studies and Rehabilitation Science** at each and every university to address the issues related to the people with disabilities. Also, there is a need for **documentation** about the people with disabilities in general, people with disabilities in farming sector in particular as there is a lack of data available on the disabled people engaged in the agriculture farming. All these departments should work together instead of working as separate compartments so as bring effective changes in assimilation and dissemination of knowledge, skills and technical assistance to meet the needs of disabled people in all sectors there by enabling and empowering them to participate in the mainstream society with confidence along with their fellow beings. As there is a need for bringing structural changes to ensure barrier free environment for disabled persons, **interdisciplinary / multidisciplinary orientation** is essential in addressing the issues by linking every department within the universities and other universities along with the governmental and non-governmental organizations. With regard to the disabled farmers, it is not only the responsibility of agriculture universities in bringing out the required changes, but also the duty of all other universities to work together hand in hand for the betterment of the disabled farmers in agriculture in particular, and other sectors in general.

Agricultural Education, Extension and Training (AEET)

Agricultural extension is an educational process which has its goal to help the rural disabled farmers to build a better life by conveying the useful and needed information at appropriate time. It is essential for agricultural development. It

plays a major part in technology transfer to the rural areas. Agricultural extension is a branch of agriculture which assists the farmers to bring about continuous improvement in their physical, economic and social well being through individual and cooperative efforts. In other words, it helps in the development of an disabled farmer and the village community as a whole. It makes available to the farming community the scientific and technical information, training and guidance to solve the problems in agriculture including animal husbandry, gardening, horticulture, sericulture, agricultural engineering etc. Agricultural extension helps the disabled farmers to help themselves and to raise the standard of their living. Thus, the goal of extension process is to enable people to use the skills, knowledge and information to improve their quality of life.

Agricultural universities help build sustainable extension systems through training and extension service support like:

- **Specialized courses** emphasizing practical communication strategies, extension philosophies, mass media approaches, and other extension tools, such as new information technologies for the disabled farmers.
- **Agricultural curricula** in which extension strategies, experience, and approaches permeate all courses, relating course materials to technology dissemination and needs of the disabled farmers.
- **An appreciation of farming as a business**, including elements of business planning and market information systems.
- **New approaches to extension**, including user-financed advisory services, community based participatory extension, group extension, and product and service marketing.
- **Technical fields and priorities** of increased importance to extension for disabled farmers, such as natural resources management, farm management, commercial crops, postharvest handling, and high-value export crops.
- **Extension program management training**, either in the regular student curriculum or as a special course at institutions that conduct extension.

The extension programme should have both community development and extension programmes in it. As a community development programme, it should help in the development of village communities and as an extension programme, it should develop channels between information centers to carry all types of scientific and technical information to the farmers with disabilities in the villages. The disabled farmers should be brought to a stage where they can accept the new ideas and adopt the new technologies. The extension workers should bring changes in the skills, attitudes, knowledge and behavior of disabled farmers. Regardless of their economic and social conditions, these people have to be taught to overcome the external forces and make progress. Internal changes in the knowledge, desires and capacities of these farmers lead to the changed ways of doing things for their own improvement. Besides, disabled farmers should be encouraged to express their needs and should not be ignored. The participation comes only when they are interested in the proposed extension programme. This interest should be created by the extension worker explaining about the extension programmes, its advantages if he adopts new technology.

The mission of Agricultural Education, Extension and Training (AEET) should be working towards improved, relevant, and effective teaching, research and extension for the benefit of the disabled farmers. Therefore improving human capital in agriculture is especially important where the shortage of trained human resources is a major limiting factor to development (Lindley et al., 1996). Some of the research studies suggest that many agricultural education curricula have shortcomings as they are unresponsive to socio-economic, technological, physical and environmental changes in the rural sector and are inappropriate for the local and present context. Furthermore, many curricula for both formal and non-formal AEET do not involve any form of systematic training needs, analysis and often adopt delivery modes and mechanisms that fail to suit the reality of the physical abilities of people in the farming sector. This situation extends to many countries throughout the world, including India (Wallace et al., 1996). Generally the improvement of a country's human resource capacity for productivity is a prerequisite for social, economic and technological development. Thus both formal and non-formal education is essential for improving agricultural and rural development, particularly for the disabled farmers. Considering that the AEET strategy outlines the mechanisms for addressing identified disparities in education provision and access to opportunities, an analysis of agricultural education and training barriers is essential. The output of the analysis would enhance removal of barriers to equitable access and meaningful participation in agricultural development, particularly the disadvantaged groups, women and people with physical disabilities. Thus, the objectives of AEET are:

- To develop and maintain an effective and well-coordinated AEET that is integrated at all levels and respond appropriately to needs of the disabled farmers.
- To enhance equitable access and meaningful participation in AEET curricula with urgent challenges facing the disabled farmers.
- To develop and recommend a systematic plan to identify, prioritize and remove access barriers to AEET.
- To improve and promote the image of agriculture as a career and livelihood choice, particularly among children and the youth.
- To encourage post-graduate studies in Agricultural Sciences in order to produce highly qualified scientists who add value to the agricultural science knowledge base and
- To ensure that AEET is accredited at all levels with an adequate number of appropriately qualified educators and trainers. An effective quality assurance system of AEET will be applied at all levels.
- To develop and recommend a framework for interventions by the different Agricultural Education and Training providers, offering formal education (from primary school to tertiary level education), and those offering non-formal education at community level. It is expected that this situation would improve access to AEET over time.

Agricultural Education, Extension and Training (AEET) plays an important role in preparing farmers, researchers, educators, extension staff, and members of Agri-businesses and others to make productive contributions towards the upliftment of the

disabled farmers. However, one of the critical issues in the 21st century is the changes and adaptations required in AEET in order for it to effectively contribute to improved food security, sustainable Agricultural production, viable Agri-businesses and rural development while keeping in mind the physical abilities of the farmers. Generally, there are many complex factors that influence sustainable Agricultural and rural development.

Extension is important to universities as a discipline within their curricula and as a link to real-world agricultural concerns. University extension activities include advising extension staff and/or farmers, training extension workers, providing student internships, preparing extension booklets and materials, and conducting research on extension needs and methodologies. Potential university roles in extension include:

- Accepting full responsibility for national or provincial extension (uncommon, because it requires a substantial extension service attached to the university).
- Collaborating with government extension services to provide technical and training support and to make staff available as extension agents or subject matter specialists.
- Providing extension services in a particular area or for special extension programs (a role that provides a "laboratory" for university field work).
- Contracting extension services using the university's technical base to competitive advantage.

Universities need to improve management functions, including program monitoring and evaluation; broaden curricula; develop multidisciplinary approaches; and expand international networks for exchanging information on university operations. Universities must adapt to a changing environment for agricultural sector institutions, addressing several key questions regarding the expanded roles they must play in national research and extension systems. Agricultural universities in developing countries must increasingly assume responsibility for higher degree training. Sustainable, cost-effective technology systems will therefore depend on the capacity of agricultural universities to train needed staff.

Training of Extension Personnel

Extension personnel are the major resources of a successful extension service. The extension workers should be motivated first to create a feeling of belonging to the organization. Love for the profession and they should be true to their duties. Extension workers who enter the extension service should be prepared to perform basic extension tasks. In addition, a successful extension organization makes provision to further strengthen the professional and technical competencies of its staff members once on-the-job because staff must be trained up to date to provide the essential link in the technology transfer process between agricultural research and the disabled farmers. So, pre-service training enlightening various topics on subject matter like agriculture, animal husbandry, extension service organization, programme development process, problem identification, communication strategies, evaluation techniques etc. should be given to the extension personnel.

Training is one of the most important methods of imparting knowledge and skill

to extension workers and disabled farmers concerning new farm technology, and helps speed up dissemination. Training, therefore, should be an important function and integral part of research institute and agricultural university activities. These training programmes should-

a) Plan, organize and conduct production- and problem-oriented training programmes of short and long duration for extension workers and disabled farmers. Short-duration training programmes, e.g., on specific crops or technology, should be organized before the start of the crop season. These programmes should be practical in nature and the trainees should be provided with the opportunity of 'learning by doing.'

b) Institutes should also organize training programmes, synchronizing with field operations and highlighting key points, to keep subject-matter specialists and field extension workers up to date on the latest farm technology.

c) Long-term training programmes should also be organized periodically for subject-matter specialists and other senior extension staff so that they may go through all the operations from sowing to harvesting of a crop and find the practical problems faced by the disabled farmers in dealing with these activities.

d) Special and need-based training programmes for disabled farmers, farm youths and farm women should be organized on-campus and also in the field or villages by mobile teams.

e) Institutes and agricultural universities should also organize training programmes for other agencies, such as input suppliers and credit and other agencies, in order to educate them about the nature, characteristics, potential and agricultural requirements of the disabled farmers.

f) Training should be a regular activity of research institutes and agricultural universities, and there should be a separate unit for this purpose, supported by core technical staff and other training facilities, including teaching and audiovisual aids, transport, hostels, etc.

g) The training programmes should be planned in advance and made known to all concerned. Each training programme should clearly state its objectives, technical content (syllabus) and methodology, and should be orientated to the training needs and professional level of the trainees.

h) The training programmes should emphasize not only subject-matter content but also extension methodology and understanding the characteristics and behavior of the disabled farmers.

The challenges now facing Indian agriculture are more daunting in research as well as extension and training systems. The systems are not adequately geared up to meet the future requirements. With the old approaches still to make way for new ones, symptoms of complacency and loss of definite directions are becoming apparent. Although the main function of research institutes and universities is the generation of improved farm technology and innovation, at the same time they can play many important roles in the transfer of new technology to disabled farmers. These activities and programmes should be

considered as legitimate functions of research institutes and agricultural universities, and not treated as an additional burden.

Agricultural Innovation Systems

Agricultural innovation systems are a paradigm in which information dissemination need not be performed only by extension workers. The conventional pipeline approach to agricultural research and technology development and dissemination, whereby research is performed by researchers and the results are turned over to extension staff for dissemination to farmers, has produced numerous success stories, but it has serious limitations for broad-based, sustained agricultural growth and poverty reduction. It has failed to reach many of the actors i.e. the disabled farmers who need information to improve their productivity and production, achieve food security, and create wealth. Increasingly, the innovation systems approach is seen as a viable alternative to the pipeline approach. The entry of new actors, demographic pressures, and a value-chain approach to agriculture and market forces, combined with new economic pressures and new insights into socio cultural realities and human behavior, created the need and opportunity for more interactive approaches. The innovation systems approach is seen as a useful paradigm for this interaction.

An innovation systems approach considers innovation as a systemic process and recognizes that innovation can emerge from many sources, complex interactions, and knowledge flows. Clark, Smith, and Hirvonen (2007) defined an innovation system as a network of agents whose interactions determine the innovative impact of knowledge interventions, including those associated with scientific research. The World Bank (2007) defines an innovation system as "a network of organizations focused on bringing new products, new processes, and new forms of organization into social and economic use, together with the institutions and policies that affect their behavior and performance."

A great deal of knowledge already exists that can be used to improve the livelihood of the disabled farmers. The innovation systems approach represents an effective way to use, adopt, or commercialize existing knowledge. The innovation systems approach moves away from a traditional linear research and development model in which research is completed and results are passed on to users i.e. the disabled farmers through extension. Instead, it emphasizes the need to nurture the demand for knowledge and technologies among a range of actors, including disabled farmers, researchers, extension officers, technocrats, policymakers, private-sector companies, entrepreneurs, agro processors, nongovernmental agencies, and other intermediary organizations, and to encourage them to demand relevant knowledge. The flow of knowledge between these actors is important in enabling innovations to work for the betterment of the disabled farmers and to advance food and agriculture.

University research and extension policies and structures must foster strong links to major stakeholders. Through participation in extension and research programs and on advisory committees and governing boards, disabled farmers and other stakeholders can provide vital client input. Client financing for research and extension is even more important to ensure that

programs respond to client needs. University-owned research corporations might be established, to obtain financing and manage some research programs independently of university regulations (Claire, 2010).

As the population is growing year by year, there is a need to regenerating our agricultural sector. In many parts of the country, the agrarian society is suffering with draught or floods. There is so much migration from rural to urban seeking for employment but ultimately falling into urban poverty sticken conditions. To accelerate the agricultural productivity there is a need for second Green revolution. The allied agriculture activities like forestry, fishing, poultry, and diary must be geared up. Here once again the Universities should play a vital role in sensitizing the Agrarian Society in terms of modern & scientific methods of farming and irrigation such as rain-fed crops, multi crop cultivations, water conservation mechanism, and effective utilization of available water, use of green manures, appropriate use of pesticides and labour intensive techniques of farming and so on.

By virtue of their knowledge and exposure to the globalization, the Universities should tune the agricultural communities in and around them about the demands of the global market and accordingly equip them the ways and means of better quality production, preservation & marketing of agricultural and allied goods and services. Once again the universities have larger role to play in terms of sensitization, attitudinal building, development of skills and competencies in public about the ways and means of sustainable development without environmental degradation (Reddy et al., 2008).

Policy Planning

1. There needs to be adequate safety education materials (including both printed and audiovisual resources) on machinery, tractors, and livestock handling, for use in hazard prevention and preventing injuries following a disability. The high quality task specific safety education materials should focus on hazard identification, injury prevention techniques, and disability specific hazards.
2. Information on the potential risks of farming with a disability should be distributed to rural rehabilitation professionals and major rehabilitation facilities for use in preparing farmers following a disability to safety return to their operation if they so desire.
3. Even though the incidence rate of injury to other individuals assisting a farmer with a physical disability is low, there appears to be a high potential for injury, especially to children. Resources need to be developed to help and educate individuals with physical disabilities to become aware of the hazards to care givers and assistants.
4. A concerted effort is recommended to monitor the injury experience of this population in order to identify and address unique hazards that could result in additional or secondary injuries (Phillip et al., 1995).
5. There is no choice but to move towards a farmer-driven, farmer-accountable research extension system that is demand-driven rather than supply-driven. The disabled farmer should be the center of all research and extension activities.

6. The decentralization of research and extension networks to provincial and further down to district/municipal level, keeping in mind the needs of the disabled farmer.
7. In the scenario of economic liberalization and globalization, there is need to promote a multi-agency extension system drawing upon the resources and strength of the private sector. Yet at the same time strengthening the public sector to meet the requirements of those disabled farming community not served by a competitive private sector. There is also a need for partnership between public and private sector.
8. At all decision-making levels, both research and extension representatives must be involved. A planning process, which involves participatory rural appraisal (PRA) exercise, should be conducted by both research and extension workers. Joint review and finalization of the plan is likely to bring about greater integration.
9. Government should play the role of enabler, facilitator and coordinator and retain monitoring and evaluation function.
10. There is a need to reexamine the current agricultural extension approaches in India to understand where information gaps exist and determine why farmers are not accessing information through the large, well-established public-sector extension system in addition to emerging private and third-sector actors.

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ACADEMIC STRESS IN SCHEDULED CASTE ADOLESCENT BOYS

Dr. A. Kusuma*

Abstract

Adolescence is generally regarded as a period of great stress and strain. Stress is the body's general response to any intense, physical, emotional or mental demand placed on it by oneself and others. Academic stress place an important role in the child's life and it accounts for variation in performance, achievement or success. The present study emphasize to assess the academic stress in Scheduled Caste adolescent boys and also to study the effect of their age, ordinal position, income of the family and education level of parents on academic stress. A sample of 50 Scheduled Caste adolescent boys (14 and15 years) studying 9th standard were selected by simple random sampling from the hostel of Jawaharlal Nehru High School, Tirupati, Chittoor (dt), A.P. Interview Schedule and Academic Stress Scale were administered to the sample and data were collected. Suitable statistical techniques were employed and presented the results.

Key Words: *Academic Stress, Adolescents, Scheduled Caste, Performance, Achievement, etc.*

Introduction

Adolescence is the most impressionable period of human life and it is a period of transition between childhood to adulthood. As the child enters adolescence there are marked changes both in its physical and mental life. It comes approximately in between the years 12 to 18.

Adolescence is an important development stage as it has both immediate and long term effects on attitude and behavior. It is also a time when physical and psychological maturation growth in psycho-social and psycho-sexual spheres of life that are marked by accomplishment of three specific tasks namely surrender of childhood dependence on parents, identity formation with respect to sexual, intellectual and moral dimensions and definition of career goals, profession, vocation, personal life style, choices and intra family relationships and integrating the experiences.

Rice (1992) stated that "Adolescence has traditionally been viewed as beginning with the onset of puberty, a rapid spurt in physical growth accompanied by sexual maturation, and as ending when individuals assume the responsibilities associated with adult life marriage entry into the work force and so on"

Mobey and Sorensen (1995) defined "Adolescence is the period of human development, during which a young person must move from dependency to independence, autonomy and maturity. The young person moves from being part of family group to being part of a peer group and to standing alone as adults".

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Some of the important development tasks of adolescents are as follows:

- Acceptance of changed body and physique
- Achieving and satisfying and socially accepted masculine or feminine role
- Location oneself as member of one's own generations by developing more mature relations with only age mates
- Achieving emotional independence of parents and other adults
- Selecting and preparing for an occupation and economic independence
- Preparing for marriage and family life
- Establishing one's identity as a socially response personality

Characteristics of Adolescence stage are:

- Adolescence is an important period
- Adolescence is transitional period
- Adolescence is a problem age
- Adolescence is a time of search identity
- Adolescence is a dreaded age
- Adolescence is a time of unrealism
- Adolescence is a threshold of adulthood

Adolescence is generally regarded as a period of great stress and strain. Stress is the body's general response to any intense, physical, emotional or mental demand placed on it by oneself and others.

Whiten (1983) defines stress as any circumstances that threaten or perceived to be threaten a well being and there by tax our adaptive capacities. He further felt that stress may be either physical or psychological or both overlapping and/or interesting.

Student life coincides with adolescence and stress can manifest in children as a reaction to the changes in life in addition to academic pressures. Children become more self-aware and self-conscious, and their thinking becomes more critical and complex. At the same time, children often lack in academic motivation and performance, as their attention is divided among a lot many things, especially creating an identity for themselves.

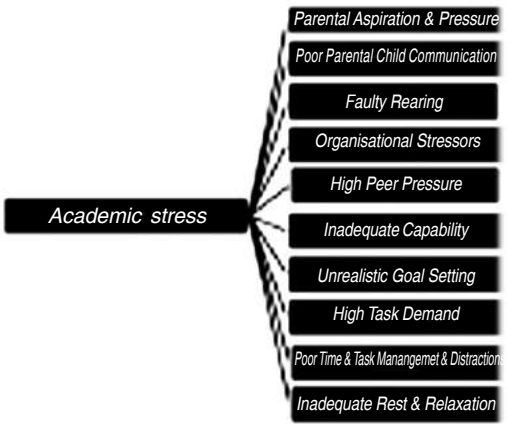
Causes of Stress in Students

- Stress is created by parental pressure to perform and to stand out among other children. When they can't rise up to that expectation or during the process of meeting it, children may suffer from frustration, physical stress, aggression, undesirable complexes, and depression.
- Students, who are under performers, develop negative traits such as shyness, unfriendliness, jealousy and may retreat into their own world.
- Over scheduling a student's life can put them under stress. A child's in school and after school activities should be carefully arranged to give them some breathing space. Parents may want him to learn music, painting or be outstanding in a particular sport. So many things are crammed into their schedule, unmindful (often) of the children's choices and capabilities that it puts a lot of mental pressure on them in an effort to fulfill their parents wishes.
- School system cram students with a tremendous amount of home work, which they usually have to complete spending their evenings, weekends and most of the vocations. Unable to find enough time of their own,

students often lose interest in studies and under perform. They often feel stress by being asked to do too much in too little a time.

- Teenage depression or growing up tensions add to the academic pressure. If unable to adapt to the transition and change, students often carry enormous amount of anxiety, negative personal traits and can suffer from massive attention problems.
- When "effortless" learning does not take place these students lose confidence, motivation and interest and this creates more stress.

ACADEMIC STRESS CAUSATIVE MODAL



Stress is a physical and psychological reaction to issues and events emanating from one's environment. Perceived obstacles to goal achievement, environmental change, life challenges and periods of significant transition are common stress triggers for students. All of us experiences stress on a regular basis. Most of these stresses actually play a positive role in motivating us. However, like most things in excess, too much stress is negative.

Following are the warning signs of symptoms of stress.

- **Physical symptoms**

Changes in sleep patterns, changes in eating patterns, more frequent headaches than is normal for you, recurring colds and minor illness, frequent muscle ache and/or tightness, colds or other illnesses, high blood pressure, indigestion, fatigue, ulcers and more disorganized than is normal for you.

- **Emotional symptoms**

Shorter temper than is normal for you, a greater sense of persistent time pressure, increased generalized frustration and anger, depression, anger, fear of anxiety, feeling overwhelmed and mood swings.

- **Cognitive symptoms**

Forgetfulness, unwanted or repetitive thoughts, difficulty in concentrating and increased difficulty in task completion.

Despite the fact that education is universally given a high priority the academic institutions today don't show a motivation atmosphere. Students are often subjected to various stress related tests, examination, home work (in the form of punishment), teachers (biased attitude, inefficient), peer groups (self-oriented) etc. The major challenges of children are poor retention and recall, lack of appreciation from their parents (loses motivation), school environment, personal anxieties, fear of teachers, exam phobia, perceptual insecurity, conflicting expectations from the parents and the society, the growing competition, fear of failure or success and parental attitudes.

Academic stress is inevitable in any education institution. In optimal limits it mobilizes the potentialities of the students to perform more effectively. However increasing amount of academic stress for

prolonged periods may create over – whelming frustration and anxiety in the students which may in turn adversely affect their physical and mental health, morale, academic achievement, study habits and adjustment styles.

Academic stress plays an important role in the child's life and it accounts for variation in performance, achievement or success (Vivekananda Kendra Yoga Research Foundation, 1999)

OBJECTIVES

1. To assess the academic stress in Scheduled Caste adolescent boys.
2. To study the effect of age, ordinal position, income of the family, and education level of parents on academic stress in Scheduled Caste adolescent boys.

Method

A sample of 50 Scheduled Caste adolescent boys (14 and 15 years) studying 9th standard were selected by simple random sampling from the hostel of Jawaharlal Nehru High School, Tirupati, Chittoor (Dt) A.P.

The Scheduled Castes (SCs), also known as the Dalit, and the Scheduled Tribes (STs) are two grouping of historically disadvantaged people that are given express recognition in the Constitution of India. During the period of British rule in the Indian sub-continent they were known as the depressed classes. According to 2001 census the Scheduled Caste population was 16.23 per cent of the total population of India.

Interview Schedule was prepared with items on general information of the subjects. The Academic Stress Scale was developed by Kim (1970). It is a self reporting five point rating scale with a total of 40 items. It has been developed to identify the sources of academic stress among students. This scale was adapted to Indian conditions by Rajendran and Kaliappan (1990) and the reliability was 0.082.

Interview Schedule and Academic Stress Scale by Kim (1970) were administered during pilot study and modifications were made. Then the tools were used to collect data from the final sample. Suitable statistical techniques like percentages and $\div^2$ test were employed to analyze the data.

RESULTS

General Information

Age is a steadily changing condition, individuals are strongly influenced by the age norms. Among the total number (50) of subjects 68.0 per cent of adolescent boys are from 14 years age group and 32.0 per cent of them are from 15 years of age.

In the Indian context gender plays a vital role in the growth and development of the children. The gender is a definite, highly visible biological fact which appears at birth and remains fixed for all. Universally all individuals are divided into two permanent classes male and female. Fifty Scheduled Caste adolescent boys are selected for the study.

According to tradition, the ordinal position of the person in his family, the order of his birth in relation to his siblings have marked influence on his personality. Thirty four per cent of adolescent boys are first born, 46.0 per cent are second born and 20.0 per cent boys are third born.

Parental Occupation place a basic role in the development of the children, occupations provide livelihood, which gives a source to procure all the essential

commodities. With regard to occupation of fathers of adolescent boys, 28 per cent of them are farmers 28.0 per cent are workers and 44.0 per cent of them are involved in business. With respect to occupation of mothers, higher percentage (72.0) of them are housewives, 20.0 per cent of mothers are workers and the remaining 8.0 per cent of mothers are in business.

Income has to do with amount of money people receive or what people get or earn. Income depends upon the type of occupation of the parents does respectively. A majority (42.0%) of the subjects families belong to the income level ranging between 25000-40000 per annum, 30 per cent of them belong to the income level ranging between upto 25000 per annum and 28.0 per cent of them belong to the income level ranging between above 40000/- per annum.

Education is essential as it develops the facilities of a person, acquaints him/her with the world and satisfies the need of the intellectual development. Sixty six per cent of the fathers and 80.0 per cent of the mothers have up to 5th class, Fathers (26.0%) and 14.0 per cent of mothers have 5th to 10th class education. Fathers (8.0%) and 6.0 per cent of the mothers have intermediate and above.

Traditionally family is viewed as a multifunction unit central to the stability and continuity of human society. The present trend of family system is the nuclear type. The higher percentage (80.0%) of Scheduled Caste adolescent boys are from nuclear type families and the remaining 20.0 per cent from joint families.

Sixty per cent of adolescent boys are from rural area and the remaining 40 per cent of adolescent boys are from urban area. A majority of the subjects are from Hindu religion.

Previous exams marks percentage will show effect on academic performance. More than half of the percentage (58.0%) of the boys are from first class and 42.0 per cent of them are from second class.

Stress Level

Stress is a concept that has been linked to various aspects and operations. For some it is stimulus, sometimes more, sometimes less complex, for others it is an inferred inner state and for still others it is an observable response to stimulus or situation.

Stress is the boy's general response to any intense physical, emotional or mental placed on it by oneself or others. Racing to meet a deadline, dealing with a difficult person, or earning poor grade are all stressful experiences.

Table – 1

Level of Academic Stress in Scheduled Caste Adolescent Boys

Level of stress	No. of boys	Per cent
Low stress	12	24.0
Moderate stress	25	50.0
High stress	13	26.0
Total	50	100.0

The stress levels divided into three categories. The first category indicates the low stress which in the 20-40 per cent, moderate stress is in the 40-80 per cent and high stress is in the 80-120 per cent.

The table-1 describes the levels of academic stress in Scheduled Caste adolescent boys. Half of the percentage (50%) of boys have moderate stress, 26.0 per cent of adolescent boys are in high stress and the remaining 24.0 per cent of boys are in low stress.

Table – 2
Association between Level of Academic Stress in Scheduled Caste Adolescent Boys and Their Age

Age	Level of academic stress			Total	$\div^2$ value
	Low stress	Moderate stress	High stress		
14 years	7	20	7	34	3.367 (df = 2)
	20.63%	58.8%	20.63%	100%	
15 years	5	5	6	21	
	31.3%	31.3%	37.4%	100%	

P-value=0.186

The table-2 reveals the association between academic stress in Scheduled Caste adolescent boys and their age. The boys of 14 years age group of 7 members (20.63%) have low stress, 20 members (58.63%) have moderate stress and the remaining 7 members (20.63%) have high stress. The boys of 15 years age group of 5 members (31.3%) have low stress, 5 members (31.3%) have moderate stress and the rest of the 6 members (37.4%) have high stress.

In 14 years age group more than half of the percentage of boys have moderate academic stress level. In 15 years age group the percentage of boys are slightly higher in high academic stress level.

The stress levels will very as the age differs from each one. As the persons gets matured he/she is able to know the present world and what are the aspects that are now in demand. As the age group progress they want to be independent in their stress levels.

The $\div^2$ value (3.367) reveals that there is significant association between academic stress in adolescent boys and their age.

Subramanian (2001) revealed that there is no relationship present and perceived academics of 13 years of age, higher secondary students among boys and girls.

Table - 3
Association between Level of Academic Stress in Scheduled Caste Adolescent boys and Their Ordinal Position

Ordinal position	Level of academic stress			$\div^2$-value
	Low stress	Moderate stress	High stress	
First born	5	7	5	3.367 (df = 4)
	29.4%	41.2%	29.4%	
Second born	6	11	6	
	26.1%	47.8%‘	26.1%	
Third born	1	7	2	
	10.0%	70.0%	20.0%	

P-value=0.669

The table-3 indicates the association between academic stress in Scheduled Caste adolescent boys and their ordinal position. First born children 5 boys (29.4%) have low level of stress, 7 boys (41.2%) have moderate level of stress and 5 boys (29.4%) have high level of stress. Second born children 6 boys (26.1%) have low level of stress, 11 boys (47.8%) have moderate level of stress and 6 boys (26.1%) have high level of stress. Third born children 1 boy (10.0%) has low level of stress, 7 boys (70.0%) have moderate level of stress and 2 boys (20.0%) have high level of stress.

The $\div^2$ value (3.367) reveals that there is significant association between academic stress in adolescent boys and their ordinal position.

Table - 4
Association between Level of Academic Stress in Scheduled Caste Adolescent boys and their Income of the Family

Income of the family (Rs)	Level of academic stress			$\div^2$-value
	Low stress	Moderate stress	High stress	
Up to 25,000	4	11	-	8.367 (df = 4)
	26.7%	73.3%	-	
25,000 to 40,000	5	9	7	
	23.8%	42.9%	33.3%	
Above 40,000	3	5	6	
	21.4%	35.7%	42.9%	

P-value=0.079

The table-4 reveals the association between academic stress in Scheduled Caste adolescent boys and their Income of the family. Up to Rs.25, 000 income level, 4 children (26.7%) have low level of stress, 11 boys (73.3%) have moderate level of stress. Rs.25,000 to 40,000 income level, 5 boys (23.8%) have low level of stress, 9 boys (42.9%) have moderate level of stress and remaining 7 boys(33.3%) have high level of stress. Above Rs. 40,000 income level, 3 boys (21.4%) have low level of stress, 5 boys (35.7%) have moderate level of stress and the rest of 6 boys (42.9%) have high level stress.

$\div^2$ value (8.367) reveals that there is significant association between academic stress in adolescent boys and their ordinal position.

Table - 5
Association between Level of Academic Stress in Scheduled Caste Adolescent boys and Their Fathers Education Level

Fathers education Level	Level of academic stress			$\div^2$-value
	Low stress	Moderate stress	High stress	
Up to 5th class	9	17	7	6.130 (df = 4)
	27.3%	51.5%	21.2%	
5th to 10th class	1	6	6	
	7.7%	46.2%	46.2%	
Intermediate and above	2	2	-	
	50.0%	50.0%	-	

P-value=0.190

The table-5 shows the association between academic stress in Scheduled Caste adolescent boys and their fathers education. Nine boys (27.3%) have low level of stress, 17 boys (51.5%) have moderate level of stress, and the remaining 7 boys (21.2%) have high level of stress in up to 5th class education level of fathers group. In 5th to 10th class education level of fathers group, 1 boy (7.7%) have low level of stress, 6 boys (46.2%) have moderate level of stress, and the rest of 6 boys (46.2%) have high level of stress. In intermediate and above education level of fathers group 2 boys (50.0%) have low level of stress and 2 boys (50.0%) have moderate level of stress.

$\div^2$ value (6.130) reveals that there is significant association between academic stress in adolescent boys and their fathers education level.

Table - 6
Association between Level of Academic Stress in Scheduled Caste Adolescent boys and Their Mothers Education Level

Mothers education Level	Level of academic stress			$\div^2$-value
	Low stress	Moderate stress	High stress	
Up to 5th class	11	21	8	4.715 (df = 4)
	27.5%	52.5%	20.0%	
5th to 10th class	1	3	3	
	14.3%	42.9%	42.9%	
Intermediate and above	-	1	2	
	-	33.03%	66.7%	

P-value=0.318

The table-6 indicates the association between academic stress in Scheduled Caste adolescent boys and their mothers education level. Eleven boys (27.5%) have low level of stress and 21 boys (52.5%) have moderate level of stress and 8 boys (20.0%) have high level of stress in up to 5th class education level of mothers group. One boy (14.3%)

have low level of stress, 3 boys (42.9%) have moderate level of stress and the remaining 3 boys (42.9%) have high level of stress in 5th to 10th class education level of mothers group. In intermediate and above education level of mothers group, one boy (33.3%) have moderate level of stress and 2 boys (66.7%) have high level of stress. In up to 5th class education level of mothers group, more than half of percentage of boys have moderate stress.

$\div^2$ value (4.715) reveals that there is significant association between academic stress in adolescent boys and their mothers education level.

CONCLUSIONS

- At present society the academic stress is seen in adolescents because of competition in every field.
- Protection, love, affection and understanding from parents and teachers are very important to reduce the academic stress and improve the coping with stress in adolescent boys.
- Proper interactions and communication is necessary between adolescent boys and parents to facilitate expressions of various experiences and opinions for better understanding for happy and healthy living.
- The parents, teachers and administrators should focus on major attention and new ventures not only to improve academic performance of these children but also development of their personality.
- School should be provided opportunities, resources and encouragement for successful achievement.
- Healthy and congenial school environment is necessary to reduce the academic stress.
- To reduce the stress in adolescents, intervention programs are necessary.
- To reduce the academic stress in adolescent boys / girls yoga, meditation and physical exercises are required.
- Guidance and counseling services are needed for adolescents to make them to plan and prepare for academic and career.

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EDUCATION AND ECONOMIC STATUS OF PEOPLE IN IDUKKI DISTRICT OF KERALA STATE

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Abstract

Economics of Education is one of the developing branches of Economics. A good number of research studies have been carried out to analyse the economic value of education. The present investigation is to assess the contribution of education to the economic status of people in an educationally backward, but educationally advanced district of Idukki. The sample for the study consisted of 2254 earning members selected from the district. Statistical techniques such as test of significance of the difference between mean and analysis of variance were employed for the analysis of data. The data are collected using a questionnaire. The study revealed that education has a significant role to play in determining the economic status of people, irrespective of locality, gender and occupation. The study also revealed that there exists considerable difference in the economic status of people with the same level of education.

Key Words: *Economic Status, Education, Earning, Gender, Locality, etc.*

Introduction

Education is the supreme form of wealth and is the fulcrum of every kind of development. It is the process of human enrichment for the achievement of higher and better quality of life. It transforms the raw human beings into human resources, other wise known as human capital and prepares them to be capable of utilizing the resources economically. It is a means of social improvement and material well being, especially for the economically and socially backward people. It provides them the capacity of acquiring new skills and develops in them the right attitude to wealth, savings and work.

Need for the Study

In India considerable progress has been achieved in terms of literacy, school enrolment, network of schools and spread of higher education institutions including technical and professional education. Expenditure on education, both governmental and parental is on the increase. But this rise in expenditures is justifiable, if it provides higher productivity in terms of higher earnings and security to households.

Many economists believe that there exists a positive relationship between education and earnings of individuals irrespective of the sector of employment. But there exists alternate views among economists and educationists regarding the contribution of education to earnings. This broken relationship demands further investigation. Also the influence of the factors like locality, gender and occupation also require special attention.

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Attempts were made by scholars at the macro and micro levels to analyse the realation between education and economic growth. These studies are not feasible to give a comprehensive view on the relationship between these variables. The attempt of the investigator is to present a true picture on the impact of education on the economic well-being of people using cross sectional primary data.

Contextual background of the Problem

In Kerala, there is considerable inter-district disparity in the educational development. This is significant in spite of the efforts made by government and other agencies. Compared to other districts, Idukki experiences a varied status with respect to education and economic growth. Though it is educationally backward, in general, it maintains a high economic status.

The indicators of educational and economic growth show that educationally advanced districts are economically advanced and vice versa, with a few exceptions. Considering the indicators, Idukki is at the top in economic field, but in education, it is lagging far behind. Taking one major indicator, each of education (literacy) and economic growth (per capita income) Idukki ranks thirteenth and first respectively among the fourteen districts of Kerala. Hence, the investigator found appropriate to focus attention on this district with the twin phases of education and economic growth.

Idukki district has certain peculiar, climatic and demographic features. The agricultural sector dominates the other sectors. Agriculture depends much on climatic factors, available of labour, fertility of soil, irrigation, availability of seeds and manure and finance. The district is rich in spices cultivation, tea, coffee, vegitables, fruits, and also rubber. These crops, no doubt, are the main stream of the the district income. But they are dependent on climatic factors and the sudden ebb and flow of price rates in the market.

When confronted by adverse situations either climatically or financially, the people of Idukki find that they can no more depend entirely on cultivation. They are in distress to find a proper solution to the problem or get financial assistance from their friends since every farmer like them is in financial crisis. In these circumstances a probe into the influence of education on the economic life of people in Idukki is of utmost importance.

Sicne agriculture is the major source of income of most of the households in Idukki, it has a direct bearing on the living conditions, which determine the economic welfare of households. Fluctuations in the agricultural sector lead to changes in other economic activities. They include; changes in consumption, expenditure, production, distribution, saving and investment, variation in prices, wages, occupation, supply and demand for commodities and so on. In this context, it is important to examine the role of education in the economic status of people in Idukki district.

Objectives of the Study

1. To find out the influence of education on the economic status of people having different level of education the total sample and sub samples based on locality, gender and occupation.
2. To find out whether there exists any significant difference between the economic status of people having the same level of education in the sub samples based on locality, gender and occupation.

Methodology of Study

The present investigation is aimed to study the role of education in determining the economic status of people. Hence to investigator adopted Normative Survey method for the study. The independent variable selected for the study is the level of education attained by the people. The dependent variable is the economic status of people. Economic status denotes the average monthly earnings of individual members from all sources. The sample for the present study consisted of 2254 individuals from 1500 households selected by stratified random sampling technique from Idukki District. The data required for the study please collected using a questionnaire. The important statistical techniques employed for the analysis of data are, Test of significance of the difference between means (t-test), and Analysis of Variance (ANOVA)

Procedure of the Study

The sample individuals were divided into Four categories according to their level of education. They are (School Educated (E1), Certificate Holders (E2), Degree/ Diploma holders (E3), Post Graduates and above (E4). The mean economic status of each of these categories were computed for the total sample and for the sub-sample based on Locality (Rural, Urban); Gender (Male, Female) and Occupation (Agriculturists, Businessmen, Daily Wage Earners, Monthly Wage Earners). Difference in the economic status people having different level of education and having same level education are analysed in detail.

Analysis and Interpretation

A comparison of economic status revealed through the mean earnings of different Educational categories (E_1, E_2, E_3, E_4) of people is made for the total sample and for the sub samples. Then the difference in the mean earnings of same Educational Category of people in the sub samples based on Locality, Gender and Occupation.

1. Earnings of different educational categories of people in the total sample

Total sum of squares, mean sum of squares and F ratio for the mean earnings of the four Educational categories of people in the total sample is presented in table 1.

Table 1
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories in the Total Sample

Source	Sum of Squares	df	Mean Square	F
Between Groups	14202468985.88	3	4734156328.62	243.85**
Within Groups	43681330996.36	2250		
Total	57883799982.25	2253	19413924.88	

** Significant at 0.01 level

From the table it is observed that the value of F statistic is 243.85, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of people belonging to different Educational categories in the total sample. The Duncan's Test shows that:

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (5668) category is significantly higher than that of E_1 (3568) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9017) category is significantly higher than that of E_1 (3568) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (9791)

category is significantly higher than that of E_1 (3568) category.

4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (9017) category is significantly higher than that of E_2 (5668) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (9791) category is significantly higher than that of E_2 (5668) category.
6. There is significant difference between the earnings of E_3 and E_4 categories. The earning of E_4 (9791) category is significantly higher than that of E_3 (9017) category.

2. Locality Groups

a) Earnings of different Educational Categories

The difference in the mean earnings of the four Educational categories of people in the Rural and Urban sub-samples have been presented below.

I. Urban People

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the Urban sub sample were computed. The data and results are given in table 2.

Table 2
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories Based on Locality - Urban

Source	Sum of Squares	df	Mean Square	F
Between Groups	3105924545.97	3	1035308181.99	45.91**
Within Groups	10823156301.13	480	22548242.29	
Total	13929080847.10	483		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 45.91, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of Urban people belonging to different Educational categories.

To find out which Educational categories differ significantly in their earnings in the Urban sub sample, Duncan's Test is used and the results are given below.

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (6459) category is significantly higher than that of E_1 (4057) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9590) category is significantly higher than that of E_1 (4057) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (1054) category is significantly higher than that of E_1 (4057) category.
4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (9590) category is significantly higher than that of E_2 (6459) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (1054) category is significantly higher than that of E_2 (6459) category.
6. There is no significant difference between the earnings of E_3 and E_4 categories.

II. Rural People

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of

people belonging to Rural areas given in the table 3.

Table 3
Summary of Analysis Of Variance (ANOVA) of Mean Earnings of Different Educational Categories Based on Locality - Rural

Source	Sum of Squares	df	Mean Square	F
Between Groups	9767079407.12	3	3255693135.70	176.47**
Within Groups	32580546841.45	1766	18448780.77	
Total	42347626248.58	1769		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 176.47, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of Rural people belonging to different Educational categories. Duncan's Test shows that:

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (5404) category is significantly higher than that of E_1 (3497) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (8778) category is significantly higher than that of E_1 (3497) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (9359) category is significantly higher than that of E_1 (3497) category.
4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (8778) category is significantly higher than that of E_2 (5404) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (9359) category is significantly higher than that of E_2 (5404) category.
6. There is no significant difference between the earnings of E_3 and E_4 categories.

b) Earnings of Same Educational Category – Locality Groups

The differences between the mean earnings of same Educational Category of people belonging to Urban and Rural areas are given in table 4.

Table 4
Data and Results of Test of Significance of the Difference between Mean Earnings of Each Educational Category of People based on Locality

Educational Category	Sub sample	No.	Mean	S.D	t value
E_1	Urban	130	4058	2880	1.81*
	Rural	906	3497	3364	
E_2	Urban	116	6459	3764	2.6**
	Rural	348	5404	3788	
E_3	Urban	156	9590	5818	1.39*
	Rural	374	8778	6252	
E_4	Urban	82	10541	5961	1.69*
	Rural	142	9359	4440	

*Not Significant at 0.05 level ** Significant at 0.01 level

The following inferences were drawn from the table.

1. There is no significant difference between the earnings of people in the Urban and Rural areas in E_1 (CR = 1.81; P > 0.05), E_3 (CR = 1.39; P > 0.05) and E_4 (CR = 1.69; P > 0.05) Educational categories.
2. There is significant difference between the earnings of E_2 Educational Category in the Urban and Rural sub samples (CR = 2.6;

P < 0.01). Urban (6459) people earn significantly higher than that of Rural (5404) people.

3. Gender Groups

a) Earnings of Different Educational Categories

The difference in the mean earnings of the four Educational categories of people in the Male and Female sub-samples are given below:

I. Male

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the male sub sample are given below in table 5.

Table 5
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Gender – Male

Source	Sum of Squares	df	Mean Square	F
Between Groups	10377289226.10	3	3459096408.70	185.06**
Within Groups	31962305137.95	1710	18691406.51	
Total	42339594364.06	1713		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 185.06, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of males belonging to different Educational categories. Duncan's Test shows that:

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (5521) category is significantly higher than that of E_1 (3780) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9444) category is significantly higher than that of E_1 (3780) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (10246) category is significantly higher than that of E_1 (3780) category.
4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (9444) category is significantly higher than that of E_2 (5521) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (10246) category is significantly higher than that of E_2 (5521) category.
6. There is significant difference between the earnings of E_3 and E_4 categories. The earning of E_4 (10246) category is significantly higher than that of E_3 (9444) category.

II. Female

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of females are given in table 6.

Table 6
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Gender - Female

Source	Sum of Squares	df	Mean Square	F
Between Groups	4004888310.61	3	1334962770.20	64.24**
Within Groups	11138591022.72	536	20780953.40	
Total	15143479333.33	539		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 64.24 that is highly significant (0.01 level). It can be concluded

that there is significant difference in the earnings of females belonging to different Educational categories. Duncan's Test shows that :

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (6177) category is significantly higher than that of E_1 (2006) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (8367) category is significantly higher than that of E_1 (2006) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (9249) category is significantly higher than that of E_1 (2006) category.
4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (8367) category is significantly higher than that of E_2 (6177) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (9249) category is significantly higher than that of E_2 (6177) category.
6. There is no significant difference between the earnings of E_3 and E_4 categories.

b) Earnings of Same Educational Category - Gender Groups

The difference in the mean earnings of same Educational Category of people in the Male–Female sub-samples are given in table 7.

Table 7
Data and Results of Test of Significance of the Difference between Mean Earnings of Educational Categories Based on Gender

Educational Category	Sub sample	No.	Mean	S.D	t value
E_1	Male	912	3780	3402	5.68***
	Female	124	2006	1932	
E_2	Male	360	5521	3886	1.55*
	Female	104	6177	3481	
E_3	Male	320	9444	6582	1.98**
	Female	210	8367	5327	
E_4	Male	122	10246	4239	1.47*
	Female	102	9249	5887	

* Not Significant at 0.05 level ** Significant at 0.05 level
***Significant at 0.01 level

The following inferences were drawn from the table:

1. There is significant difference (0.01 level) between the earnings of Males and Females in the E_1 (CR = 5.68; P < 0.01) even Educational category. Males (3780) is significantly higher than that of Females (2006).
2. There is significant difference (0.05 level) between the earnings of Males and Females in the E_3 (CR = 1.98; P < 0.05) Educational Category. Males (9444) is significantly higher than that of Females (8367).
3. There is no significant difference between the earnings of Males and Females in the E_2 (CR = 1.55; P > 0.05) and E_4 (CR = 1.47; P > 0.05) Educational Categories.

3. Occupational Groups

a) Earnings of Different Educational Categories

The difference in the mean earnings of the four Educational categories in the Agriculturalists, Businessmen, Daily Wage Earners and Monthly Wage Earners sub-samples are summarised as follows:

I. Agriculturists

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of agriculturists were computed. The data and results are given in table 8.

Table 8
Summary of Analysis of Variance (ANOVA) Of Mean Earnings of E_4 Educational Category Based on Occupation – Agriculturists

Source	Sum of Squares	df	Mean Square	F
Between Groups	48262109.47	3	16087369.82	1.39*
Within Groups	5668253744.18	488	11615274.06	
Total	5716515853.65	491		

*Not Significant at 0.05 level

From table it is obvious that the value of the F statistic is 1.39, which is not significant. It can be concluded that there is no significant difference in the earnings of Agriculturists belonging to different Educational categories.

II. Businessmen

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of Businessmen are given in table 9.

Table 9
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Occupation – Businessmen

Source	Sum of Squares	df	Mean Square	F
Between Groups	740940748.92	3	246980249.64	7.05***
Within Groups	7285139439.75	208	35024708.84	
Total	8026080188.67	211		

*** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 7.05 which is significant (0.01 level). It can be concluded that there is significant difference in the earnings of Businessmen belonging to different Educational categories. Duncan's Test shows that :

1. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9956) category is significantly higher than that of E_1 (5936) category.
2. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (12500) category is significantly higher than that of E_1 (5936) category.
3. There is significant difference between the earnings of E_4 and E_2 categories. The earning of E_4 (12500) category is significantly higher than that of E_2 (6672) category.
4. There is no significant difference between the earnings of E_1 and E_2, E3 and E_2 and between E_3 and E_4 categories.

III. Daily Wage Earners

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the Daily Wage Earners sub sample were computed. The data and results are given in table 10.

Table 10
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Occupation - Daily Wage Earners

Source	Sum of Squares	df	Mean Square	F
Between Groups	778823119.16	3	259607706.38	45.91***
Within Groups	5336683722.94	566	9428769.82	
Total	6115506842.10	569		

*** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 45.91, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of Daily Wage Earners belonging to different Educational categories. Duncan's Test shows that :

1. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9250) category is significantly higher than that of E_1 (3047) category.
2. There is significant difference between the earnings of E_3 and E_2 categories. The earning of E_3 (9250) category is significantly higher than that of E_2 (2610) category.
3. There is significant difference between the earnings of E_3 and E_4 categories. The earning of E_3 (9250) category is significantly higher than that of E_4 (4500) category.
4. There is no significant difference between the earnings of E_1 and E_2, E1 and E_4 and between E_3 and E_4 categories.

IV. Monthly Wage Earners

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of Monthly Wage Earners were computed. The data and results are given in table 11.

Table 11
Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Occupation - Monthly Wage Earners

Source	Sum of Squares	df	Mean Square	F
Between Groups	3181715576.63	3	1060571858.87	45.28***
Within Groups	22765331144.67	972	23421122.57	
Total	25947046721.31	975		

*** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 45.28, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of Monthly Wage Earners belonging to different Educational categories. Duncan's Test shows that:

1. There is significant difference between the earnings of E_1 and E_2 categories. The earning of E_2 (6570) category is significantly higher than that of E_1 (2744) category.
2. There is significant difference between the earnings of E_1 and E_3 categories. The earning of E_3 (9158) category is significantly higher than that of E_1 (2744) category.
3. There is significant difference between the earnings of E_1 and E_4 categories. The earning of E_4 (9824) category is significantly higher than that of E_1 (2744) category.
4. There is significant difference between the earnings of E_2 and E_3 categories. The earning of E_3 (9158) category is significantly higher than that of E_2 (6570) category.
5. There is significant difference between the earnings of E_2 and E_4 categories. The earning of E_4 (9824) category is significantly higher than that of E_2 (6570) category.
6. There is no significant difference between the earnings of E_3 and E_4 categories.

b. Earnings of Same Educational Category – Occupational Groups

The difference between the mean earnings of same Educational Category in the Agriculturists, Businessmen, Daily Wage Earners and Monthly Wage Earners sub samples are found out using ANOVA and is presented below:

I. Educational Category - E_1

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_1 Educational Category of Agriculturists, Businessmen, Daily Wage Earners and Monthly Wage Earners were computed. The data and results are given in the table 12.

Table 12
Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_1 Educational Category Based on Occupation

Source	Sum of Squares	df	Mean Square	F
Between Groups	694522897.17	3	231507632.39	22.43***
Within Groups	10652480307.45	1032	10322170.84	
Total	11347003204.63	1035		

*** Significant at 0.01 level

From table it is observed that the value of F statistic is 22.43, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of various occupational groups belonging to E_1 Educational Category. Duncan's Test shows that:

1. There is significant difference between the earnings of Agriculturists and Businessmen. The earning of Businessmen (5936) are significantly higher than that of Agriculturists (3705).
2. There is significant difference between the earnings of Businessmen and Daily Wage Earners. The earning of Businessmen (5936) are significantly higher than that of Daily Wage Earners (3047).
3. There is significant difference between the earnings of Agriculturists and Monthly Wage Earners. The earning of Agriculturists (3705) are significantly higher than that of Monthly Wage Earners (2744).
4. There is no significant difference between the earnings of Agriculturists and Daily Wage Earners, Agriculturists and Monthly Wage Earners and between Daily Wage Earners and Monthly Wage Earners.

II. Educational Category - E_2

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_2 Educational Category of Agriculturists, Businessmen, Daily Wage Earners and Monthly Wage were computed. The data and results are given in table 13.

Table 13
Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_2 Educational Category Based on Occupation

Source	Sum of Squares	df	Mean Square	F
Between Groups	1178225330.25	3	392741776.75	32.69***
Within Groups	5527109755.95	460	12015455.99	
Total	6705335086.20	463		

*** Significant at 0.01 level

From table it is observed that the value of F statistic is 32.69 which are highly significant. The result thus indicates that there is significant difference in the earnings of various occupational groups belonging to E_2 Educational Category. Duncan's Test shows that :

1. There is significant difference between the earnings of Agriculturists and Businessmen. The earning of Businessmen (6672) are significantly higher than that of Agriculturists (4000).
2. There is significant difference between the earnings of Agriculturists and Daily Wage Earners. The earning of Agriculturists (4000) are significantly higher than that of Daily Wage Earners (2610).

3. There is significant difference between the earnings of Agriculturists and Monthly Wage Earners. The earning of Monthly Wage Earners (6570) are significantly higher than that of Agriculturists (4000)
4. There is significant difference between the earnings of Businessmen and Daily Wage Earners. The earnings of Businessmen (6672) is significantly higher than that of Daily Wage Earners (2610).
5. There is significant difference between the earnings of Daily Wage Earners and Monthly Wage Earners. The earnings of Monthly Wage Earners (6570) is significantly higher than that of Daily Wage Earners (2610).
6. There is no significant difference between the earnings of Businessmen and Monthly Wage Earners.

III. Educational Category - E_3

Total sum of squares, mean sum of squares and F ratio for the mean earnings of E_3 Educational Category of Agriculturists, Businessmen, Daily Wage Earners and Monthly Wage Earners were computed. The data and results are given in table 14.

Table 14
Summary of Analysis of Variance (ANOVA) Of Mean Earnings of E_3 Educational Category Based on Occupation

Source	Sum of Squares	df	Mean Square	F
Between Groups	567489016.50	3	189163005.50	5.13***
Within Groups	19329918180.46	524	36889156.83	
Total	19897407196.97	527		

*** Significant at 0.01 level

From table it is observed that the value of F statistic is 5.13, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of various occupational groups belonging to E_3 Educational Category.

To find out which Occupational groups differ significantly in their earnings E_3 Educational Category, Duncan's Test is used and the results are given below.

1. There is significant difference between the earnings of Agriculturists and Businessmen. The earning of Businessmen (9956) are significantly higher than that of Agriculturists (4375).
2. There is significant difference between the earnings of Agriculturists and Daily Wage Earners. The earnings of Daily Wage Earners (9250) are significantly higher than that of Agriculturists (4375).
3. There is significant difference between the earnings of Agriculturists and Monthly Wage Earners. The earning of Monthly Wage Earners (9158) are significantly higher than that of Agriculturists (4375).
4. There is no significant difference between the earnings of Businessmen and Daily Wage Earners, Businessmen and Monthly Wage Earners and between Daily Wage Earners and Monthly Wage Earners.

IV. Educational Category - E_4

Total sum of squares, mean sum of squares and F ratio for the mean earnings of E_1 Educational Category of Agriculturists, Businessmen, Daily Wage Earners and Monthly Wage Earners were computed. The data and results are given in table 15.

Table 15
Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_4 Educational Category Based on Occupation

Source	Sum of Squares	df	Mean Square	F
Between Groups	177265597.71	3	59088532.57	2.32*
Within Groups	5545899807.69	218	25439907.37	
Total	5723165405.40	221		

*Not Significant at 0.05 level

From table it is observed that the value of F statistic is 2.32, which is not significant. The result thus indicates that there is no significant difference in the earnings of various occupational groups belonging to E_4 Educational Category.

Conclusion

1. Education is an important factor that determines the economic status of people irrespective of locality, gender and occupation. and economic background of family.
2. The economic status of more educated people will be higher than the economic status of less educated.
3. Education affects the economic status of people differently.
4. Factors such as locality, gender and occupation influences the economic status of educated people.

Educational Implications

1. As education is an important factor determining the economics status measures may be taken for the educational development of people.
2. From the school stage itself, students should be familiar with vocational aspects of education so that it would be helped to earn them a living.
3. Educational practices should be purposeful, creative and productive occupational information, guidance and counselling, socially useful productive work or fieldwork could be arranged for the vocational development of students.
4. Studies may be motivated to find out the reasons and remedies for the differences in the earnings of people having the same level of education.

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DISABILITY STUDIES AS A TOOL PROMOTING INCLUSIVE VOCATIONAL EDUCATION AND TRAINING FOR THE PERSONS WITH DISABILITIES

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Abstract

*Planning Commission in their XIIth Five Year Plan -FYP (2012-2017) laid emphasis on A**ccess and Expansion, Equity and Inclusion and; Quality and Excellence** in the programmes that are offered at various levels. To achieve this, the University Grants Commission, New Delhi in its 12th FYP document, emphasized the need for Inclusive and Qualitative Expansion of Higher Education. In the words of Ban Ki-moon (2011), 'development can only be sustainable when it is equitable, inclusive and accessible for all. Persons with disabilities need therefore to be included at all stages of development processes, from inception to monitoring and evaluation. Addressing negative attitudes, lack of services or ready access to them, and other harmful social, economic and cultural barriers will benefit all of society'. In this respect, everyone including the persons with disabilities should be empowered to access all basic needs and included in the developmental processes starting from basic education to livelihood opportunities. Though the persons with disabilities may have difficulty in accessing education because of their deficiency in certain physical or mental functions, inclusive planning of any tasks help them to become self-dependent and a useful member of the society. However, providing technical education and training to the persons with disabilities is not a simple task but a great challenge and new avenues and methods will have to be developed to achieve this very difficult task.*

This article provides certain reflections on the status of education and employment of persons with disabilities in India apart from discussing the vocational education and training opportunities available for the persons with disabilities. The authors validate the role of disability studies in empowering the disabled holistically, more particularly in vocational education and training and help them to acquire necessary skills. The authors concludes by rationalizing the need for establishing the disability studies as an academic discipline at college and university levels to empower the persons with disabilities to provide equity, access, and quality in both education and vocational education at different levels to promote inclusive societies.

Key Words : Disability, Inclusive Education, Vocational Education, Inclusive Societies, Disability Studies, etc.

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Status of Education and Employment of the Persons with Disabilities

Education

Education is the key to the advancement of persons with disabilities as it provides access to information, enables them to communicate their needs, interests and experiences, brings them into contact with other people, increases their confidence and encourages them to assert their rights. Without a basic education, their chances for employment and other aspects of life are almost nil. There is a dearth of policies and programs that specifically address the educational needs of disabled people, and the failure of disability equity programs to serve them. Also the policies and programs in education for disabled people were more concentrating on residential special education centers, which segregates people with disabilities and promote only exclusion policies than inclusion.

When looking at the information on the educational participation of people with disabilities, the first problem is with the estimates of the number of children of school-going age with disabilities. The total population of children with disabilities in the 5 to 14 years age group estimates about 10.39 million i.e. 5 percent of the age group (Mukhopadhyay & Mani, 2002). In contrast, the Ministry of Human Resource Development, (2004) states that there are 1.6 million children with disabilities in the 6 to 14 years age group, while in 2005 the figure was 1.85 million children. However, Census figures from 2001, suggest that about 1.92 percent of the children of the 5-14 age groups have disabilities, i.e. 3.88 million, while NSS figures are 3.12 million in 2002.

The second problem is that different sources generate very different estimates of the number of children with disabilities in school. The survey carried out by National Council for Educational Research and Training (NCERT, 1998) figures about 84,000 children with disabilities were enrolled in schools, also an unpublished data gathered for the Ministry of Human Resource and Development in 1999 suggested that approximately 55,000 children with disabilities were enrolled in schools. Thus "the picture (of school enrolment for children with disabilities) is dismal" since (by these counts and using the highest estimate of the total population of children with disabilities) less than 1 percent of children with disabilities attend the school (Mukhopadhyay & Mani, 2002).

The Ministry of Human Resource Development, (2004) claimed that 1.08 million children with disabilities were being educated, and by using a very low estimate of the total number of children with disabilities, thus arriving at an estimate of 67.5 percent of children with disabilities receiving education. These discrepancies are so huge – from less than 1 percent to over 67 percent – and so little information is provided in these sources about how the figures were calculated, that the obvious explanations (different definitions of disabilities, differences in what is considered to be education, whether enrolment or attendance data are used, and so on) are inadequate to make sense of what is going on.

Data gathered from the NSSO, (2003) 58th round survey (Jul- Dec 2002) suggest that about 45 percent of people with disabilities are literate. In contrast, the 2001 Census literacy rate of the total population is 64.8 percent. The NSSO data highlighted that 25 percent of the literate population with disabilities had received education up to the primary level, 11 percent up to the middle level, while a mere 9 percent continued up

to or beyond the secondary level. In urban areas around 11 percent of those with disabilities in the 5 to 18 years age group were enrolled in special schools, while this was less than 1 percent in rural areas. This reflects the significant growth in the number of special schools, especially in urban areas. In the early 1990's there were about 1,035 special schools (Ministry of Human Resource Development, 1992). Nearly a decade later it was estimated that there were about 2,500 special schools in the country (Rehabilitation Council of India, 2000). Most of these schools are in urban areas, with Mumbai having the highest number of schools (Mukhopadhyay & Mani, 2002).

Over the past decade or so, there have been some important developments in the provision of educational opportunities for children and young people with disabilities. In 1987 the Integrated Education for Disabled Children (IEDC) scheme was launched at a national level. However, this scheme did not meet with much success as few people knew about the scheme and only a few children received any equipment and services, while teachers remained untrained and unable to respond to the needs of these children. In 1995 the education of children with disabilities came under renewed focus in the District Primary Education Programme (DPEP) and this has continued in the more recent Sarva Shiksha Abhiyan (SSA or Education for All).

The First Joint Review Mission of SSA in 2005 (Department of School Education and Literacy, 2005), referring to the education of children with disabilities, noted that "at the same time as invariably improving, coverage remains incomplete and an examination of the physical and financial progress reported by States thus far for the current year shows implementation to be poor, suggesting that this area is not receiving sufficient priority. Interventions reported tend to follow a medical model with attention to providing aids and appliances to physically challenged children". Similar views were expressed in the Third Joint Review Mission for Bihar undertaken in Jan. 2006, where it was noted that while enrolment was being considered "attention will be given to the provision of quality education to children with disabilities" (Department of School Education and Literacy, 2006). The significant financial resources allocated to the SSA programme were actually a problem, noting that there is great pressure on education staff to spend, and be seen to be spending, their budgets. Still the education for persons with disabilities continues to be on identifying and assessing children with disabilities, and responding to their needs through the provision of assistive aids and appliances. This focus on changing structural issues, rather than reviewing the teaching and learning processes in the classroom, is rather limiting. The perception of disability being a problem which is located in the child and hence needs to be corrected still dominates and little focus is placed on examining the environmental factors that might be negatively impacting on the child's ability to participate. Overall, the emphasis is primarily on giving access to children with disabilities, with little regard being given to their participation in the classroom, culture or the curriculum (Singal, 2006a, 2006b).

In the year 2003, the Ministry of Social Justice and Empowerment has introduced novel scheme of providing scholarships for people with disabilities to pursue higher education. The important feature of this programme is it reserves 50% of scholarships for women with disabilities. While enrolments have seemingly increased for those with disabilities, data

also suggest that only very few of them complete the primary cycle of education and even fewer make it to the secondary, let alone higher levels of education. This has a notable impact on their employment opportunities later in adult life, especially in the context of a rapidly changing market economy. Primary education gives the basic three r's, rarely it provide skills necessary for employment—self employment or otherwise ensure a reasonable level of wages and economic living (Tilak, 2005). Thus the exclusion of persons with disabilities from education unarguably results in their exclusion from very significant opportunities for further development particularly reducing their access to vocational training, employment and social life.

Employment

The ability and the opportunity to earn a livelihood whether in a formal job or through some kind of self-employment is an important determinant for an individual's well-being. In addition, and indeed apart from education, vocational training is an important way in which people with disabilities can become economically independent. Also, United National Development Programmes (UNDP) and Planning Commission in their Summary Report (UNDP, 2011) of their project 'Livelihood Promotion Strategies' highlighted the fact that the disadvantaged women and men have limited livelihood options and are highly dependent on agriculture and the informal sector. Also, emphasized improved access to basic education, vocational training relevant to labour market needs and jobs suited to their skills, interests and abilities, with adaptations as needed for promoting more inclusive societies and employment opportunities for people with disabilities in both developed and in developing countries. Further, UNDP (2011) pointed out the barriers like (i) inadequate management information system, (ii) lack of universal definition in understanding disability, (iii) lack of detailed and centralized reporting system, (iv) lack of transparency and information sharing, (v) underutilization of the quota for PwD's in schemes including job reservations, (vi) impact of gender on disability is manifold and, (vii) prejudice remains deeply embedded in social, political and economic institutions in making the PwD's to involve in livelihood activities (as cited in Poornima and Reddy, 2012). The Ministry of Labour has set up various Vocational Rehabilitation Centres (VRCs). Only a small percentage of people with disabilities receive vocational training. In 2002 the figures were appalling that 1.5 percent and 3.6 percent of the people with disabilities in rural and urban areas respectively received any training. These figures have not changed much since 1991.

Other government initiatives encourage people with disabilities to explore avenues for self-employment through schemes such as the Sampoorn Gramin Swarozgar Yojana (SGSY). This scheme promotes self employment opportunities through self help groups and, according to official estimates, it has assisted 24,235 people with disabilities from 1999-2003 (Singh & Dash, 2005). A Committee set up by the Ministry of Social Justice and Empowerment made an in-depth study of the various jobs done in Government Offices as well as Public Sector Undertakings and identified 1100 posts out of 3000 posts listed in the National Classification of Occupations as suitable for the PwD's. Also, the Committee identified the physical

requirements for all these jobs. Additionally, the National Handicapped Finance and Development Corporation (NHFDC) under the Ministry of Social Justice and Empowerment (MSJE) is involved in forwarding loans at low rates of interest for encouraging persons with disabilities to establish their own micro-enterprises either on an individual basis or by establishing self-help groups. However, there is no appreciable information to indicate how successful these attempts have been. Since 1995, under the Persons with Disability Act (Ministry of Law and Justice, 1996), there has been a 3 percent reservation in all categories of jobs in the government sector and a strategy of giving incentives to private sector employers for promoting employment of people with disabilities.

Mitra and Sambamoorthi, (2006) using NSSO 2002 data, noted that "among all working age persons with disabilities, 37.6 percent were employed". Only 4.8 percent of all working age persons with disabilities are 'salaried-wage employees', and in general, the chances of a persons with disabilities being in employment of any kind were roughly 60 percent of those of the general population.

In understanding work participation, the type of impairment is also an important variable. NSSO, (2003) found 40 percent and 39 percent of people with locomotor impairments are not employed in rural and urban areas respectively. Approximately 60 percent and 52 percent of people with sensory impairments (hearing, visual and speech) are not employed in rural and urban areas respectively. Also mentally retarded are not employed in rural area and urban area at the percent of 82 and 80 respectively.

Data suggest that, across the board, irrespective of the type of impairments, most people with disabilities tend to be casual labourers, or attending domestic services or indeed begging. The 2001 Census reports that 52 percent of those not working are 'dependents', with another 15 percent engaged in 'household duties' and 25 percent 'students' (Registrar General of India, 2001, Table C 24). Reporting the results a survey conducted of the top 100 companies by the NCPEDP during 1999, Zutshi, (2004) noted that the average percentage of employees with disabilities in the public sector (23 companies) was 0.54 percent, in the private sector (63 companies) was 0.28 percent, and in multinationals (14 companies), 0.05 percent.

On the other side disabled women in particular, are not usually part of employment debates and initiatives. They are usually at least twice as unlikely as disabled men to get a job. For women with disabilities, this discrimination in employment sector is far greater. In situations where there is high unemployment, opportunities for remunerative work tend to be severely limited. When disabled women do find jobs, they receive considerably lower wages. Furthermore, in addition to the prejudice and discrimination barrier, the inaccessibility of the physical environment (e.g., buildings, roads, transport and toilet facilities) is a serious obstacle to disabled women working outside their homes. Since the lack of mobility limits disabled women from obtaining raw materials and marketing their products themselves, engaging in piece-work is the most common form of income-generation available to them. Also, they are exposed to social stigma and stereotyping attitude, which leads them to

feel devalued, isolated, and ashamed within their working environment.

Employment enables any person to develop a sense of identity and self-esteem apart from economic independence. For ensuring employment opportunity, safety and security, vocational education and training plays a vital role in the life of the persons with disabilities.

Status of Vocational Education and Training for the Persons with Disabilities in India

Vocational Education and Training should address all sections of the population, offering attractive and challenging pathways for those with high potential, while at the same time addressing those at risk of educational disadvantage and labour market exclusion for example, those with special needs. Goel (n.d.) in India's Country Report highlighted the importance of technical and vocational education in human resource development of the country by creating skilled manpower, enhancing industrial productivity and improving the quality of life. Mavromaras and Polidano (2011) found that vocational training has a strong and long lasting effect on improving the employment probabilities of people with disabilities. Their study proved that PwD's who undertake vocational education is shown to be more likely to experience a long-term improvement in their employment position. Also, the completion of a qualification by a person with a disability could signal not only an applicant with specific vocational skills but also an applicant with increased levels of motivation and commitment.

Goel (n.d.) noted the terms such as *technical education, vocational training and vocational education* was used interchangeably in Indian context. *Technical education* refers to the post secondary course of study and practical training, whereas *vocational training* refers to lower level education and training for the population of skilled or semi skilled workers in various trades. *Vocational education* includes education and skill development at all levels starting from post primary to tertiary education both through formal and non-formal programmes. The agencies such as National Skill Development Council, Ministry of Human Resource Development, Ministry of Labour and Employment, Directorate General of Employment and Training at Central level and the Directorates of Technical Education at State level are involved in providing Vocational Education and Training.

The Directorate General of Employment and Training which is an apex body in organizing, developing and coordinating any vocational training, under the Ministry of Labour and Employment established Vocational Rehabilitation Center's (VRC's) for the PwD's for assessing vocational and psychological needs of the handicapped persons and to render rehabilitation assistance to them. At present there are 20 VRC's along with 7 Skill Training Workshops (STW's) attached to seven VRC's that impart non-formal training in the trade's best suited to an individual disabled person. Rehabilitation services of the VRCs have also been extended to the disabled persons at their door steps living in rural areas through the mobile camps and Rural Rehabilitation Extension Centres (RRECs), Community based Vocational Training (CBVT) and Community based Rehabilitation Centres (CBR's). These RRECs have been set up in eleven blocks under five VRCs namely, Chennai, Kanpur, Kolkata, Ludhiana and Mumbai. The functions of the VRC's are detailed below :

1. Interviewing adult handicapped persons for knowing their personal, social, family, educational, economic and vocational background causing adjustment problems.
2. Admission of the handicapped persons to examine medically to assess their physical efficiencies, measure their psychological strengths and weaknesses in respect of their intelligence, aptitude, areas of interest, psychomotor dexterity, personality traits and areas of adjustment.
3. Assessing the residual capacities, attributes, and functional skills of different categories of handicapped.
4. Examination of the handicapped persons by a panel of medical specialists to identify the degree of disability and functional capacities and suggest remedial measures.
5. Testing of the handicapped persons on the job capabilities in different trades sanctioned under VRC's programmes such as Electronics, Electrical, General Mechanic, Radio & TV repair, Commercial Practice, Air-conditioning & refrigeration, Automobile, Cutting and Tailoring, Computer Applications, Wood Work & Chair Canning, Arts & Crafts, Screen Printing, Photography, Metal Trades, Secretarial Practice, Painting, etc.
6. Imparting workshop training to develop vocational adjustment in respect of their work habits, on the job sustainability, to ensure their job adjustment best suited to their strengths and weaknesses.
7. Evaluating the handicapped clients at the Centre to assist them in preparing their vocational plan for enhancing their levels of knowledge & skills suited to local job market needs and also assisting, guiding and motivating them for diverting to self-employment.
8. Imparting in-plant training under the scheme of Ministry of Social Justice and Empowerment during which clients are given stipend to sustain their interest and motivation in the training.
9. Sponsoring and assisting the handicapped persons to utilize the facilities of reservations against the seats in various educational/training institutions.
10. Sponsoring the handicapped persons to the employers against vacancies notified to the VRCs and taking follow up action.
11. Recommending the handicapped persons for grant of loans by the concerned financial institutions under differential rate of interest or setting up of different ventures under various self-employment schemes.

The established VRC's are coordinated by several National Institutes like National Institute for the Mentally Handicapped, National Institute for the Visually Handicapped, National Institute for Speech and Hearing, National Institute for Orthopedically Handicapped, Ali Yavar Jung National Institute for the Hearing Impairment and so on. These VRC's further collaborate with the nearby Schools, NGO's, other Vocational Training Centres and Special Employment Exchanges.

Menon (1990) highlighted the following limitations of the Vocational Training Programmes for the Mentally Retarded.

1. Vocational training has no relationship with employment. In majority of cases, who complete the training rarely a job waiting for them, nor such people are trained to run self-employment units.
2. Vocational trades taught at such centers are often complex and it takes a long time to master them,
3. There is no fixed training period nor there any formal graduation. Training continues as long as person with mental retardation continues to attend the center.
4. There is a lot of wastage of raw materials.
5. Vocational training is given only by the untrained or partially trained persons.
6. Training is given in protected environment, employment outside these conditions is neve thought of, as a result, there are limited opportunities for replication.
7. The trades are chosen keeping in view what the person with mental retardation can possibly learn and perform. Rarely any market survey is done to assess the market demand and tailor the job to suit market conditions.

Likewise, it is noted that most of the VRC's focus to impart vocational training on specific trades related to craft activities like candle making, chalk making, caning of chairs, basket making, weaving, book binding, printing, making of envelops, greeting cards etc.,. Further, Menon (1990) noted some of the projects in Sheltered Workshop which deal with (a) manufacture of toys and teaching aids, (b) assembly work related to telephone components, (c) laundry, (d) packaging and (e) production of goods for home use like bakery, pickle, papad etc.,.

Vocational Education for the PwD's is offered at all levels i.e. schools (regular, integrated and special) at higher secondary level, open schooling, ITI's, polytechnics and universities. Various schemes had been initiated to promote their education, to note one is Higher Education for Persons with Special Needs –HEPSEN. The data pertaining to the enrolment of PwD's in Vocational Education is not known.

Some of the NGO's like EnAble India is offering courses related to Career Centric Computer Training, Need Based Computer Training, Medical Transcription courses, Cisco Certified Network Associate Program (develop skills related to ICT), BPO- Non Voice Course, Employability for manual / Unskilled Jobs, Technical Writer Jobs, Life Skill Courses and so on. Other organizations providing VET to the PwD's are National Association for the Blind, Ability Foundation, Chetana, Blind People's Association, Association of People with Disability, Mobility India, Sense International India, Atmavishwas etc., Some of these organizations train the PwD's in livelihood initiatives primarily focusing on Technical training covering mechanical and information technology courses and the increasingly popular Horticulture training programme, while others focus on the routine craft activities.

Inspite of the efforts, data shows that the disabled people continue to be disproportionately excluded from the labour market. Moreover, people with learning and intellectual disabilities are less likely to be in work than those with physical disabilities. Similarly in the Western World, the PwD's are less likely to be in paid employment and more likely to be paid less than people without disabilities (Stern, 1989, Baldwin and Johnson, 1994, Wilkins, 2004 and Gannon, 2005). EnAble India noted that only

40% of disabled youth in India have completed high school or have employable skills. Just 1% of PwD's of working age are gainfully employed. 70% of the disabled working population lives in the country's rural areas. Census (2001) noted that only 49 % of the disabled populations are literate and 34 % are employed. Although, the data from various sources depicts different figures of employment rate of PwD's, the ground reality in India is a huge demand and supply gap in the employment sector both for persons with and without disabilities. For PwD's, employment and earning is even more complex phenomenon.

The major lacuna observed is poor organization of the vocational education and training services provide through various sources. The GO's (National Institutes, Universities etc.,), NGO's and other organizations work in isolation and are not coordinated in any of their activities. There is a strong need of collaboration between these organizations to better promote VET in particular and empower PwD's in general. For this the authors put forth the establishment of Disability Studies Centers for better coordination of the activities which serve as a catalyst and forum to the persons from different fields to collaborate, coordinate, cooperate and communicate in better ways and means promoting PwD's. Further section will cover the concept, meaning and need of disability studies and rationalize the need for establishing Disability Studies Centers.

Concept and Meaning of Disability Studies

Disability Studies refers generally to the examination of disability as a social, cultural, and political phenomenon. In contrast to clinical, medical, or therapeutic perspectives on disability, Disability Studies focuses on how disability is defined and represented in society. It rejects the perception of disability as a functional impairment that limits a person's activities. From this perspective, disability is not a characteristic that exists in the person or a problem of the person that must be "fixed" or "cured." Instead, disability is a construct that finds its meaning within a social and cultural context.

Disability Studies is a vibrant and diverse area of academic inquiry. First, it is interdisciplinary and multi-disciplinary. No single academic discipline can place a claim on Disability Studies. Rather, the field is informed by scholarship from such different disciplines as history, sociology, literature, political science, law, policy studies, economics, cultural studies, anthropology, geography, philosophy, theology, gender studies, communications and media studies, engineering, architecture and the arts.

Second, Disability Studies includes a diverse group of people. People who are blind or deaf or who use wheelchairs, have chronic pain, or learn at a slower pace than other people and so on, have vastly different experiences and perspectives. Yet they share in common society's definition of them as disabled, with consequences for how they are viewed and treated by the majority which is presumed to be nondisabled.

Finally, defining what Disability Studies is may also be informed by what it is not. It is not medicine, rehabilitation, special education, physical or occupational therapy, and professions oriented toward the cure, prevention, or treatment of disabilities. Although Disability Studies scholars generally subscribe to the minority group model of disability — the view that the status of people as a minority shapes their experiences in society — they agree on little else. For example, some Disability Studies

scholars view disability in terms of culture and identity, while others see disability as a label and a social construct. Some Disability Studies Scholars use different language to refer to the people at the center of inquiry in Disability Studies. Disabled person is used to draw attention to the centrality of disability in individual identity; person with a disability or "people first language" conveys the idea that having a disability is secondary to a person's identity as a human being; person labeled as disabled (mentally retarded, mentally ill, and so on) focuses on how disability is a socially constructed definition imposed on people who may or may not agree to this characterization.

In short, Disability Studies challenges the way in which disability is constructed in society. Disability studies in several forms also involves the development of the theoretical, research, educational, and advocacy models necessary to remove the legal, physical, policy, and attitudinal barriers that exclude people with disabilities from society. Disability Studies, therefore, has the potential to benefit people with disabilities as well as society by the participation and presence of people with disabilities in our schools, our neighborhoods, our workplaces, and in our lives.

Disability Studies, like Women's Studies and other disciplines, has its origin in the civil rights movements. It is based on the notion that, as with other oppressed groups, people with disabilities share a history, a culture, and a desire for social, political and economic self determination. Through Disability Studies, the collective voices of the disability community and allies form the content and method of instruction that can inform others. The content of Disability Studies includes history, literature, politics, sociology, law and economics.

Potential audiences of Disability Studies are not limited to the traditional audiences or disciplines, who comprise the so-called "helping" professions (e.g., health, education, social work, rehabilitation and psychology). Rather, stakeholders are a much broader group and include business, law, political science, history, economics, public policy, the arts, sociology, journalism, engineering, recreation, sports and leisure, architecture, and the disability communities, themselves. Disability Studies is different from the more traditional course work on disabilities offered to future disability service providers, such as rehabilitation counsellors or special education teachers (as cited in Bryen and Shapiro, 1996).

Paradigms of Disability Studies

From the above, it is clear that the five paradigms of disability studies are :

1. First, the paradigm for viewing disabilities is quite different. It considers disability as a natural part of the human condition rather than a defect or impairment that needs fixing.
2. Second, the focus of "intervention" is paradigmatically different- "fixing" systems so that they are accessible to and usable by people with disabilities rather than fixing people so that they can better fit into existing systems.
3. Third, stakeholders or audiences are different. They include engineers, business people, journalists, lawyers and policy makers not just teachers, doctors and social workers.
4. Fourth, teachers and researchers continue to be the "experts". However, "experts" are expanded to include people with disabilities themselves rather than solely

professionals who may know about the various medical and educational conditions that have historically defined disabilities.

5. Finally, the outcomes of Disabilities Studies are different. They include an understanding of history, politics, economics and civil rights, not just an understanding of diagnosis, prevention, and treatment.

Status of Disability Studies in India

In India, the field is still in its embryonic stage. It is confined mostly to education and rehabilitation services. In other words, charity oriented approach is still in practice and is slowly moving towards rights based approach. Recently, in India too, here and there a handful of Universities have started Centre for Disability Studies and still they lack proper direction due to non-availability of trained manpower in this emerging area. With regard to research, it is confined mostly to the education and rehabilitation components but not addressed wholistically the issue of disability as well as gender and sexuality. A close look at the western scenario of disabilities clearly shows a better inclusive barrier free and rights based society for persons with disabilities than in India (Reddy, 2005). As India is moving fast advanced countries list, it is right time for us to make our society to be more inclusive and barrier free for persons with disabilities, so that every individual born in this country contribute significantly for the developmental process.

As already discussed, the disability study is not uni-disciplinary but multi-disciplinary and cross-disciplinary in nature. It requires the expertise of Sociology, Economics, Political Science, History, Anthropology, Psychology, Education / Special Education, Physiology, Medicine, Science & Technology and allied areas. In India sporadic attempts have been made by different disciplines to study the disability concepts in sectorial viewpoint and wholistic attempts have not been made. The disability studies are confined only to special education components in some of the universities at B.Ed and M.Ed levels. Reddy (2005) observed the National Institutes like National Institute for Mentally Handicapped (Hyderabad), Aliyavar Jung National Institute for Hearing Impaired (Bombay), National Institute for Visually Handicapped (Dehradun), National Institute for Orthopaedically Handicapped (Culcutta), National Institute for Rehabilitation and Research for Handicapped (Cuttack) and National Institute for Physically Handicapped (New Delhi), National Institute for Speech and Hearing (Mysore) and National Institute for Multiple Disabilities (Chennai) are offering specialized professional courses with a view to develop man power for delivery of services to impart training to professionals in different areas of disabilities. The courses ranging from degree courses in physio-therapy, occupational therapy, prosthetic and orthotic engineering and bachelor degree course in mental retardation, diploma in special education, diploma in vocational training and employment, Bachelor's and Master's degree in education with specializations on Hearing Impaired, Visual Impairment, Orthopaedically Handicapped, Mentally Retarded, Multiple Disabilities, Speech and Language disorders, Audiology and Speech and so on. A couple of universities are also offering pedagogic degrees in special education through distance mode.

The National Institutes are also conducting various short-term programmes from time to time to the Government and Non-Governmental personnel involved in

the field of education, vocational training, employment etc. and also organizing workshops, seminars and symposia to provide opportunities to the professionals to abreast their knowledge in the field of disability. The courses are conducted at the Head Quarters and in the Regional Institutes apart from in Non-Governmental organizations here and there. These institutes are playing a crucial role with regard to imparting training to the professionals in disability area. A handful of universities are also offering B.Ed. and M.Ed. programmes in special education and concentrating research in special education.

An analysis of disability studies programme in India clearly indicates that the programmes are more oriented towards rehabilitation services recently extending to education of persons with disabilities. Disability Studies in India have not focused in extending to the Vocational Education and Training of the PwD's. Most of the programmes whether it is basic education nor the vocational education are in sectorial approach and facilitating compartmentalization but not addressing the issue from social, cultural, multi-disciplinary and cross-disciplinary orientations. It is moving slowly from medical model to a social model of disability.

Significance of Disability Studies Programmes in India

In India, the disabled population is more compared to the rest of the world. This necessitated the development of appropriate academic and research programs apart from community rehabilitation services so as to empower the people with disabilities and persons working with disabilities. In the west, good number of educational institutions and service organizations are involved in organizing such programmes. But in India, recently steps have been taken to start the Centers for Disability Studies at university levels and introduce disability studies courses at graduate and post graduate levels apart from research initiatives (Karna and Reddy, 2010). However, there are miles to go to catch the western foots in this direction. Reddy and Poornima (2011) clearly delineated the need for disability studies programmes in Indian context for the following reasons: *Create Realistic Data Base on Persons with Disabilities; Manpower Development; Development of Research and Innovations; Documentation and Dissemination of Information; Protect the Rights of the Persons with Disabilities; Multidisciplinary and Interdisciplinary Nature of Disability Studies; Organizing Sensitization Programmes and Infusing Disability Components at Various Levels.*

Concluding Remarks

The established Disability Studies Centers may act as a Nodal agency in coordinating the activities of all the organizations concerned with VET of the PwD's. With multidisciplinary orientations such center shall carry out the activities like : framing acts and policies for vocational education and training, identify the jobs suitable for the disabled, framing curriculum for training in such identified jobs, incorporating and implementing the curriculum right from the secondary school education, systematic job analysis and training, ecology based assessment and selection of job tasks preparing PwD's for the jobs in demand, preparing assessment tools for assessing vocational potentials for PwD's, human resource development for training the PwD's in particular skills / jobs, identifying and removing the barriers in VET

for PwD's, partnership with the stakeholders, involve professionals from other fields, framing and introducing need based courses having employment opportunities offering multi skills, life skills and soft skills, identify the interests, abilities and special talents of PwD's, carry out participatory action research, involve PwD's in decision making, document and disseminate information, sensitize the stakeholders, support in terms of aids and appliances, identity new ways and means of providing VET for the PwD's (e-learning, open schooling etc.,.) and, many more.

As disability studies are being offered with multi and cross disciplinary orientations, the activities carried out will involve professionals from different fields and normally the success rate will double when compared to the activities of single disciplinary orientations. No doubt that the Disability Studies will serve as a catalyst in promoting VET of the PwD's. Further analysis and research in this area is needed.

The disability studies, by focusing on the aspects of disability makes the excluded populations to move from dependency to independent living, charity to parity, self-doubt to self empowerment, incompetence to competence, isolation to synergy and despair to hope, to promote inclusive societies. To achieve this end, the University Grants Commission, New Delhi should be given funding for setting up of Centers for Disability Studies in each University with the main focus on developing innovative academic, training, research and extension programmes concerning disability studies that address better policy planning, development and implementation to promote inclusive societies. Only then, the goals of 12th Five Year Plan (2012-2017) i.e. ***access and expansion***, ***equity and inclusion*** and; ***quality and excellence*** in programs offered at various levels shall be achieved.

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LEARNING STYLES AND SOCIO-EMOTIONAL COMPETENCIES OF ADOLESCENTS

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Abstract

Learning styles are various approaches or ways of learning. In the process of leaning there are four learning styles according to David A Kolb. This paper tries to identify the different learning styles and the socio-emotional competencies of adolescents. 244 students studying in class IX of various government, aided and private school were selected for this study. The Adolescents' Learning Styles Inventory and Socio-Emotional Competency Scale prepared and validated by the investigator were used for collecting the data. The data were analysed with the help of the statistical techniques like; mean, standard deviation, and one-way ANOVA. The major findings of the study are: a) students with Accommodating learning style is comparatively higher in number in relation with other learning style groups; b) Diverging learning style is less preferred by the adolescents: c) the adolescents showed above average Socio-Emotional Competencies; and the different learning styles categories are not significantly differ in the socio-emotional competencies. The study reveals that systematic training is needed for scientific learning styles and affective domain competencies especially the emotional and social competencies for better adjustment and for solving the life conflicts.

Key Words: *Learning Styles, Socio-Emotional Competencies, Assimilating, Accommodating, Converging, Diverging, Self Awareness, Self Regulation, Motivation, Empathy, Social Skills, etc.*

INTRODUCTION

In education, learning requires more than seeing, hearing, feeling, moving, or touching to learn. We integrate what we sense and think with what we feel and how we behave. Active learning results in longer-term recall, synthesis, and problem-solving skills than learning by hearing, reading, or watching. Western education needs to move from a learning-by-telling model and even learning-by-observing (as in the case-method) to a learning-by-doing model. We must move from passivity to activity. We must learn to extrapolate from our experiences and see how to apply what we've done to new instances.

Learning styles are, various approaches or ways of learning. They involve educating methods, particular to an individual that are presumed to allow that individual to learn best. It is commonly believed that most people favour some

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particular method of interacting with, taking in, and processing stimuli or information. Based on this concept, the idea of individualized "learning styles" originated in the 1970s, and has gained popularity in recent years. It has been proposed that teachers should assess the learning styles of their students and adapt their classroom methods to best fit each student's learning style. The Learning styles were directly aligned to the stages in the cycle and named Activist, Reflector, Theorist and Pragmatist. These are assumed to be acquired preferences that are adaptable, either at will or through changed circumstances, rather than being fixed personality characteristics.

Various researchers have attempted to provide ways in which learning style theory can take effect in the classroom. Two such scholars are Dr. Rita Dunn and Dr. Kenneth Dunn. In their book, Teaching Students Through Their Individual Learning Styles: A Practical Approach, they give a background of how learners are affected by elements of the classroom and follow it with recommendations of how to accommodate students' learning strengths. Dunn and Dunn write that "learners are affected by their: (1) immediate environment (sound, light, temperature, and design); (2) own emotionality (motivation, persistence, responsibility, and need for structure or flexibility); (3) sociological needs (self, pair, peers, team, adult, or varied); and (4) physical needs (perceptual strengths, intake, time, and mobility)."

Kolb's learning theory sets out four distinct learning styles (or preferences), which are based on a four-stage learning cycle. (which might also be interpreted as a 'training cycle'). In this respect Kolb's model is particularly elegant, since it offers both a way to understand individual people's different learning styles, and also an explanation of a cycle of experiential learning that applies to us all. Kolb includes this 'cycle of learning' as a central principle of his experiential learning theory, typically expressed as four-stage cycle of learning, in which 'immediate or concrete experiences' provide a basis for 'observations and reflections'. These 'observations and reflections' are assimilated and distilled into 'abstract concepts' producing new implications for action which can be 'actively tested' in turn creating new experiences.

Kolb says that ideally (and by inference not always) this process represents a learning cycle or spiral where the learner 'touches all the bases', ie., a cycle of experiencing, reflecting, thinking, and acting. Immediate or concrete experiences lead to observations and reflections. These reflections are then assimilated (absorbed and translated) into abstract concepts with implications for action, which the person can actively test and experiment with, which in turn enable the creation of new experiences. Kolb's model therefore works on two levels - a four-stage cycle: Concrete Experience - (CE), Reflective Observation - (RO), Abstract Conceptualization - (AC) and Active Experimentation - (AE) and a four-type definition of learning styles, (each representing the combination of two preferred styles, rather like a two-by-two matrix of the four-stage cycle styles, for which Kolb used the terms:

1. Diverging (CE/RO)
2. Assimilating (AC/RO)
3. Converging (AC/AE)
4. Accommodating (CE/AE)

Divergers tend toward concrete experience and reflective observation. They are imaginative and are good at coming up with ideas and seeing things from different perspectives. *Assimilators* are characterized by abstract conceptualization and reflective observation. They are capable of creating theoretical models by means of inductive reasoning. *Convergers* are characterized by abstract conceptualization and active experimentation. They are good at making practical applications of ideas and using deductive reasoning to solve problems. *Accommodators* use concrete experience and active experimentation. They are good at actively engaging with the world and actually doing things instead of merely reading about and studying them.

NEED AND SIGNIFICANCE OF THE STUDY

Adolescent period is a period of stress and strain, emotional conflicts, value dilemmas etc. In this context it is necessary to solve the conflicts through an effective mode of teaching which can help them to solve the practical socio-emotional problems. A society, which is full of intellectuals but without trained and developed in social and emotional competencies will surely be full of problems. Especially in the case of adolescents a model training strategy for developing social and emotional competencies are very much essential and meaningful. The emotional and social competencies positively directs all people towards better management of life conflicts and solving problems related to themselves and others. This study aims at identifying the learning styles of adolescents and their emotional and social competence to deal with the conflicts and problems related to life through experiential learning.

Several researchers have demonstrated that social status is related to an understanding of emotion. Rubin and Maioni (1975) and Goldman, Corsini, and De Urioste (1980) found that children of higher social status performed better than other children on a task requiring children to match emotional expressions with hypothetical social situations. Gnepp (1989) measured children's ability to use personalized information about others when inferring emotional reactions to emotion-evoking situations; she found that social status was related to the ability to use such information. A study by Field and Walden (1982) of preschool children's ability to imitate and produce basic emotional facial expressions revealed that this ability was related to sociometric ratings. Cassidy also found that children's understanding of emotion across a broad range of dimensions (including the identification, experience, and expression of emotion and knowledge of its antecedents) was related to their social acceptance (Cassidy, Parke, Butkovsky, & Braungart, 1992). Popular children, Dodge, Murphy, and Buchsbaum (1984) found, are better able to detect the social intentions of their peers than are other children. Denham (1986) studied the relationship between preschoolers' emotional understanding and their prosocial behavior when interacting with peers; although she did not measure social status, she found that children with higher levels of emotional understanding behaved more prosocially toward their peers.

Social competence is important for all students because it strongly influences peer acceptance and friendship, which in turn

influence school success and adult outcomes. Students with brain injury often have newly acquired social re-integration problems. These challenges may result from poor general impulse control associated with damage to the under sides of the frontal lobes of the brain. Impulsive students talk out of turn, say things that may be offensive or embarrassing, make sexually inappropriate comments, and the like. Alternatively, students with brain injury may lack initiation and seem socially unengaged (also a frontal lobe problem) – and therefore be left out by other students. Other students may have difficulty correctly "reading" and interpreting social situations, non-verbal cues, and other behaviors of their communication partners (also related to front parts of the brain), resulting in socially awkward responses.

In each of these cases, friendship and peer acceptance are threatened. Unfortunately it is common for students with acquired brain injury to lose the friends they had before the injury and to have a hard time acquiring new friends. Thus, attention to this important domain is critical to the development of social competence.

For making any change, modification or transformation in the field of education we should start from the school education. To give training in any methodology based on the learning styles we have to start the initial preparations and training among students.

OBJECTIVES OF THE STUDY

i) To find out the learning styles of adolescents.

ii) To find out the socio-emotional competencies of adolescents.

iii) To find out the relationship between learning styles and socio-emotional competencies of adolescents.

METHODOLOGY OF THE STUDY

The investigator selected the design for the present study is descriptive survey. 244 students studying in various government, aided and private school were selected for this study.

Tools Used in the Study

The investigator used the following tools during the different phases of the study.(i) Adolescents' Learning Styles Inventory and ii) Socio-Emotional Competency Scale prepared and validated by the investigator.

Sample for the Study

The population for the present study covers all the pupils of Standard Nine of Kottayam District of Kerala state.

Statistical Techniques Used

The statistical techniques used for this study are; mean, standard deviation, and one-way ANOVA.

ANALYSIS AND FINDINGS

Table - 1
Adolescents with different learning styles in relation with their Socio-Emotional Competencies

Learning Styles	N	Mean	SD
Assimilating	68	242.21	20.27
Accommodating	72	245.92	22.10
Converging	56	245.84	22.70
Diverging	48	246.06	16.10
Total	***244***	***245.82***	***20.74***

The first objective was to find out the learning styles of adolescents with respect to the distribution of scores of Socio-Emotional Competencies. From the table values it is interpreted that out of 244 sample selected 68 (27.87%), 72 (29.59%), 56 (22.95%), 48 (19.67%) belongs to Assimilating, Accommodating, Converging and Diverging styles respectively. From

these, students with accommodating learning style are comparatively higher in number in relation with other learning style groups and Diverging group is lower.

Table - 2
The Socio-Emotional Competencies of Adolescents

Socio-Emotional Competencies	N	Mean	SD
Self Awareness	244	24.58	5.82
Self Regulation	244	44.72	11.47
Motivation	244	37.79	8.91
Empathy	244	43.01	10.27
Social Skills	244	95.67	9.43
Socio-Emotional Competencies	***244***	***245.82***	***20.74***

The second objective of the study was to find out the socio-emotional competencies of adolescents. Table II shows that, the mean score of the Socio-Emotional Competencies of adolescents is 245.82 (65% of the maximum score 375), which interprets that these competencies are above average.

Table - 3
Learning styles and socio-emotional competencies of adolescents

Learning Styles and S-E Competencies	Sum of Squares	df	Mean Square	F
Between Groups	1796.863	3	598.954	1.40*
Within Groups	102769.838	240	428.208	
Total	104566.701	243		

*Not Significant at 0.05 level

From table III it is clear that, the F value (1.40) is not significant at 0.05 level. This show, the different learning styles categories are not significantly differ in the socio-emotional competencies.

The major findings of the study are: a) students with Accommodating learning style is comparatively higher in number in relation with other learning style groups; b) Diverging learning style is less preferred by the adolescents: c) the adolescents showed above average Socio-Emotional Competencies; and the different learning styles categories are not significantly differ in the socio-emotional competencies.

EDUCATIONAL IMPLICATIONS

The students can implement and practically use the socio-emotional competencies in their class and daily life through identifying and solving conflicts in life and related issues. Training the students in different learning styles will enhance the affective domain competencies of the future generation through modelling and transfer. Tools constructed can be further used for related studies. Such tools can be widely used in other parts of India to identify the learning styles, socio-emotional competencies, etc., of students of different categories.

The teachers and students can be properly directed towards their own learning styles and they can select the methods according to their style. This will enhance the affective domain competencies especially the emotional and social competencies for better adjustment and for solving the life conflicts. Teachers and pupils work together towards an integrated approach to develop socio-emotional competencies. Teachers and pupils will consciously link these competencies with educational programmes, with home, community, media and other agencies and institutions.

From this study, Diverging learning style is comparatively less, which tend towards concrete experience and reflective

observation. They are imaginative and are good at coming up with ideas and seeing things from different perspectives. This has to be trained more.

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RELATION BETWEEN VERBAL INTELLIGENCE AND CREATIVITY AMONG SECONDARY SCHOOL STUDENTS

Prakash Alex

ABSTRACT

The present study is an attempt to explore the relation between Verbal Intelligence and Creativity among Secondary School students. Survey method was adopted for the collection of data from 600 students. The findings of the present study revealed that there is very close positive relationship between Verbal Intelligence and Creativity. The coefficient of correlation between Creativity and Verbal Intelligence is significant and positive except in the case of relationship between Creativity and Low Verbal Intelligence. In all other cases, it is observed that, with the increase of one variable, there is a corresponding increase of other variable.

Key Terms*:* Verbal Intelligence, Creativity, Elaboration, Sentence Construction, etc.

INTRODUCTION:

Every child is born with innate potentiality to explode, to exhibit his creativity in originality with various degrees. Creativity is a term, generally used to express a unique act on the part of a person. Whatever is novel, unique and unconventional and original has been considered as creative. The ability to produce novel and workable ideas is generally accepted as creativity. It has been recognized as a precious source of emergence, development and survival of man's culture through ages.

Creativity is universal. Every one possesses creative capacity to some degree. It can be viewed as very complex dimensions. Every one possesses creative capacity to some degree. It can be viewed as a very complex dimension covering all aspects of behavior, which will include all the abilities involved in reinterpreting ideas as well as the abilities required in innovating new ideas. Guilford's (1961) view on creativity is "it has been the distinction between abilities for divergent thinking and abilities for convergent thinking. Convergent thinking implies single already ascertained right responses, whereas divergent thinking results in a variety of responses involving fluency, flexibility, originality and elaboration."

Creativity is a multi-splendored thing. It is the ability to encode and decode something new. An individual's potential for being creative is his readiness to produce novel ideas. The characteristics of creativeness are not unique in different subject areas. Whatever may be area, it is accepted that schools should give due importance for the enhancement of creativity from early stages of development.

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In the past, creativity has been tragically neglected by the school and in some instances actively repressed. That means education so far has emphasized only in the area of convergent thinking and rote memory, often at the expense of development in the area of divergent thinking. It always attempted to teach students how to arrive at correct answers, but have not cared to develop the ability to ask intelligent questions and answer them creatively. Bloom (1958) explains "there is some reason to believe that the educational system as it prevails today can reduce originality and creativity. This negative effect on creativity is marked when examinations, instructional material and processes all emphasize learning by rote and the goal is centered on getting through examination."

Today this mentality of school authority has been changed. Now it is the need of the school to make students' divergent thinking creative. Creativity has been recognized as the ultimate answer to mans' problem. National Council for Educational Research and Training recommended that "the child spontaneity, curiosity, creativity and activity in general should not be restricted by rigid and unattractive method of teaching and environment for learning."

Now curriculum constructors realized that creativity has the need of the society, so as to develop and prevail. Creative growth has recently being recognized as an objective of secondary school education. As keeping this in mind, they recommend for providing due weightings for developing creative imagination through discussions, communications, Vocabulary and Grammar learning, Listening, Formal and informal speaking, Humour or jokes, Storytelling, Reading, Writing and Creative writing. These all are possible only through promoting Verbal- Linguistic Intelligence.

It is acknowledged by all teachers that one of the most important single variable which affects Creativity is "Intelligence." Various studies proved the importance of Verbal Intelligence on Creativity. Nair & Sanantharaj (1976), Doutraiaux (1980), Jairal & Sharma (1981), Senapati (1982), Kusuma (2007) and Reddy (2008) suggest that Creativity and Verbal Intelligence varies from student to student. The present study is an attempt to explore the relationship between Verbal Intelligence and Creativity among Secondary School pupils.

The investigator analyzes the six different Tests, which can measures Creativity such as Word Production Test, Use of Things Test, Similarities Test, Sentence Construction Test, Titles Test and Elaboration Test.

OBJECTIVES OF THE STUDY

1. To find out the relationship between Creativity and three levels of Verbal intelligence among Secondary School students.
2. To find out the relationship between three levels of Verbal intelligence among Secondary School students with scores obtained each Creativity tests; such as

a) Word Production Test
b) Use of Things Test
c) Similarities Test (Analogy Test)
d) Sentence Construction Test
e) Titles Test
f) Elaboration Test.

HYPOTHESES OF THE STUDY

H_1: There is significant relationship between Creativity and three levels of

Verbal intelligence among Secondary School students.

H_2: There is significant relationship between three levels of Verbal intelligence among Secondary School students with scores obtained each Creativity tests; such as

a) Word Production Test
b) Use of Things Test
c) Similarities Test (Analogy Test)
d) Sentence Construction Test
e) Titles Test
f) Elaboration Test.

METHODOLOGY

Normative Survey method was used for the study.

The Kerala University Verbal Group Test of Intelligence was administered to 600 students of Standard VIII for measuring Verbal Intelligence. The test consisted of sub tests- Verbal analogy, Verbal classification, Proverbs, Number series and Arithmetic reasoning. The Creativity Tests were also administered to the sample for measuring the Creativity of Secondary school students. The each test consisted of 10 statements, with overall 60 statements. The Tests used here were the Word Production Test, Use of Things Test, Similarities Test (Analogy Test), Sentence Construction Test, Titles Test and Elaboration Test. The data collected were codified and tabulated appropriately and suitable statistical procedures were used for analysis.

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

1. Relationship between Creativity and three levels of Verbal intelligence

The relationship between Creativity and three levels of Verbal intelligence (Low, Average and High) were calculated and are given in Table 1.

Table 1
Relationship between Creativity and three levels of Verbal intelligence

Sl. No.	Variable 1	Variable 2	N	'r'	Level of significance
1.		Low Verbal Intelligence	73	0.06	Not Significant at 0.05 level
2.	**Creativity**	Average Verbal Intelligence	462	0.122	Significant at 0.01 level
3.		High Verbal Intelligence	65	0.33	Significant at 0.01 level

From the Table 1, it is observed that the correlation value between Creativity and Low Verbal Intelligence is 0.06, Creativity and Average Verbal Intelligence is 0.122 and Creativity and High Verbal Intelligence is 0.33. Correlation value between Creativity and Low Verbal Intelligence is 0.06 which is not significant at both 0.05 and 0.01 levels. Other Correlation values are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers and Average achievers in Verbal Intelligence were close positive correlation with Creativity. Thus Hypothesis H_1 is substantiated and accepted.

2. Relationship between three levels of Verbal intelligence with scores obtained to each Creativity tests

The relationship between three levels of Verbal intelligence (Low, Average and High) with scores obtained for each Creativity tests were calculated and are given in Table 2.

Table 2
Relationship between levels of Verbal Intelligence with scores of Creativity tests

Sl. No.	Creativity Tests	Levels of Verbal Intelligence	N	'r'	Level of significance
1.	**Word Production Test**	Low	73	0.05	NS
		Average	462	0.104	0.01 level
		High	65	0.26	0.01 level
2.	**Use of Things Test**	Low	73	0.114	0.01 level
		Average	462	0.136	0.01 level
		High	65	0.185	0.01 level
3.	**Similarities Test (Analogy Test)**	Low	73	0.107	0.01 level
		Average	462	0.27	0.01 level
		High	65	0.38	0.01 level
4.	**Sentence Construction Test**	Low	73	0.04	NS
		Average	462	0.35	0.01 level
		High	65	0.43	0.01 level
5.	**Titles Test**	Low	73	0.06	NS
		Average	462	0.24	0.01 level
		High	65	0.36	0.01 level
6.	**Elaboration Test**	Low	73	0.093	0.05 level
		Average	462	0.131	0.01 level
		High	65	0.27	0.01 level

From the Table 2, it is observed that the Correlation value between Word Production Test and Low Verbal Intelligence is not significant at both 0.05 and 0.01 levels. Other two Correlation values are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers and Average achievers in Verbal Intelligence were close positive correlation with Word Production Test. Thus Hypothesis H_2 is substantiated and accepted.

It is also observed that the Correlation value between Use of Things Test and all levels of Verbal Intelligence are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers, Average achievers and Low achievers in Verbal Intelligence were close positive correlation with Use of Things Test. Thus Hypothesis H_2 is substantiated and accepted.

It is observed that the Correlation value between Analogy Test and all levels of Verbal Intelligence are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers, Average achievers and Low achievers in Verbal Intelligence were close positive correlation with Analogy Test. Thus Hypothesis H_2 is substantiated and accepted.

It is observed that the Correlation value between Sentence Construction Test

and Low Verbal Intelligence is not significant at both 0.05 and 0.01 levels. Other Correlation values are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers and Average achievers in Verbal Intelligence were close positive correlation with Sentence Construction Test. Thus Hypothesis H_2 is substantiated and accepted.

It is observed that the Correlation value between Titles Test and Low Verbal Intelligence is not significant at both 0.05 and 0.01 levels. Other Correlation values are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers and Average achievers in Verbal Intelligence were close positive correlation with Titles Test. Thus Hypothesis H_2 is substantiated and accepted.

It is observed that the Correlation value between Elaboration Test and Low Verbal Intelligence is significant only at 0.05 levels. Other Correlation values are higher than the value of significance at 0.01 levels. Since the obtained correlation values are significant at 0.01 levels, the relationship can be verbally interpreted as moderate. That is; High achievers and Average achievers in Verbal Intelligence were close positive correlation with Elaboration Test. Thus Hypothesis H_2 is substantiated and accepted.

CONCLUSIONS

The coefficient of correlation between Creativity and Verbal Intelligence is significant and positive except in the case of relationship between Creativity and Low Verbal Intelligence. In all other cases, it is observed that, with the increase of one variable, there is a corresponding increase of other variable.

The coefficient of correlation between Word Production Test and Verbal Intelligence is significant and positive except in the case of relationship between Word Production Test and Low Verbal Intelligence. The coefficient of correlation between Use of Things Test and Verbal Intelligence is significant and positive for all levels of Verbal Intelligence. The coefficient of correlation between Analogy Test and Verbal Intelligence is significant and positive for all levels of Verbal Intelligence. The coefficient of correlation between Sentence Construction Test and Verbal Intelligence is significant and positive except in the case of relationship between Sentence Construction Test and Low Verbal Intelligence. The coefficient of correlation between Titles Test and Verbal Intelligence is significant and positive except in the case of relationship between Titles Test and Low Verbal Intelligence. The coefficient of correlation between Elaboration Test and Verbal Intelligence is significant and positive for all levels of Verbal Intelligence. In all other cases, it is observed that, with the increase of one variable, there is a corresponding increase of other variable. These Correlation studies revealed that Verbal Intelligence and Creativity are very close positive relationship.

EDUCATIONAL IMPLICATIONS

As the relationship between Verbal Intelligence and Creativity are closely

related, a few suggestions for improvement of Creativity can be made as follows:

1. Intelligence tests are very helpful in detecting gifted children, backward children and average children. Hence, from the primary school level, Intelligence tests are to be made use of to get a clear picture of the abilities of each pupil.
2. Teachers should create suitable classroom climate for learning and developing better conditions for Creativity.
3. Teachers must develop appropriate teaching styles with sufficient experiences in the classroom to change the perceptions on Creativity. This can be provided in the form of assignments, projects, supplementary educational experiences, co-curricular activities etc.
4. Teachers should prompt the students to use all available resources such as library books, journals; periodicals etc. and encourage the pupil to enhance the embedded Creativity in students.
5. Classroom activities should be organized systematically and learning by doing should be the basic principle of Creativity and teaching and learning.
6. Teachers should accept the child's natural tendency to take a different look at things, respect of unusual questions, imagination, unusual ideas, praise and encourage their ideas, love them and let them know self worth of students.

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PEOPLE WITH DISABILITIES IN HIGHER EDUCATION: EMPLOYABILITY AND CERTAIN ISSUES

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Abstract

Career opportunities come more easily when one has an academic degree. But, for students who have disabilities, completion of higher education is a bigger challenge when their ability to participate and persist is impeded by varying issues and impediments in the system. Expanding, improving, and coordinating educational services and related supports during transition periods for people with disabilities in higher education could increase student progress towards the completion of certificates and degrees, leading to more successful adult life outcomes. Institutions are to take reasonable steps to ensure that students with disability are able to access support services on the same basis as students without disability, and to access specialized support services.

In this paper, the author highlights that infrastructural facilities within institutions, attitude towards persons with disabilities, transportation facilities, and lack of support services are a few areas, which hinder the entry of students with disabilities into higher education (Jameel, 2011) and also women with disabilities have to struggle much harder to accomplish their goal because of societal barriers and prejudices towards people with disabilities (Opini, in press). Proportionately, based on the most conservative estimate for the disabled youth population in the country (National Sample Survey, 2003), at least 31,60,000 disabled youth should be in the Universities and Colleges of India. However, just 1.2% of the 3.6 lakh disabled youth, who should have been studying according to India's norm for the general youth population, are in the Universities and Colleges. Some of the issues focused by the author are related to access to higher education, lack of reasonable accommodation, institutional factors, inadequate infrastructure facilities, lack of knowledge about their rights and services, financial aid issues and so on.

The author also found that, the barriers within higher education that obstruct the progress of students with disabilities towards employment-related realities like; low paying, non-professional jobs, at least one instance of discrimination in the workplace (Stoddard et al., 1998), more restricted participation in community and leisure time activities, more dependency on parents, higher unemployment and poverty levels than the rest of society and so on. In the concluding part, the author has given some valuable suggestions to tackle the issues faced by students with disabilities at higher education like; register of organized data and information on disability supports and services, Accessible Infrastructure, Universal Designs and Assistive Technologies, Flexibility in financial aid, Comprehensive and Accessible Information and so on.

***Key Words**:* Reasonable Accommodation, Financial Aid Issues, Universal Designs and Assistive Technologies.

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Introduction

Disability in higher education has different implications from that of school Education. Higher education increases the chance of employability, thus, affirming dignified life for the persons with disabilities. While going through the policies and programmes in India it is found that not much has been done in the field of disability and higher education. There are number of groups working on the school education of children with disabilities. This has not translated in the entry of students to higher education because of various reasons. *Infrastructural facilities within institutions, attitude towards persons with disabilities, transportation facilities, and lack of support services are a few areas, which hinder the entry of students with disabilities into higher education* (Jameel, 2011). The students' also encounter several practical problems in their education, including a *lack of understanding and cooperation from administrators, faculty staff and lecturers, a lack of adaptive aids and other resources and inaccessibility of grounds and buildings* (Reindal, 1995). The perceived attitudes of the academic staff towards people with disabilities, and their knowledge and awareness about disability issues may negatively impact the accommodation of students with disabilities in general and women with disabilities in particular in the higher education (Mayat and Ladele, 2011).

Women with Disabilities and Higher Education

Need to become economically independent, the desire to become a 'somebody', and the determination to challenge their subjugated position in society with a view to rising above the prejudiced notions of 'lack', is central to the women's motivation to attend university. While some of the motivations of women with disabilities to go to university are similar to those of non-disabled individuals, women with disabilities have to struggle much harder to accomplish their goal because of societal barriers and prejudices towards people with disabilities (Opini, in press).

According to the new World Report on Disability (WHO, 2011), "Women with disabilities experience gender discrimination, culture, social structure as well as poverty barriers". The study of Haldar (2009) on the prospects of higher education for challenged women in India found that the *physical or architectural barriers, financial constraints and the attitudinal barriers have a significant influence on higher education of the challenged woman*. Studies in Tanzania indicated that women with disabilities have not had equal access to education compared to males. It was found that more effort should be put toward shaping the lived experiences of disabled women in higher education and identifies six key issues which are applicable to the disabled women globally in the education field that should be given more attention (Matonya, 2012).

1) Accessibility to new technology was the key necessity mentioned by disabled women.
2) Disabled women need encouraging and interactive classroom teaching and learning.
3) Commitment by the university to facilitate barrier free curriculum, infrastructures and to develop effective support services as well as openness towards their rights.
4) Commitments from the university to organize community awareness training for the attitudinal change towards disabled women.

5) Parents and family should create effective and appropriate environment towards their education and.
6) The university should organize a pre-induction course for the incoming students. However, the supports they needed vary based upon the type of disabilities, to the next depending on the prevalence of the disability within the community and its impact on education.

Current Status of Disabled Youth at Higher Education in India

India has the third largest higher education system in the world- after China and the U.S.A. There has been an impressive growth of Universities (from 25 to 544), Colleges (from 700 to 31,324) and students (from 1 lakh to 146.25 lakh) in the last five decades but according to the National Sample Survey 2003, 55% of persons with special needs were illiterate and only 9% had completed higher secondary education. Further, only 7 per in the rural areas and 18 percent in the urban areas have obtained education of secondary level or above. According to the University Grants Commission (UGC), 6% of India's youth population is in Universities and Colleges. Proportionately, based on the most conservative estimate for the disabled youth population in the country (National Sample Survey, 2003), at least 31,60,000 disabled youth should be in the Universities and Colleges of India. However, just 1.2% of the 3.6 lakh disabled youth, who should have been studying according to India's norm for the general youth population, are in the Universities and Colleges. It brings the stark reality into an established truth that India's higher educational system is not accessible to 98.8% of its disabled youth. Therefore there is an urgent need to look forward towards this situation (Sharma, 2012).

Higher Education and Employability of People with Disabilities

Without access to higher education, youth with disabilities find restricted opportunities for meaningful employment and are therefore denied the higher standard of living that greater numbers of their non-disabled peers enjoy. The barriers within higher education that obstruct the progress of students with disabilities bring about the following employment-related realities irrespective of nations:

Young disabled people have fewer chances than non-disabled youth to enter and progress within higher education. They are less likely to enroll in professionally promising courses or to graduate, and they are more likely to drop out after the first year and to have erratic and longer pathways within higher education. Individuals with disabilities are more than twice as likely to live below the poverty line as individuals without disabilities. The employment rates for individuals with cognitive impairments and significant disabilities are even lower (Kiernan, 2002). Of those people with disabilities who are employed, less than one percent are professionals. Instead, the vast majority of individuals with disabilities who are employed work at *low paying, non-professional jobs* which require no higher education, are associated with less prestige, and provide no security, room for advancement, or significant medical/ retirement benefits (Stoddard, Jans, Ripple, & Krauss, 1998). *36% of employed people with disabilities report encountering at least one instance of discrimination in the workplace due to their disabilities* (National Organization on Disability, 2000).

Access to employment is challenging for young disabled people compared to non-disabled youth. Their employment rate tends

to be much lower and they are over-exposed to unemployment and to exclusion from the labour market. Those accessing employment have more precarious and part-time jobs than the general population and may therefore be at risk of poverty. These challenges tend to be particularly strong for youth with cognitive impairments, with multiple impairments or with mental health conditions. Teachers with dyslexia can be successful and useful in training fellow practitioners to be more aware of students' difficulties with dyslexia, hence having the potential to broaden capacity for inclusion and social equality in educational establishments. But, fewer individuals with disabilities are employed when compared with those people without disabilities (Burns and Bells, 2010).

Furthermore, individuals with disabilities who do not have a college degree are significantly less likely to own a computer or reap the professional and social benefits of electronic "networking" than individuals with disabilities who have graduated from college. Assistive technology is an important tool for overcoming disability-related obstacles while computer access helps students learn about self-advocacy and their rights in the higher education setting. Individuals with disabilities who do not obtain a college degree or a certificate of completion of advanced education are known to show *more restricted participation in community and leisure time activities, more dependency on parents* and central and state cash transfer programs, and significantly lower rates of home ownership (Turnbull, Turnbull, Wehmeyer, & Park, 2003). Stodden and Dowrick (2000) explain that a college education is crucial for qualified people with disabilities because their employment options are much less without an education. People with disabilities face much *higher unemployment and poverty levels than the rest of society*, and Stodden (1998) found that poverty levels for college-educated people with disabilities is 15 percent, compared to 50 percent for people with disabilities who dropped out of high school. However, people with disabilities have much more difficulty gaining access to higher education than do non-disabled people, according to the National Organization on Disability (1998).

Career opportunities come more easily when one has an academic degree. But for students who have disabilities, completion of higher education is a bigger challenge when their ability to participate and persist is impeded by varying issues and impediments in the system. Many educational programs require students to spend a period of time in an internship or practicum to obtain their bachelor's degree. However, because of the lack of integration and other issues, students may decide not to pursue such courses of action. Likewise, their choice not to participate in any of these academic activities prevents them from building social networks in the community essential in achieving employment in the future.

Many of the negative outcomes for youth with disabilities described above are the result of problems that have been ongoing and compounding for decades. Serious gaps remain in the services and supports provided to this population. It is not through lack of effort on the part of policy makers, advocates and people with disabilities that this is so. Innumerable issues must be examined to fully understand what is preventing our efforts to move forward and produce results in a timelier manner. Careful consideration must be given to the barriers students with disabilities face as they transit to and through the environments

related to education. It is also important to understand how these settings connect, or fail to connect, and exactly how inadequately addressed issues in childhood build upon each other and present even greater challenges at the higher education level.

Issues of People with Disabilities at Higher Education

Barriers exist for people with disabilities in both school and higher educational settings, as well as in the provision of government-funded support services. Progress has often been far too slow, hindered by systemic structural and pedagogical obstacles. There has been consistent but limited progress over the past decade for youth with disabilities. Current practices and policies continue to hinder the progress of students with disabilities as they seek to access, persist in, and complete their education in secondary and postsecondary settings. These problems include: *discrepancies in service delivery modules and terminologies; lack of interagency collaboration, and inadequate funding for resources and staff development.* Ultimately, student employment opportunities are limited. The issues below are presented in detail to facilitate and lend clarity of vision to efforts to revolutionize the outcomes for youth with disabilities in higher education globally.

1) ***Access to Higher Education:*** Education is the key factor in achieving employment and thus an enhanced quality of life for people with disabilities. The right of entry or access which is defined in the Oxford Dictionary (1996) as the "right or opportunity to reach, or enter, or visit" to higher education is wrought with barriers for youth with disabilities. One of the problematic areas encompassed is *preparation for and transition to higher education programs.* Critical components to higher education access are the skills of *self-determination and self-advocacy*. Efforts have been made over the years to teach youth with disabilities these skills of decision-making, problem-solving, goal-setting, attainment, and leadership based on teacher interpretation of self-determination. Rather, these efforts should be based on providing real, authentic opportunities to make decisions and accept consequences (Brinckerhoff, 1994; Izzo and Lamb, 2002). Without the skills of self-advocacy and self-determination, students with disabilities seeking secondary education will find this an extremely difficult goal to achieve.

2) ***Preparation for Higher Education:*** In order to access higher education, students with disabilities must first successfully complete a recognized program of academic study in secondary and higher secondary education. During secondary school, the emphasis is often on providing youth with disabilities with prescriptive, specialized services and supports focused specifically upon remediating learning or behavior deficits experienced by the student. Students with disabilities are often not active participants in the decision making process around the determination of their supports (Abery & Stancliffe, 1996). They often leave secondary school without advocacy skills and without knowledge of the impact that their disability has upon their learning or of the related modes of assistance which can help mitigate this impact. Furthermore, they are without an understanding of how to negotiate postsecondary settings, where

the focus is on providing "reasonable accommodations" rather than on detailing services focused upon meeting individual needs (Stodden, Conway, & Chang, 2003; NCSPES, 2002). Therefore, students with disabilities are leaving the secondary education setting without the essential skills of access to higher education i.e. self-determination and self-advocacy.

3) ***Institutional Factors***: This problem of preparation is exacerbated by other institutional factors which include problems with *disability identification in secondary institutions* (Thurlow, 2001), poor use and application of promising technology (Burgstahler, 2002), poor coordination and management of supports and services (Whelley, Hart, & Zafft, 2002) and *lack of clarity among professionals and families about the necessary supports and accommodations to provide* (Stodden et al., 2003).

4) ***Lack of Skills for Career Counselors:*** Furthermore, many academic and career counselors lack the necessary skills to provide guidance to students with disabilities. State-standard based curricula and assessment measures that are designed without input from special educators are likely to needlessly increase challenges to students with disabilities and their teachers (Stodden, Galloway, Stodden, 2003).

5) ***Lack of Knowledge about their Rights and Services***: The lack of knowledge about differences in their rights, services, and funding has the effect of discouraging or possibly even barring students with disabilities from higher education. Moreover, there are no current mandates regarding what kinds of accommodations should be provided, where and by whom, and no minimum standards of support provision. As a consequence, *institutional drawbacks have a major impact on the quality of performance in the progress and achievement of people with disabilities.*

6) ***Lack of Skills in Self-Advocacy and Determination***: For most students with disabilities, however, the concerns amplify as issues surrounding their probable lack of skills in self-advocacy and determination, social life needs, availability of educational assistance, differences in academic requirements, and limited preparation to postsecondary education become a primary pre-occupation (Burgstahler, Crawford, & Acosta, 2001). Background characteristics associated with their socio-economic status, financial factors, race, availability of supports, parental background, and distance from their school are often involved.

7) ***Limited Availability of Educational and Related Supports***: One factor affecting participation of people in higher education is the limited availability of educational and related supports within academic institutions. Once a student enters higher education, the lack of student input and selective emphases in servicing students may leave disabled students at a disadvantage in exercising self-advocacy skills. The lack of consensus on the nature of supports to be provided can be difficult for staff as well as for students who seek accurate and complete information to determine which institutions and organizations are best prepared to meet their needs.

8) ***Inadequate Infrastructure Facilities***: The concept of retention and persistence is based on continued student

attendance in the class and consistent progress in class hours, declaration of a major, and their progression toward desired goals. Although the ultimate goal for many students is to complete higher education, success becomes problematic when the basic infrastructure and services are limited or not available like *ramps, toilets, accessible libraries, rest rooms etc. and transport facilities including access paths, manoeuvrings areas, ramps and boarding devices, allocated spaces, handrails, doorways, controls, symbols and signs, the payment of fares, the provision of information etc.*

9) ***Lack of Reasonable Accommodation***: *Equal access and reasonable accommodations* are still an issue for individuals with disabilities attempting to persist in higher education, and often the most basic needs pertaining to their activities of daily living, including physical access, are unmet. Without the proper accommodations, students with disabilities fail to participate in many internships and academic activities required for completion of their studies.

10) ***Inadequate Resources***: Resources are often inadequate and disconnected. The type, range, availability of, and terms related to services are often widely discrepant and poorly integrated while access to mentors or technological training is either limited or non existent (Stodden, Jones & Chang, 2002).

11) ***Support Services are not Student Specific***: Educational supports and services are rarely individualized according to a student's needs, and more often supports are offered as a menu of programs, associated with disability type, rather than being student specific. Most of the support systems are not individualized to meet the unique needs of disabled students

12) ***Limited Awareness of Available Services***: The services and auxiliary aids offered range from *sign language interpreters, assistive technological listening systems, captioning, readers, audio recordings, taped texts, brailed materials, adapted computer terminals,* and more. Yet, evidence suggests that students with disabilities are unaware of the availability of services, and do not access them. In the case of technological supports, the lack of proximity or the individualized configurations and accommodations needed make utilization of the technology impractical or unfeasible. Furthermore, they also may be limited in number or availability, as are sign language interpreters (NCSPES, 2002).

13) ***Conflicts in Understanding Disabled Students***: The limited awareness of the needs of people with disabilities prevents staff members and other academic personnel from providing the most suitable approach to enhancing the access and ability of students to learn. Moreover, the lack of proper background in managing students with disabilities needs may invite further misunderstanding, conflict and eventually lead to students dropping out. One reason for this lack of knowledge is the absence of training on the part of the staff members. What is reflective of these institutional shortcomings is the negative effect on the self esteem of students with disabilities and found that students with disabilities markedly "rate themselves lower in measures of self-esteem, emotional health, and academic or physical ability" (Izzo & Lamb, 2002; Martin and Huber-Marshall, 1995; Wehmeyer, 1998).

14) Financial Aid Issues: Education is an expensive proposition for any student involved in higher education. The cost of higher education is an increasingly expensive proposition and has infact become too burdensome for most students and their families to handle without the procurement of financial aid in the form of scholarships, grants, or loans. Cost presents a major barrier to students with special needs in their quest to complete higher education. Time is a factor because the extended period necessary for some students with disabilities to complete their degree adversely affects the final cost of their education and delays the start of their wage-earning years. The ability of many highly qualified students with disabilities to access and pursue their studies hinges on their ability to finance themselves through the completion of a degree in a college or university. The cost of higher education and various services and supports limit their access to advanced studies. In addition, campuses also may be unwilling or unable to make job accommodations that enable students with disabilities to participate in work-study or other forms of university or college employment.

Expanding, improving, and coordinating educational services and related supports during transition periods for people with disabilities in higher education could increase student progress toward the completion of certificates and degrees, leading to more successful adult life outcomes. Also, not all instructors are currently benefiting from adequate in-service training in information and assistive technologies that would enable them to render their curricula and classrooms more accessible to students with disabilities. Moreover, increasing awareness of the many financial, bureaucratic and personal barriers presented to students with disabilities as they pursue higher education would doubtlessly help faculty to offer appropriate accommodations and, ultimately, play a stronger role in the success of all their students.

Suggestions to Tackle the Issues

The value of a higher education to youth with disabilities cannot be over-stated. When this population is not supported through policies that enhance its chances for success in college and professional employment, the cost to the nation is likely to be higher. This is so because of the supplemental and/or dependent support they may require from others, and the likelihood that they will need to take out extra student loans to manage additional costs associated with their disabilities. Yet, the quality of life for individuals with disabilities is improved dramatically through increased participation in *meaningful employment, community involvement and social acceptance.* However, for individuals who do not obtain a higher education, prospects for finding meaningful and remunerative employment are increasingly limited and their prospects can be enhanced by focusing on certain aspects like:

Improving access to higher education by providing information on higher educational support provision: A national Web-based Assessment Center and Register of organized data and information on disability supports and services is recommended to enable students and families to better anticipate what supports and services will be needed, and whether they are available, in higher education.

Addressing emerging needs through targeted personnel preparation and research: Higher education personnel preparation should include research and training on disability-related supports and services and should emphasize recruiting,

educating and providing accommodations to teachers with disabilities.

Technical assistance centers: A national network of technical assistance centers should be established to assist faculty and disability support programs in higher education settings, and to provide effective practice models, training of faculty and support personnel, and technical assistance to programs and people with disabilities.

Accessible Infrastructure: Basic infrastructure and services like ramps, toilets, accessible libraries, rest rooms, transport facilities including access paths, maneuverings areas, ramps and boarding devices, allocated spaces, handrails, doorways, controls, symbols and signs, the payment of fares, the provision of information etc. are a must in every institute of higher education.

Universal Designs and Assistive Technologies: Universal Designs encourages multiple means of representation, expression and engagement at all levels of the course; be it instruction, resources or evaluation whereas, assistive technology enable easy and affordable access which includes motorized wheelchairs, JAWS, hearing aids, phones for the hearing impaired, large screen monitors with magnifiers, Braille readers, close captioning and the like that enable people with disability to perform functions that might otherwise be difficult or impossible.

Flexibility in financial aid: Improving Financial Aid for People with Disabilities in higher education with new flexibility is necessary. Amendments to the existing Act are needed to remove barriers to financial aid for students with disabilities and to provide funds for research, demonstrations, and training on disability-related financial aid issues (Lex Frieden, 2003).

Comprehensive and Accessible Information: The mismatch of disability needs and supports provided is a major contributor to failure and lack of persistence by people with disabilities in higher education. In order to better prepare families and students with disabilities for higher education, is essential.

Better training and Support: Instructors, counselors, financial aid advisors, and other agency and institutional support staff are in need of better training and support to address the needs of students with disabilities before and during their higher education years.

Evidence Based Curricula: As for teacher preparation, institutions which offer teacher training programs should require that all future teachers be trained in evidence-based curricula, including differentiated teaching methods which have successfully addressed the needs of students with disabilities.

Longitudinal Studies Needed for Gathering Data: Evidence based research be conducted to provide a comprehensive foundation of knowledge from which evidence-based strategies may be determined. The study of people with disabilities and their transition to and status in higher education is a fairly recent area of investigation; thus, large gaps in the knowledge base exist. A National Longitudinal Transitional Study is needed to gather data on and directly from people with disabilities as they: prepare for higher education; access and transition to higher education; participate and persist at the college and university level; and complete higher education in preparation for professional employment. Such a study must be comprehensive and focus upon critical gaps in the knowledge base. Both primary and secondary analysis of data collected should take place to fully inform all stakeholders and direct future evidence-based practices.

Equality of opportunity, full participation, and economic self-sufficiency—directly hinge on removing barriers to employment for people with disabilities, on enabling more of those who are able to work to find or retain mainstream jobs that provide a decent living.

Concluding Remarks

There is much that we all can do to promote an inclusive approach to service provision that can minimize the need for individual support for students with disability while enhancing the learning of all students. Institutions are to take reasonable steps to ensure that students with disability are able to access support services on the same basis as students without disability, and to access specialized support services. Specifically, universities must ensure that: staff members are aware of the specialized services available and are able to assist students access them; specialized services, which are necessary, are provided in collaboration with specialist service providers; any required specialist equipment is provided and trained support staff, interpreters, note-takers, aides - are available for students with disability.

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BLENDED LEARNING STRATEGY AND ACHIEVEMENT IN BIOLOGY

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Abstract

This paper examines the effectiveness of Blended Learning strategy on the achievement in Biology among the students at secondary level. It uses an experimental method to carry out the study. The sample consists of 60 students from Holy Family High School, Kottayam. Out of this 30 students were in the experimental group and the rest were in the control group. Achievement test in Biology, Lesson Transcripts based on Blended Learning Strategy and Lesson Transcripts based on Activity oriented method were the tools used for the collection of data. The collected data would be analyzed by using the statistical procedures such as Mean, Standard Deviation and ANCOVA. The difference between the adjusted means of post-test scores of pupils in the experimental and control group are significant. The obtained t value is 6.92 which is significant at 0.01 level (t= 6.92, P<0.01). So the result indicates that Blended Learning strategy is more effective than Activity oriented method.

Keywords: *Blended Learning, e-learning, Information Technology, Achievement, Communication Technology, etc.*

Introduction

Today, Information Technology plays an important part in the education industry. Education is an important factor that reflects the personality of the individual person in our society. That is why effective way of teaching is the best solution in giving the quality of education. With the use of Information Technologies, quality of education becomes possible. The fastest way of teaching is said to be possible through the use of different technologies in the school. Using high and advanced technologies in the schools can contribute a big help to the students and teachers. The students can easily catch and update the lesson if they have copies of what the teacher is discussing about. Technologies also serve as a reference to the students in searching and discovering other knowledge and ideas through the use of Internet.

E-learning refers to the use of electronic media and information and communication technologies (ICT) in education. E-learning includes numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based

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learning, as well as local intranet/extranet and web-based learning. E-learning can occur in or out of the classroom. It can be self-paced, asynchronous learning or synchronous learning. E-learning is suited to distance learning and flexible learning, but it can also be used in conjunction with face-to-face teaching, in which case the term Blended Learning is commonly used.

The rapid growth in the application of computer technology in education has expanded the possibilities for experimentation in the design of learning situations. Both traditional and computer-based approaches have their place. Computer driven technology in education to this point often lacks the human element that comes from face to face interaction .On the other hand traditional approaches are often inflexible and restrictive in terms of timing and location.

"Blended Learning is a mix of delivery methods that have been selected and fashioned to accommodate the various learning needs of a diverse audience in a variety of subjects. This method can include any combination of any of the above delivery methods" (McSporran & King 2005).

Need and significance of the study

Blended Learning includes combination such as Blending online instruction with access to a coach or faculty member. It combines face to face classroom methods with computer mediated activity. Educators seem to have the most interest in Blended Learning, for obvious reasons. Because of this, much of the research on Blended Learning has been based around classroom situation. All levels of education have been researched with Blended Learning, from the elementary school grades up to graduate school. Educator's interest in Blended Learning is best summarized by Slavin in his E-learning advantages in a tough economy. One of the clear significances of Blended Learning in education is connected with differentiated instruction. Another significance of Blended Learning is pacing and attendance. In most Blended Learning classrooms, there is the ability to study whenever the students choose to do so.

The self pacing allows for the engagement of every learner in the classroom at any given time. Students also see that the learning involvement becomes a process, not individual learning events. This revelation allows for an increased application of the learning done in the classroom. When teachers begin to explore Blended Learning and the resources that can be found through the internet and other technologies, it is possible to structure their classroom in a way that best suits their learning style and their students learning style.

As stated above Blended Learning should provide students and teachers with the best of teaching and learning. But some teachers who were teaching for numerous years may be stuck in their traditional teaching methods because of their lack of knowledge in computer technology. So teachers must be trained to use some type of technology in the classroom. The teachers may use a variety of teaching styles, but without technology the students are being cheated out of what they need to be successful in today's world. Proper teacher training is the only way teachers and students will get the best of teaching and learning. Boyle, T. et al, (2003) conducted a study on **"**Using Blended Learning to improve student success rates in learning to program". The aim of this study was to improve student success rates in learning to program. The project team introduced a number of changes

in module organization, tutorial support and online resources. The blend represents a mixture of traditional and novel elements, with the novel elements more marked in the online developments. Results of the study pointed out improvements in student's success rate and static graphic representational teaching of the same courses content in an online learning environment.

Cameron. (2003) investigated on "The effectiveness of simulation in a hybrid and online networking course". This research compared students' performance on simulation-based courses. It is indicated that interactive learning tools, such as simulation, have the potential to increase student motivation and learning in an online environment. Owing to web enhanced communication systems and newer formats of media, various innovative instructional methods have provided learning solutions meeting the diverse needs of instructors and learners in schools and private organizations. A major concern in adopting the new technologies is whether or not educators utilize new technologies for the convenience and efficiency in the delivery of educational content. Newer ways to blend traditional instruction with technology mediated instructional methods have emerged in an effort to meet the diverse needs of learner satisfaction and improve their learning levels. These observations prompted the investigator to carry out the study relating to the areas of Blended Learning. Hence the investigator proposed to determine the "Effectiveness of Blended Learning Strategy on Achievement of Biology at Secondary Level".

Objectives of the Study

1. To compare the effectiveness of Blended Learning with that of Activity Oriented Method on Achievement in Biology of secondary school students.

Hypothesis of the Study

There is no significant difference on Achievement in Biology among secondary school students taught through Blended Learning strategy and Activity Oriented Method.

Methodology

The study was intended to check the effectiveness of Blended Learning on the achievement of secondary school students in biology. It was decided to conduct the study in Standard VIII. The investigator selected boys and girls of aided school in urban area of standard VIII classes from Holy Family High School Kottayam to conduct the study. There were total of 60 students in the selected classes. Out of this 30 students were in the experimental group and 30 students were in the control group. The design selected was pre-test post- test non equivalent group design Best, (2004). Pre-test will be given to all pupils. The experimental group, consisting of 30 students will be given the experimental treatment. The control group consisting of 30 will be taught on the basis of activity oriented Method and later the post-test will be administered to all the pupils. The dependent variable of the present study is "Achievement in Biology" of students. The following tools and materials are employed for the collection of data.

1. Lesson transcripts based on Blended Learning strategy: Here the investigator includes some techniques like Blending online instruction with access to a coach or faculty member, Blending classroom instruction with online instruction, Video – based learning, Radio Lessons, Online submission of assignments,

Discussion Board, Digital – based Learning, Puzzle Sheet, Animation, Module, PowerPoint Presentation, Screen Casting.

2. Lesson transcripts based on Activity oriented method.
3. Achievement test in biology prepared by the investigator.

The collected data would be analyzed by using statistical techniques such as mean, standard deviation, t – test, and ANCOVA.

Analysis and Discussion

1. Comparison of the Effectiveness of Blended Learning strategy Over Activity oriented method Based on Pre test, Post test Scores Using ANCOVA

The scores of Experimental and Control groups were subjected to Analysis of Covariance to determine the effectiveness of the model over present method. Total sum of squares, mean square variance and F-ratio for pre-test and post test scores of the Experimental and Control groups were computed.

Table 1
Summary of Ancova of Pre Test and Post Test Scores of Pupils in the Experimental and Control Groups

Source of variation	df	SSx	SSy	SSxy	SSyx	MSy.x(Vyx)	SDyx
Between means	1.00	10.42	1033.4	103.75	898.45	898.45	4.35
Within groups	57.00	1539.23	1709.6	987.4	1076.23	18.88	

The F-ratio for the two sets of scores was tested for significance. The table value of F for df (1,58)are 4.00 at 0.05 level and 7.08 at 0.01 level. The obtained value of Fx is 0.29. which is not significant at 0.05 level (Fx = 0.39, P>0.05). The obtained value of Fy is 38.45,. which is significant at 0.01 level (Fy = 35.06 , P<0.01). So it can be tentatively concluded that there is significant difference between the post-test means of the two groups.

The obtained value of Fyx ratio was tested for significance. Since the table value of F-ratio for df (1, 57) is 7.08 at 0.01 level, the obtained Fy.x ratio is significant (Fy.x = 47.58., P<0.01). It is clear from this, that the final means which depend upon the experimental and control variables differ significantly after they have been adjusted for initial differences on x.

The adjusted means of post-test scores (y means) of pupils in the experimental and control groups were computed. The difference between the adjusted y means was tested for significance. The data for adjusted means for post-test score of pupils in Experimental and Control groups are given in Table 2.

Table 2
Data for Adjusted Means of Post Test Scores of Pupils in Experimental and Control Groups

Group	N	Mx	My	Myx (adjusted)
Experimental	30.00	15.57	27.5	27.20
Control	30.00	14.73	19.2	19.43
General means	60.00	15.15	23.32	-

S_{Em}=1.12
t value = 6.92
S_{Em} between adjusted mean is 1.12
Calculated value of t = 6.92
From the table for df 57
t at 0.05 level = 2.00 t at 0.01 level = 2.66

The adjusted means of post test scores of the pupils in the experimental and control groups are 27.2 and 19.43 respectively.

The obtained t=6.92 which is significant at 0.01 level (t =6.92, P<0.01).

So the differences between the performances of the two groups differ significantly. So it is clear that Blended Learning strategy is better than activity oriented method.

Cox, Carr, & Hall. (2004) were investigated a study on "Evaluating the use of synchronous communication in two blended courses". This article evaluates the educational effectiveness of online chats, considering the roles of course design, group dynamics and facilitation style. Results found that these three factors strongly influenced the successful use of this medium and student participation. Douglas. (2012) examined a study on "Comparing Student Outcomes in Blended and Face-to-Face Courses". This article reported a study of student out comes in a pair of matched cources, one taught face to face and one taught in a Blended Learning format. The findings of this study revealed that the students completed most of their work through Blended Learning strategy but met several times face to face.

The findings of the above studies strongly support the inference of the present study. So it can be concluded that Blended Learning strategy is more effective than Activity oriented method on Achievement in Biology of Secondary School level.

Educational Implications of the Study

Blended Learning strategy is very effective in enhancing achievement in Biology among secondary school students. The study concluded that the Blended Learning strategy is more effective than the Activity oriented Method. The findings of the study throw light in to the following educational implications.

1. The application of Blended Learning strategy on teaching should be encouraged among teachers since the above strategy proved itself to be more effective than Activity oriented method
2. In Blended Learning students have to shoulder responsibility of their own learning. Hence they will be more vigilant to understand the concepts of subject matter clearly which in turn enhance their Achievement.
3. In Blended Learning, the students are not just learning the subject matter they have chosen to study. They are also strengthening character and developing their ability to learn.
4. Blended Learning is compatible with any and all instructional methodologies.
5. The Blended Learning inculcates the skills for independent learning in future .It uses interpersonal skills not just for a job but for lifelong living and learning, and commitment for making a better society.

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EMOTIONAL INTELLIGENCE AND VALUING COMPETENCIES OF SECONDARY SCHOOL STUDENTS

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Abstract

Modern age of Science and Technology has created certain trends like industrialism, mechanism and materialism. In-spite of wonderful scientific achievements, the world is a place of violence, gloom and unease. Such unsatisfactory situations have arisen due to crises of values and character. If a nation is to be strong, then the character of the people of that nation needs to be elevated. It can be achieved through the inculcation of values in the process of education. Schools not only make children competent in mathematics, languages, and environmental consciousness but also to teach how to manage themselves better, how to handle other people, how to co-operate, how to get along, how to solve problems of meaning and value and so on. It is the duty of the school to develop Emotional Intelligence and valuing competencies. Education for promoting Emotional Intelligence and Valuing competencies are recognized as an essential element of the educational process in the classroom. With this in view, the present study aims at determining the level of Emotional Intelligence and Valuing Competencies of Secondary School Students in Pathanamthitta district. The major findings are a) male, urban and aided school school students are higher in emotional intelligence than female, rural and private school students b) male and urban school students are higher in valuing competencies than female and rural students c) aided and private school students are equal in valuing competencies. The study reveals that adequate training is needed to develop emotional intelligence and valuing competencies of students for the better adjustment.

Key Words: *Emotional Intelligence, Valuing Competencies, Choosing, Prizing, Acting, etc.*

Introduction

Education in ancient India aimed at the following:

"Sarve bhavantu, Sukhinah, Sarve santu niramaya, Sarve bhadrani pashyahtu, Ma kaschit dukhabhay bhavet.

Let all be happy and healthy,

Let all be courteous and gentle, and

Let nobody feel the pinch of sorrow

Education has a very important role in human life. The process of acquiring education continues throughout the human

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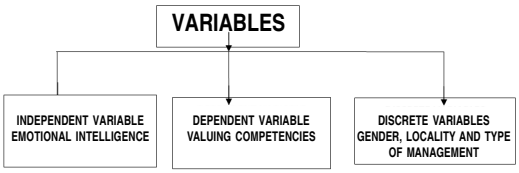
life. The garden of life will be colorless and without fragrance in the absence of education. God created the human being strong, intelligent, right and beautiful. The word education has a very wide connotation and it is very difficult to give a precise definition of it. Man is an individual born with certain innate potentialities, talents and inherent powers. Education provides opportunities to develop these inborn potentialities. The main function of education is the development of an all-round and well-balanced personality of the students. School should give more emphasis to develop different aspects of their personality like physical, emotional, social and spiritual, for the growth of attitudes, habits, values, skills and interests.

Variables

The following variables are used in the study:



Emotional intelligence is the capacity for reorganizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in us and in our relationships. It is the ability to perceive accurately appraise and express emotions, generate feelings that facilitate thoughts and an ability to regulate emotions to promote growth". Daniel Goleman (1995) defined Emotional intelligence as follows: "It is the capacity for reorganizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in us and in our relationships." Goleman identified the following major areas of EQ skills

- Knowing one's emotions
- Management of emotions
- Motivating oneself
- Recognizing and understanding other people's emotions.
- Handling relationships.

Valuing Competencies are the skills, which we use, in the valuing process. Valuing is the tendency of a person to show preference. Valuing is a process, which is gradual and steady, it is a process where in an individual prizes and esteems a principle dearly. Kirschenbaum (1973) Valuing as "a process by which we increase the likelihood that our living in general or decision in particular will first have positive value for us, and second be constructive in the social context". The process of valuing is what we go through when we make judgement about things, events and people that we encounter in our day to day life. In valuing process, a principle is prized, held in respect, deemed worthy, esteemed and proclaimed.

Emotional Intelligence is used to manage and take responsibility for one's own emotions. *Valuing Competencies* is used to choose the right values in accordance with one's conception of highest ideals of life. Emotional Intelligence plays a significant role which helps an individual to develop valuing competencies. The present study is entitled as "Emotional Intelligence and Valuing Competencies of secondary school students."

Need and Significance of the Study

In-spite of wonderful scientific achievements, the world is a place of

violence, frustration, immorality, self-centeredness, gloom and unease. As a result of this, man is not happy and contented. Such unsatisfactory situations have arisen due to crises of values and character. There is no harmony between the inner and outer self, between the men and between one place and another.

The present educational system, with all its complexities has proved to be deficient in so far as it neglects or does not give the deserving importance to values in human life. Our country is undergoing radical social changes. So the students who are the future citizens have to be trained to respond to and adjust with these social changes satisfactorily by equipping them with desirable skills and valuing competencies which help them to face and choose the correct values in the conflicting situations of life. Schools not only make children competent in mathematics, languages, and environmental consciousness but also to teach how to manage themselves better, how to handle their rocky emotions, how to handle other people, how to co-operate, how to get along, how to handle vicissitudes of life, how to solve problems of meaning and value and so on. It is the duty of the school to develop Emotional Intelligence and Valuing Competencies.

Education for promoting Emotional Intelligence and Valuing competencies are recognized as an essential element of the educational process in the classroom. With this in view, the present study aims at determining the level of Emotional Intelligence and Valuing Competencies of Secondary School Students in Pathanamthitta district. For making this study a comprehensive one, the investigator undertakes the variable related to gender, locality and type of Institution.

The Present study focuses to find out the Emotional Intelligence and Valuing Competencies of Secondary School Students and also to find out the relation between Emotional Intelligence and Valuing Competencies.

Objectives

1. To find out the Emotional Intelligence and Valuing Competencies of Secondary School Students.
2. To study the significant difference in the Emotional Intelligence and Valuing Competencies of Secondary School Students based on Gender, Locality, and Type of Institution.
3. To find out the relationship between Emotional Intelligence and Valuing Competencies of Secondary School Students.

Hypotheses

1. There is a significant difference between the means of scores of Emotional Intelligence and Valuing Competencies of Secondary School Students based on the background variables namely,
   (a) Gender (Male/Female)
   (b) Locality (Urban/Rural)
   (c) Type of Management (Aided/Private)
2. There is a significant relationship between Emotional Intelligence and Valuing Competencies of Secondary School Students.

Research Design

Methodology

Descriptive Survey Method was followed.

Sample

The sample is a small proportion of a population selected for the purpose of

representing the population. Stratified Random technique was employed to select the sample. The sample comprised of hundred and fifty Secondary School Students of Pathanamthitta District. The sample includes male and female students, students from aided and private schools, and students from urban and rural areas.

Distribution of Sample

Total Sample: 150

Variables	Classification	
Gender	Male (70)	Female (80)
Locality	Urban (60)	Rural (90)
Type of Management	Aided (75)	Private (75)

Tools to the Study

1. Emotional Intelligence Scale developed by Anukool Hyde and Sanjyot Pethe.
2. Valuing Competency Scale prepared and validated by the Investigator.

Statistical Analysis

The following statistical techniques were employed for the analysis of data collection.

1. Mean
2. Standard deviation
3. 't' – test
4. Karl Pearson product moment coefficient of correlation

Analysis and Interpretation

Significant difference between Emotional Intelligence and Valuing Competencies among different sub-groups

To find the significant difference between the mean scores of Emotional Intelligence and Valuing Competencies of Secondary School Students based on gender, locality and type of management, 't' test is used.

Table 1
Significant difference between Emotional Intelligence and Valuing Competencies of Secondary School Students

Variable	Category		Number	Mean	SD	't' value
Emotional Intelligence	Gender	Male	70	**130.88**	15.6	***2****
		Female	80	126.18	12.61	
	Locality	Urban	60	**132.13**	12.66	***2.11****
		Rural	90	127.33	15.17	
	Type of Management	Aided	75	**134.37**	15.27	***2.06****
		Private	75	129.17	15.72	
Valuing Competencies	Gender	Male	70	**139.82**	6.31	***2.97****
		Female	80	136.07	8.98	
	Locality	Urban	60	**141.25**	5.79	***2.80****
		Rural	90	138.25	7.26	
	Type of Management	Aided	75	**139.46**	6.89	***1.67@***
		Private	75	137.26	9.06	

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

Interpretation

From table 1, it is clear that the calculated 't' values for Emotional Intelligence 2,2.11,2.06 are greater than the table value 1.96 at 0.05 level. This shows that there is a significant difference in the mean scores of Emotional Intelligence of students based on Gender, Locality and Type

of Management. It is also interpreted that male, urban and aided school students scored higher emotional intelligence than female, rural and private school students; For Valuing Competencies the 't' value 2.97 and 2.80 are greater than table value 2.58 at 0.01 level and 't' value 1.67 is less than the table value 1.96 at 0.05 level shows that there is a significant difference in their mean scores of valuing competencies based on gender and locality and there is no significant difference in the mean scores of valuing competencies based on Type of Management. It is also interpreted that male and urban scored higher valuing competencies than female and rural students.

Relationship between Emotional Intelligence and Valuing Competencies of secondary school students

To find the significant relationship between the means of scores of Emotional Intelligence and Valuing Competencies of Secondary School Students, Karl pearson product moment coefficient of correlation is used.

Table 2

Correlation between emotional intelligence & valuing competencies of secondary school students

Variable	Number	'r' Value
Emotional Intelligence and Valuing Competencies	150	0.457*

*Significant at 0.01 level

Interpretation

From the table 2 it is clear that the calculated 'r' value 0.457 is greater than 0.128 at 0.01 level. This indicates that there is a significant relationship between Emotional Intelligence & Valuing Competencies of Secondary School Students.

Major Findings

1. There is a significant difference in the mean scores of Emotional Intelligence of secondary school students based on Gender, Locality and Type of Management.
2. There is a significant difference in the mean scores of Valuing Competencies of secondary school students based on Gender and locality.
3. Male is found to be higher than Female students in their emotional intelligence and valuing competencies.
4. Urban students is found to be higher than rural students in their emotional intelligence and valuing competencies
5. Students from aided school are found to be higher in their emotional intelligence than aided school students.
6. There is no significant difference in the mean scores of Valuing Competencies of secondary school students based on Type of Management.
7. There is a significant relationship between Emotional Intelligence and Valuing Competencies.

Educational Implications

The study reveals that there is significant relationship between emotional intelligence and valuing competencies of secondary school students. This finding shows the importance of emotional intelligence in the development of valuing competencies. Emotional intelligence and valuing competencies are not only the important determinants of personality, but also help to develop the students to a greater extent. Therefore the educational institutions should organize various programmes in all

curricular and co-curricular activities. Such programmes find more scope for female and rural students as their emotional intelligence and valuing competencies are found to be lower than male and urban students.

The study have their implications for students, teachers, teacher educators, curriculum planner, administrators and education policy makers in understanding the importance of emotional intelligence in the development of valuing competencies. The studies have special reference to teachers who are teaching value education. The quality of the nation depends upon the quality of the education imparted to its citizens. So, the students of to-day who are the powerful citizens of to-morrow have to be trained to develop Emotional Intelligence and Valuing Competencies.

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SOCIAL MATURITY AND ATTITUDE TOWARDS TEACHING OF ELEMENTARY TEACHER TRAINEES IN KOTTAYAM DISTRICT

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ABSTRACT

Effective and productive learning on the part of pupils can be achieved only by teachers with desirable attitudes. This paper discusses about the Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam district. The sample consists of Three Hundred Elementary Teacher Trainees from Teacher Training Institutes located in Rural and Urban background which are either Government or Government Aided. The tools used were Social Maturity Scale for Elementary Teacher Trainees and Scale of Attitude towards Teaching for Elementary Teacher Trainees, both are constructed and standardized by the investigators. The analysis of data using appropriate statistical techniques revealed that there exist a significant positive correlation between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District.

Key words: Social Maturity, Attitude towards Teaching, Elementary Teacher Trainees, etc.

Introduction

Teachers are expected to be positive role models for their students, both inside and outside the classroom. Rose (2005) has examined the role of educators as role models in formal and informal education, and stressed that role models can expose groups to specific attitudes, lifestyles and outlooks. Children often see teachers as important role models on par with their parents (Rose, 2005). According to Carr (2000), teachers, regardless of their subject area, have a moral role to play in educational process. It is the teacher's duty to be socially acceptable by keeping themselves more upright, refraining from gambling, abhorring darkness and other excesses and avoiding immoral relations. Teacher's actions could actually have some lasting effects on students.

Social maturity is a term commonly used in two ways; firstly with reference to the behaviours that conform to the standards and expectations of the adults and secondly with reference to the behaviours that is appropriate to the age of the individual under observation. Thus, the social maturation permits more detailed perception of the social environmentwhich helps adolescents to influence the social circumstances and

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develop stable patterns of social behaviour (Bretsch, 1952).

Attitude is defined as the individual mental processes which determine both the actual and potential responses of each person in the social world (Allport, 1996). Attitude is a response which can be positive or negative to any situation, event or object.

According to Hussain et al (2011), individuals' attitude towards their profession has an effect on their performance. It is also applicable for teaching profession, because the attitudes and perceptions of a profession affect the perceptions of professional competence and achievement. Teachers' attitudes should be shaped during their teacher education courses itself.

Since the teacher's personality influence the character formation of the children, the teacher must be socially matured, also he/she should possess a favourable attitude towards their profession. (Durmusoglu et al 2009, Terzi & Tezci, 2007). Teachers' attitude, his/her approaches to life, to students and to teaching has a great deal to do with how his/her students will be. The nature of a class starts with the teacher's attitude towards his profession and ends with the students' attitude. Teachers' Attitude towards Teaching plays a role in his/her ability to transfer teaching skill from simulated environment to natural setting.

In the elementary education stage, children are most influenced by the character and personality of the teacher. A teacher must require more social maturity than any other professionals because she/he has the duty to build up the brave future society. The teacher should be socially matured so that little children should get good models. And if the teachers' have a positive attitude towards their profession, they will develop creative thinking, motivate their students more easily, and adapt theirverbal and non-verbal messages to their students.

Therefore assessing the Social Maturity and Attitude towards Teaching of elementary teacher trainees as soon as they join the course will help the educators to plan various curricular and co-curricular activities for the teacher education programmes, which enable the prospective teachers to develop their Social Maturity and a favourable Attitude towards Teaching. Hence the investigators made an attempt to find the Social Maturity and Attitude towards Teaching of elementary teacher trainees in Kottayam District.

Hypotheses of the Study

1. There is significant difference in the Means of scores on Social Maturity of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management
2. There is significant difference in the Means of scores on Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management
3. There is significant relationship between Social Maturity and Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District
4. There is significant difference in the relationship between Social Maturity and Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management

Objectives of the Study

1. To find the Social Maturity of Elementary Teacher Trainees in Kottayam District

2. To find whether there is any significant difference in Social Maturity of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management
3. To find the Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District
4. To find whether there is any significant difference in Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management
5. To find the relationship between Social Maturity and Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District
6. To find whether there is any significant difference in the relationship between Social Maturity and Attitude Towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management

Methodology

The method adopted for the present study was normative survey method. The study was conducted on a sample of 300 Elementary Teacher Trainees in Kottayam District. The selection of the sample was done by stratified random sampling method, where due representation was given to Government and Aided institutions located in Rural as well as Urban areas. The tools used for collecting the data for the present study were a) Social Maturity Scale for Elementary Teacher Trainees and b) Scale of Attitude towards Teaching for Elementary Teacher Trainees, both are constructed and standardized by the investigators. For the Social Maturity Scale for Elementary Teacher Trainees, the reliability coefficient obtained was .65 (established by Split-half method) and intrinsic validity was .80. For the Scale of Attitude towards Teaching for Elementary Teacher Trainees, the reliability coefficient obtained was .85 (established by Split-half method) and intrinsic validity was .92. Both Descriptive and Inferential statistics were used for analysing the data.

Analysis and Interpretation of data

The present investigation is mainly intended to find the relationship between Social Maturity and Attitude towards Teaching ofelementary Teacher Trainees in Kottayam District. The analysis and interpretation of data has been done and presented below.

Analysis of objective I:Social Maturity of Elementary Teacher Trainees in Kottayam District

The data pertaining to this objective was collected by administering the tool 'Social Maturity Scale for Elementary Teacher Trainees'. The investigators had calculated the Mean and Standard Deviation of the data and classified Elementary Teacher Trainees under different levels Social Maturity on the basis of their scores. The minimum score for the scale was forty four and the maximum score was eighty eight. High Social Maturity means above the scoreM + Standard Deviation.Low Social Maturity comes below the score M- Standard Deviation and moderate Social Maturity has a range of scores between M- Standard Deviation and M+ Standard Deviation. Table I shows classification of Elementary Teacher Trainees of the total sample on the basis of scores on the Social Maturity Scale.

Table 1
Classification of Elementary Teacher Trainees of the total sample on the basis of scores on the Social Maturity Scale

Levels of Social Maturity	Range of Scores	Number of Elementary Teacher Trainees	Percentage
High	73-88	50	17
Moderate	57-73	214	71
Low	45-57	36	12

It is clear from the data in table I that majority of Elementary Teacher Trainees in Kottayam District have Moderate level of Social Maturity.

Analysis of objective II: Social Maturity of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management

The investigators divided the whole sample into two subsamples i.e. with respect to locale and type of management. To find the significant difference in the means of scores on Social Maturity for the

Subsamples selected, the investigators employed test of significance of difference between Means. The data and the result of test of significance is given in table 2

Table 2
Test of Significance of the difference between the Mean scores on Social Maturity of Elementary Teacher Trainees with respect to the subsamples

Subsamples		*N*	Mean	SD	df	t value	Level of Significance
Locale	Rural	121	65.33	7.70	299	0.65	p>.05
	Urban	179	63.90	6.90			
Type of Management	Govt.	84	64.10	7.60	299	1.61	p>.05
	Aided	216	64.70	7.30			

From Table 2 it is seen that the't' values obtained for the subsamples Locale and Type of Management are not significant. This shows that there is no significant difference in the means of scores on Social Maturity of Elementary Teacher Trainees with respect to Locale and Type of Management. Hence hypothesis I is rejected.

Analysis of objective III:Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District

The data pertaining to this objective was collected by administering the tool 'Scale of Attitude towards Teaching for Elementary Teacher Trainees'. The investigators had calculated Mean and Standard Deviation of the data and classified Elementary Teacher Trainees under different levels of Attitude towards Teaching on the basis of their scores. The minimum score for the scale was sixty six and the maximum score was hundred. High favourable Attitude towards Teaching means above the score M+Standard Deviation and Unfavourable Attitude towards Teaching comes below the score M-Standard Deviation. Moderately favourable Attitude towards Teaching has a range of scores between M- Standard Deviation and M+ Standard Deviation. Table 3 shows classification of Elementary Teacher Trainees of the total sample on the basis of scores on the Scale of Attitude towards Teaching.

Table 3
Classification of Elementary Teacher Trainees of the total sample on the basis of scores on the Scale of Attitude towards Teaching

Levels of Attitude towards Teaching	Range of Scores	Number of Elementary Teacher Trainees	Percentage
High Favourable	97-100	37	12.3
Moderately Favourable	81-97	223	74.3
Unfavourable	66-81	40	13.3

It is clear from the data in table 3 that majority of Elementary Teacher Trainees in Kottayam District have Moderately Favourable Attitude towards Teaching.

Analysis of objective IV: Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management: - The investigators divided the whole sample into two subsamples i.e. with respect to locale and type of management. To find the significant difference in the means of scores on Attitude towards Teaching for the subsamples selected, the investigators employed test of significance of difference between Means. The data and the result of test of significance is given in table 4.

Table 4
Test of Significance of the difference between the Mean scores on Attitude towards Teaching of Elementary Teacher Trainees with respect to the subsamples

Subsamples		*N*	Mean	SD	df	t value	Level of Significance
Locale	Rural	121	88.72	8.50	299	0.04	p>.05
	Urban	179	88.69	7.10			
Type of Management	Govt.	84	89.20	7.20	299	0.77	p>.05
	Aided	216	88.60	7.90			

From table 4, it is clear that the 't' values obtained for subsamples Locale and Type of Management are not significant. This shows that there is no significant difference in the means of scores on Attitude towards Teaching of Elementary Teacher Trainees with respect to Locale and Type of Management. Hence hypothesis II is rejected.

Analysis of objective V:Relationship between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District

Data related to this objective was analysed using Pearson's Product Moment Correlation. The data and the result is presented in table 5.

Table 5
The Variables, Number (*N*) and Product Moment Correlation 'r' between the scores on Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees

Variables	N	'r' value	't' value	df	Remark
Social Maturity and Attitude towards Teaching	300	.22	3.89	298	Significant at .01 level

From table 5 it is clear that the coefficient of correlation is significant (r=.22, t=3.89 p<.01) since the 't' value obtained is greater than the table value at .01 level of significance. This indicates that there exists a significant positive relationship between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District. It means that

as the Social Maturity rises, Attitude towards Teaching becomes favourable. Hence hypothesis III is accepted.

Analysis of objective VI:Relationship between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management

The investigators conducted an analysis to check whether there is any significant difference in the relationship between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District with respect to Locale and Type of Management. The data and result of tests of significance is presented in table 6.

Table 6

Results of tests of significance of difference in the 'r' between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees with respect to Locale and Type of Management

Subsamples		*N*	r	z	df	t value	Remarks
Locale	Rural Urban	121 179	.28 .18	.29 .18	298	0.92	Not significant at .05 level
Type of management	Govt. Aided	84 216	.38 .18	.40 .18	298	1.71	Not significant at .05 level

From table 6 it is clear that the 't' value obtained for the subsample locale is not significant. Therefore it can be concluded that the correlation between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees does not really differ in Rural and Urban located institutes.

Again, from table 6, it is clear that for the subsample Type of management, the obtained 't' value is not significant. Thus based on the evidence from table VI, we can conclude that the correlation between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees does not really differ in Government and Aided managed institutes. Hence hypothesis IV is rejected.

Findings of the Study

- Majority of the Elementary Teacher Trainees in Kottayam District have Moderate Social Maturity and only a Moderately Favourable Attitude towards Teaching.
- There is no significant difference in the Means of scores on Social Maturity of Elementary Teacher Trainees with respect to Locale and Type of Management
- There is no significant difference in the Means of scores on Attitude towards Teaching of Elementary Teacher Trainees with respect to Locale and Type of Management
- There is a significant positive correlation between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees in Kottayam District
- The correlation between Social Maturity and Attitude towards Teaching of Elementary Teacher Trainees does not really differ with respect to Locale and Type of Management

Conclusion

The major aim of education is to modify and direct the behaviour of students so that she/he becomes a useful member of the society. Socialization can be modified through training and education.

Again, a Healthy attitude of teachers towards their profession is a pre-requisite for a healthy school system. If teachers will lose faith in their profession and its contribution in making of the mankind and causing progress in the society; if the honour of the 'noblest of all' profession is not acknowledged and respected by the teachers, then their job satisfaction level will go down and the high position of teaching community will also be lowered.

The implication of current state of teachers holding less favourable attitude towards their profession is very dangerous as it not only kills the 'professional self' of a teacher but also dampens the spirit of the school life.

Orientation programmes should be organized at the Teacher Education periods itself so that the student teachers will become Socially Matured and develop a favourable attitude towards their profession. The present study might help the educational process in the field of Elementary Teacher Education so as to plan the curriculum accordingly.

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NEED OF A VOCATIONAL PEDAGOGY IN VOCATIONAL HIGHER SECONDARY EDUCATION OF KERALA

B. Shaji*

Abstract

Vocational higher secondary education in Kerala is still creeping in its infancy. This education system demands sweeping changes. Learners are not able to acquire even the skills within the present curriculum. First of all it needs an effective pedagogy before the content updation. The pedagogy of vocational education is wrongly conceived as academic pedagogy. These are entirely different. Developing a comprehensive theoretical framework for vocational pedagogy is now the at most need of the vocational higher secondary education. This is the focus of this paper.

For designing a vocational pedagogy, the outcomes must be realised. The paper indicates six outcomes such as Routine Expertise, Entrepreneurial sense, Resourcefulness, Functional literacies, Craftsmanship and Future skills. The approaches towards vocational subjects can't be same, as it differs like, working with Physical materials, People, Plants /Animals and Symbols. Experiential learning with social constructivism is the central in vocational learning. It also suggests the Critical thinking and problem-solving abilities should be incorporated in work-based learning. Vocational learning environment has dual nature as inside school and work-place. Vocational education teachers need dual professional identify of both workers skilled in a particular occupation and as teachers. Coaching is considering as new strategy in vocational education. This article proposes some learning methods for vocational education. It concludes that the effectiveness of all education systems depends critically on the quality of teaching and learning in the spaces in which the education takes place.

Keywords: vocational pedagogy, routine expertise, experiential learning, learning environment.

Introduction

Every education system comprises of two equally important things such as 'content' (what to teach) and 'pedagogy' (how to teach). Since the technology changes rapidly, continuous updation of the course content is needed in vocational education. The 'demand' of industry and the 'supply' of vocational education should be matched. For that proper linkage / participation of institute with industries is necessary. Now in our Country the discussions regarding Sector Skill Councils (SSCs), Qualification Frame work (NVEQF) etc... are going on. These initiatives may help to increase the quality, quantity, relevance and acceptance of vocational education in our country. The skill education methodology also has to be critically examined with the changing nature and

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culture of workplace. Successful delivery of learning requires specific pedagogy. But, there are only a few discussions regarding pedagogy of vocational education. This paper mainly deals with the pedagogy of vocational education.

'Vocational pedagogy' is the term regularly discussed in a number of European countries and in Australia. The concept of vocational pedagogy covers instructional strategy to teach vocational subjects in such a way that students learning experiences exist in work setting environment (*Syahron Lubis, 2010*). This kind of instructional strategy includes both school-based and work-based learning. Delivering system for vocational subjects differs from that of academic subjects. As *Bill Lucas, Ellen Spencer and Guy Claxton, 2012* explain that the primary outcome of vocational education is expertise. This distinguishes this education from academic form of education where the valued goal is to be able to write and talk something; to be able to explain critique, theorise and justify. Vocational education is the education for work and it makes provision for learner development of occupational skills in simulated and realistic work conditions. We cannot learn 'driving' in a class room without a vehicle. Thus, work place is indispensable for vocational subjects. We must evaluate critically whether work based learning is implemented properly in our Vocational Higher Secondary curriculum.

Vocational Education Pedagogy – Some Theoretical Considerations

Recent research evidences from Australia and Europe says that the VET (Vocational Education and Training) pedagogy is becoming learner-centered, work-centered and attribute focused (*Clive Chappell, 2004*). Learner constructs knowledge, skill and attitude through experiences from work place. Work has always been the central focus of the Vocational Education Training sector. According to *Colin Beard*, *John P Wilson* (*2007*), learning cycle has four distinct stages;

- Concrete experience
- Thinking about experience
- Generalising and conceptualizing about experience
- Applying the ideas and thoughts to new experience

They explain that if we do not get as far as stage three, then we have not really learnt from experience. Experiential learning which means learning through experiences is the central in vocational learning. Theories of experiential, activity based learning including constructivist theories and situated learning are prevalent in vocational learning (*Sally Faraday, Carole Overton, Sarah Cooper, 2011*). Situated learning involves the acquisition of knowledge and skills in the situations in which they will be used.

In *Istanto Wahyu Djatmiko's (2010)* views, constructivism and social – constructivism learning approach can be selected for implementing instructional strategies in this knowledge era. Constructivism is the theory that people learn by constructing knowledge through interpretive interactions with the social environment. It helps students to connect learning with life experiences, making constructivism highly relevant to vocational and career educators (*Bettina Lankard Brown 1998*). Acquiring skills through solving the real world problem is the heart of social constructivist pedagogy. On-the-job training, Apprenticeship training, Production/service cum Training Centers, Field visits, Vocational survey are some of

the learning activities where knowledge and skill are constructed through social interaction.

Secondary level career education based largely on human capital assumptions generally categorizes critical thinking and problem solving as transferable employability skills (*Emery J. Hyslop-Margison Joseph L. Armstrong, 2004).* Critical thinking is reasonable reflective thinking focused on deciding what to believe or do (*Wikipedia*). Mere practice of an activity may lead the learners to stick on the same process for solving a problem (Servicing of same machine having the same problem in school work shops). Learner must get enough opportunities to construct their own solution by interpretive interaction with others so that they can think critically. For that he should get more experiences in different situations (even in real life situations). For a Refrigeration and Air conditioning course, the learner may service different refrigerators having dissimilar problems in diverse contexts. Critical thinking and problem solving capacity are the essential learning abilities needed for a vocational learner. Creativity/innovation develops from this critical thinking. Employer needs an employee who can creatively contribute in his work than the passive one. Creation is the fruit of creative thinking and critical thinking. Creative thinking and critical thinking are complementary to each other (*Dar-Chin Rau, 2006).*

Related reviews and Significance of the Study

According to N. Sethu Madhavan (2005), Vocational Higher Secondary Education in Kerala lacks excellence; instructional strategies are not proper and its existing curriculum is not adequate. Kerala Curriculum Framework- 2007 also reiterates that the learner could not gain experience in vocation; curriculum does not help the child to face the challenges and thus it turned out to be an easy path for higher studies. Thus, vocational higher secondary education in the state is far aloof from achieving its objectives. The updation of vocational subjects' content is necessary. But that is not the core issue here. Learners are not able to acquire even the skills within the present curriculum. So, the problem is in the delivery of content (pedagogy). It emphasises the need of an effective pedagogy.

Objectives of the Study

To develop an effective vocational pedagogy in Vocational Higher Secondary Education of Kerala.

- To find out the outcomes needed for designing a vocational pedagogy in Vocational Higher Secondary Education of Kerala.
- To design a scientific approach to vocational subjects of Vocational Higher Secondary Education in Kerala.
- To explore more learning activities suitable to Vocational Higher Secondary Education of Kerala.

Methodology of Study

Analytical study which includes document analysis and interview schedule analysis is conducted. Document analysis was the main study and was based on the specific objectives (core areas). The same core areas were included in the interview schedule also. Stratified random sampling techniques were adopted for the sample selection. Interviews with teachers and instructors of different courses, departmental officials, industrialists and educational

experts were conducted. The area of the study was vocational higher secondary education in Kerala.

Semi structured interviews and document analysis were the tools used for this study. The collected data were analysed using Quantitative and Qualitative methodology. Findings are in the following three areas namely, Objectives of vocational education, Approaches to vocational subjects and Learning Methods.

A. Outcomes of Vocational Education

For designing any educational system, the objectives (outcomes) must be realised. Formerly skills or competencies (relating to the particular vocation) were the only outcome expected from a vocational training. But rapid changes that taking place in industry, the labour market, work and work organization, change 'vocational training' into 'vocational education' where a greater interest in basic skills (in literacy, numeracy, IT, communication, problem solving etc.....) are also included. Now the concept of 'worker' is changed to 'knowledge worker'. A training programme developed by *Jasminka Markovic and Michael Axmann (2006)* indicates eight outcomes (Key Competencies) in European Union Vocational Education Training System. They are: Communication in mother language, Communication in foreign language, Mathematical literacy, Digital Competency, Learning to learn, Interpersonal and civic competencies, Entrepreneurship and Cultural Expression. It says that this is a comprehensive and well balanced list of key competencies for personal fulfilment, social inclusion and employment in knowledge society of Europe.

According to *Bill Lucas, Ellen Spencer and Guy Claxton (2012*), there are mainly six outcomes which are critical for a vocational education. They are: Routine expertise (being skilful), Resourcefulness (to apply knowledge in different situation), Functional literacies, Craftsmanship (pride in a job well done), Business-like skills and wider skills (skills for future labour markets). While fixing the outcomes of a vocational programme for our state, we must consider our socio, economic and cultural factors. They are;

- Having educated unemployed youth.
- Supplier of human resource for national and international labour markets (most of them are acquiring skills after getting a job).
- The work culture (giving respect to manual works) is not prospective in our society.
- Industrially poor State. So an entrepreneurship attitude is necessary for our youths.

While considering these factors, the above six outcomes developed by Bill *Lucas, Ellen Spencer and Guy Claxton, 2012* are also suitable in our society to a great extend as discuss in the following way.

Routine expertise can be attained through deliberate practice. Deliberate practice involves a focus on improving particular tasks. Learning by practising also involves provision of immediate feedback, time for problem-solving and evaluation and opportunities for repeated performance to refine behaviour (*Ericsson, quoted by Bill Lucas, Ellen Spencer and Guy Claxton, 2012*). So even in school workshops or in work places, continuous practice is necessary for development of skill to a required level. Unfortunately in our school system we consider the *experiments* in academic subjects and *practical works* in vocational subjects are in the same manner.

In academic subjects, laboratory works are experiments which are just for proving theorems (like Ohm's law). But for vocational subjects, laboratory works are for acquiring skill/competency. So, continuous practice in workshops and in work places is required for acquiring each skill to a desired level. Mere completions of the number of practical works in vocational labs are not sufficient. It can be developed by watching, imitating, through careful and regular practicing, via feedback from teachers, experts and co-learners.

The vocational learner has to face something which is non routine (other than from his course of study) in real life situation. The learner should have **resourcefulness** (to apply knowledge in different situation) in his future career. Through extensive practice in different contexts, this can be achieved. The skilled labour who has resourcefulness will undertake the job (service/production) in a logical way within a stipulated time. It can be promoted by problem solving, through enquiry-based learning, using virtual environments and through simulation and role play.

Learning of communication (both in local language and in English), computer literacy and numerical skills (called together as **functional skills**) can be integrated with the vocational learning activities. The degrees of need of various components of functional skills for different vocations are different. The courses like Travel and Tourism necessitate more communication skill than Accountancy and Auditing. Through general learning activities like role play, creating virtual environments, group discussion etc... , functional skills can be achieved.

Craftsmanship is the pride or pleasure to practice a job. It is the important element in a vocational education. We must develop a positive work culture in our state where manual work is at low esteem. There should be a passion for the learner to the particular vocation. The environment around the learner creates a positive attitude towards the vocation he has chosen. According to *Bill Lucas, Ellen Spencer and Guy Claxton, 2012,* craftsmanship is learned primarily through prolonged exposure to certain cultures where excellence is constantly sought and where critical reflection is a way of being. Role modelling by vocational staff, experts and successful entrepreneurs are important. When teachers (vocational teacher/instructor) abstain from (they are just giving instructions, not taking part in the work.) the practical activities, the learners may feel that this work is having low status. The agriculture teachers have to be in the paddy field with the learners during ploughing, transplanting or weeding. So there must be lively participation by the vocational teacher/ instructor in all work based activities.

Entrepreneurial attitude has to be developed through the learning methods like case study, interview, field visit, role play, survey etc. Entrepreneurs convert idea into economic opportunities through innovations. Confidence, understanding marketing strategies, business communication skills, assessment of chances and risks, managing resources etc. are some of the needed skills of an entrepreneur. Learners should get a motivation for business during the course. Since we are industrially poor, we need job givers not job seekers.

Train the trainer for **future skills** is a great problem in vocational education. Future skills are needed for a skilled labour and even for a successful entrepreneur. Preparing the learner for self learning will encourage the life-long learning attitude and

which in turn will help to acquire the skills in future. Practising, feedback, teaching and helping others, real-world problem solving, enquiry, being coached, various kinds of simulation and role play are the methods for achieving future skills. Thus the six outcomes needed in our society are:

1. Routine expertise. 2. Resourcefulness. 3. Functional skills. 4. Craftsmanship. 5. Entrepreneurial attitude. 6. Future skills.

The learning activities can be selected according to the outcome or outcomes expected for a learning objective.

B. Approaches to Vocational Subjects

In our Vocational Higher Secondary education we are approaching all the 42 vocational subjects in the same manner. We classified the courses in to Engineering, Paramedical, Agriculture, Home science, Commerce and Travel & tourism streams. Can we need only a common vocational pedagogy to all these subjects? Even in engineering group, the nature of course like CA (Computer Applications) is entirely different than MRDA (Maintenance and Repairs of Domestic Appliances), or MRA (Maintenance and Repairs of Automobiles). Medium through which work is progressed is entirely different for them. The vocations such as servicing of appliances or automobiles are work-shed based, whereas computer application is office based. In work based pedagogy the nature of work place where learning takes place is important. As *City and Guilds* (*Bill Lucas, Ellen Spencer and Guy Claxton, 2012*) suggests, there are mainly three categories of vocational courses that focuses on working with:

1. Physical materials: E.g.: Civil Construction and Maintenance, MRDA, MRA, etc.
2. People: Domestic Nursing, Marketing and Salesmanship, Travel and Tourism, etc.
3. Symbols: (words, numbers and images). Accountancy& Auditing, Computer Science, Computer Applications, etc.

As the report says all vocations are working with the same three 'media', but to different extents. But after the analysis of our courses, there are certain subjects like Livestock Management (Dairy Husbandry), Livestock Management (Poultry Husbandry), Aquaculture; Agriculture etc. are not coming under even any one of the above three categories (Physical materials, People or symbols). So we can change the classifications into four categories like:

1. Physical materials. 2. People. 3. Plants / Animals. 4. Symbols.

Working with Plants/Animals is entirely different from working with Peoples/Physical materials/Symbols. Certain courses deal with *People* and *Physical materials* (like MLT). But courses like Travel and Tourism has the *People* as the main media. Courses like Automobile repairing, Domestic appliances repairing etc. are dealing mainly with *Physical materials* only. Some of the courses like Livestock and Aquaculture coming under the *Plants / Animals* group.

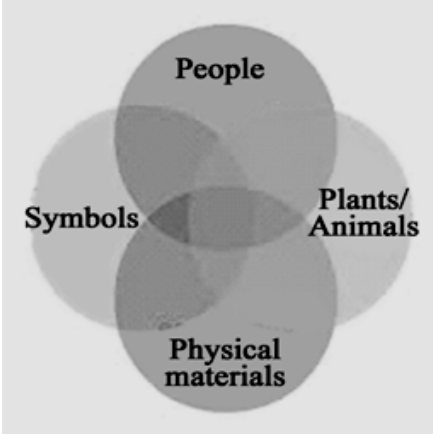

Figure 1: Four types of vocational subjects

The different category of Vocational subjects should have different approaches. In most of the vocations, more than one aspect of the above four is always involved.

Learning Environment

Unlike general subjects, the learning environment of vocational education is more complex. The Co-learners, Teacher/Trainer (experience, expertise and attitude) and the Physical location are the main factors for learning within a curriculum. Physical location is specifically important in vocational education, as most teaching takes place in the dual settings of both workplace and educational institution. The environment, particularly the outdoor natural environment, has much more to offer than just a 'location' for the delivery of experiential learning (*Colin Beard & John P Wilson, 2007*). The nature of work place is entirely different from the school work shop or from class room.

Physical location of Agriculture course (under *Plants /Animals* group) is an agriculture field, where as the physical location of Accountancy & Auditing is an Office. The cultures of these work places are also different in nature. While designing a vocational education curriculum for a course, the learning environment is very important. *Colin Beard & John P Wilson, 2007* suggest that the learning providers have to provide a range of environmental experiences and, where necessary, to manipulate, in a positive and beneficial way, many of the environmental ingredients that make up a powerful learning experience. An agriculture land is a must for an agriculture course within the school compound and also learner should get experiences from the real life out door environments. Outdoor environments are helpful to get non routine expertise.

Vocational Education Teachers

Vocational education teachers need dual professional identity of both workers skilled in a particular occupation and as teachers. For successful implementation of a vocational education, the teachers should have both expertise in the vocation and a pedagogical orientation. Intermittent industrial experience is vital for the teacher/ instructor to acquire the up-to-date skills in the vocation.

As a facilitator in constructivist approach, teacher should arrange multiple learning experiences to the learner in different situations. He can actively participate/demonstrate in the initial stage and then slowly he should recede his assistance for developing the independent problem solving capacity of the learner. *Sally Faraday, Carole Overton, Sarah Cooper. (2011)* reported in their publication that the learning is initiated from teacher directed, through guided learning, to cooperative learning and ultimately independent learning. They should have good relationship with learners.

Good teachers are always learning not only the subject skills but also the teaching skills. They learn from experience. Effective teachers are reflective and they constantly review their practice. They select the learning methods depends on the learners, outcome of the learning objective and the context of the learning.

Vocational Education Learners

Most of the learners enter into the course for studying a Higher Secondary Course. Their main intention is to study the academic subjects. Most of them are interested in vocational practical only if there is a challenge in them. Over loaded curriculum with academic subjects and even

crowded competencies in vocational subject itself makes them difficult to acquire skill in a particular area. Learning through real life problem solving will give them more motivation.

Vocational education is also suitable for most of the differently abled children. But, for each learner; there must have a scientific selection of vocational course depending on their disability and attitude.

C. Learning Methods

While thinking about the learning methods of vocational education, we must remember that this education is work-based. The 'learning by doing' approach can be used in most of the learning methods. But for getting resourcefulness (apply knowledge in different contexts), theoretical understanding is also necessary. Theory should not be isolated from practical activities as it happens in most of the vocational subjects. As *Lorna Fitzjohn,* quoted in the publication by *Bill Lucas, Ellen Spencer and Guy Claxton, 2012* explains that since theory and practice happen in geographically different places, or at different times; sometimes the learner won't be able to see that these two relate together. So learning methods should balance theoretical and practical components and they complement each other.

In activity based curriculum, most of the learning methods are progressing through group works. Learners work together for solving a problem. This improves the team spirit and creates a democratic atmosphere in class room/ workshop/work place. It helps the cooperative and collaborative learning. The use of inquiry, discovery and problem solving approaches can be incorporated in teaching and learning process. The number of learners in a group will depend on the specific learning objectives (sub competencies). The teacher as a facilitator must try to relate the maximum learning activities directly to the real world of work.

We need to develop the individual capacity of the learner for solving a problem alone. Most of the industries assign independent tasks to their employees (automation needs only few people on machines and mostly have individual tasks). Developing individual capacity is also needed for a good entrepreneur. There should be a space for self-learning in all learning activities. It helps him/her for life-long learning and thus can develop skills for future labour markets.

Some of the learning methods are given as:

1. Learning through deliberate practice.
2. Learning by watching and imitating.
3. Learning through simulation.
4. Learning through virtual environment.
5. Learning by real – life problem solving.
6. Learning through playing games.

As already stated, deliberate practice, which is the core of vocational education involves a focus on improving particular tasks. *Alan Brown, Liz Browne, Kathleen Collett, Chris Devereux, Jill Jameson. (2012)* illustrates that each learner should get coaching in a particular skill for a certain period of time. This is with the aim of helping them to learn to do job as fast as possible before moving onto the next station. On-the-job training and Apprenticeship training are some form of deliberate practice.

Learning by watching others is a common way of learning. Demonstration of real life situation (like field visit) or models gives the learner an opportunity to watch.

Watching the real work-place or virtual settings or using ICT (work place videos) are the learning process. After closely watching, imitating the activity is the way of trying to implement what was observed. Imitating the unwanted things from work places should be avoided.

Industrial simulation when used as an educational tool in the context proposed is part of an enquiry based learning (EBL) approach. During his research, *Simon Mclean, 2012* concluded that Simulation can be a valid tool for delivering teaching, learning, assessment and vocational skills training to surveying students. The real learning environment for industry related vocations is very rare in our state which is industrially poor. Simulation of natural setting is one of the solutions for it. As *Colin Beard*, *John P Wilson 2007* says – creation of artificial nature is growing and moving indoors. Production / Service cum Training Centres have an industrial simulation environment. It has an industrial atmosphere in indoor. But certainly simulation has its own limitations than work-place learning.

Vocational learning generally requires real hands-on experience. The use of e-learning is relevant to both the practical and the theoretical worlds in the sense that an increased use of e-learning can usually improve teaching and learning in both settings (*Final Report to the EU Commission, 2005).* Information Technology can be treated as a learning tool for development of functional literacies and entrepreneurial skills. Learning through virtual environment is suited for the courses dealing with people.

Learning though playing games is seemingly fun activities involving all participants. There are some learning objectives in some vocational subjects related to *Symbols* that can be learned through games.

Some learning methods will suit certain learners just as some teaching methods will be preferred by some teachers and avoid others. Contexts will influence choice too. According to *Istanto Wahyu Djatmiko*, *2010;* choosing appropriate teaching strategies is needed indeed, so that the learning process can adapt to the new context of schooling that related to the changing of technology and a workforce setting. Anyway, real life problem solving is most suited learning method in vocational education.

Coaching as an Efficient Strategy in Vocational Education

We must think the way how an athlete become expert in his/her area under a coach or a learner in any musical instrument become expert after getting regular coaching by a teacher. The coaching is different from teaching. In its publication,"*The role of coaching in vocational education and training"*, the *City and Guilds,* focus on "how to use coaching to improve workplace learning."

The above report says that the coaching is relative. It is not common for all learners. Those who need more attention to improve should get it. Coaching is dynamic in nature. It may change according to the work place demand. Both coach and coachee are actively participating in performance. It is performance oriented, not theory based. It is a live action-feedback-correction-improved action method that we lack in our educational system.

We have to think about the integration of coaching in our vocational education

curriculum. As it encourages the learner to be self- directed and self reflexive, it helps him to attain future skills as a needed outcome.

Conclusion

The effectiveness of all education systems depends critically on the quality of teaching and learning in the classrooms, workshops, laboratories, industries and other spaces in which the education takes place. While developing a vocational pedagogy we need to consider the nature of course and desired outcomes. The paper suggests six outcomes for our education system. They are routine expertise, resourcefulness, functional skills, craftsmanship, entrepreneurial attitude and future skills. Approaches towards the vocational subjects have to be changed based on the media they are working with. They are categorised into four as physical materials, people, plants/ animals and symbols. We lack work based pedagogy. Experimental learning through social constructivist approach with critical thinking and problem solving skills is the theoretical approach in vocational education. Routine expertise by real life problem solving is needed. Initially from teacher directed, through guided learning, to cooperative learning and ultimately independent learning is recommended. Vocational teachers and instructors need dual professional identity as skilled workers and teachers and they should lively participate in all work based activities .Some of the learning methods suitable for skill education are suggested. Integrating coaching in the curriculum is to be implemented to a possible level. It can be seen that an effective pedagogy is largely missing in our Vocational Higher Secondary Education system. Thus the vocational learners are the losers as a result of this omission (*Bill Lucas, Ellen Spencer and Guy Claxton, 2012*).

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EFFECTIVENESS OF COGNITIVE ACCELERATION APPROACH ON ACHIEVEMENT IN CHEMISTRY AMONG SECONDARY SCHOOL STUDENTS

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Abstract

The present study aimed to investigate the effectiveness of Cognitive Acceleration Approach on Achievement in Chemistry and its components - remember, understand, application, analysis, evaluation and creativity - among Secondary School Students when compared to Existing Method of instruction. The design selected for the study was true experimental, pre-test post-test non-equivalent group design. The sample selected included 78 eighth standard students. Descriptive statistics Mean and Standard deviation and the inferential statistics MANCOVA and ANCOVA were used for analyzing the data. The tools used in the study were test on Achievement in Chemistry and lesson transcripts based on Cognitive Acceleration Approach and Existing Method developed by the investigator. The study revealed that Cognitive Acceleration Approach is effective to develop Achievement in Chemistry among Secondary School Students when compared to Existing Method of instruction.

Key words: Cognitive Acceleration Approach, Achievement, Remember, Understand, Application, Analysis, Evaluation and Creativity

Introduction

Learning is a form of growth or change in a person which is manifested as new modes or pattern of behaviour. This change shows itself as skill, habit, attitude, and understanding or as knowledge or appreciation. One major aim of education is to maximize learning. The teacher tries to accelerate the process of acquisition of knowledge and the learning process in one way or the other. A teacher cannot make a child learn. He can provide appropriate situations for the child who would learn by reacting in such situations and the group climate of the classroom and school, help in making learning more effective. Learning is meaningful when students are able to construct their own knowledge, transfer the same and use it in new learning situations. Such Learning empowers individuals and organizations to make wise choices, solve problems and break new ground.

We are living in what is called the scientific age. In a world of today where knowledge being multiplied exponentially, Science Education will not be able to justify

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itself by remaining merely contended with the objective of imparting a certain quantum of scientific knowledge. It should train young minds and makes them to develop different skills that are needed for a successful life. Science Learning is meaningful when students use these skills in their learning process to construct their own knowledge, transfer this knowledge and use it in new learning situations. Such Learning empowers individuals and organizations to make wise choices, solve problems and break new ground. Science should emerge as something alive and therefore exciting. Such a model will meet the wider aims of Science education, and at the same time is more likely to encourage students who want to study Science.

The Nature of Science and Science Education

Science is a process of diligence, refined over the years, by which we observe things as they are and events as they happen. It is a process of ordering and classifying and so of establishing relationships, formulations, explanations and hypotheses through experiments and so of understanding our world. Science has introduced ways of thinking such as critical thinking, reflective thinking and reasoning. It trains our mind and makes us to develop socially desirable values. The most distinguishing characteristic of science is the way it finds knowledge, i.e., the method it uses for exploring the universe. It is an activity that takes place in the minds of men as a result of certain intellectual processes. These intellectual processes are the means by which one can examine the unknown, explore and investigate through experimentation, and analysis of the environment.

By interacting with the society, child develops a variety of ideas about science and its nature. The personal experience of the learner through suitable learning activities provides him/her proper awareness on this. A mere learning of scientific ideas and theories will not enable the learner to understand the nature of science. Acquisition of scientific ideas will not, by themselves, develop a scientific perspective. Experiences that facilitate this should be provided to the learner right from the beginning of his/her schooling.

According to Kerala Curriculum Framework (2007), while handing over the wealth of science to the next generation, it is important that the following ideas are considered: i) science cannot be viewed as a finished product. Knowledge is constructed through experience. ii) The process-oriented method of learning helps the learner construct new forms of knowledge. Iii) Concepts and ideas in science that the learner constructs should have linkage with real life situations.

Significance of Science Education

Science and Technology have been central to India's development efforts since achieving independence. Jawaharlal Nehru, the first Prime Minister, was a firm believer in the crucial importance of science and technology for economic growth and social transformation, and helped lay a firm foundation of science and science education in the country.While delivering the convocation address of Allahabad University in 1946, Nehru said, it is Science alone that can solve the problems of hunger and poverty, of insanitation and malnutrition, of illiteracy and obscurantism of superstition and deadening customs, of rigid traditions and blind beliefs, of vast resources going to waste of a rich country inhabited. Dr.C.V.Raman, one of India's most eminent scientists said, there is only one solution for

India's economic problems and that is science, more science and still more science.

The great value of science is that it has introduced us to new ways of thinking and reasoning. The chief part played by science in helping to develop consciousness of man is to be found in the new thoughts that it has made us think. "Science Education is not information centred but it is based on Experiment" (Patel, Yagnik and Vakil, 2006).

Science Education Today

In India, with Independence emerged a model of economic development that set great store by science and technology. In order to accomplish the dream of a modern, prosperous India propelled by science and technology, school science education received a special attention. If we look at the evolution of school science in India, we see a clear trend of including more and more content, overwhelmingly in the form of factual information, in the syllabus. The factual information that dominates the syllabi was not supported by any kind of activity, which can make it reasonable. The consequence of this is that students find science not only difficult but also boring.

The conventional school science emphasizes the products of science - laws, theories, etc. In some sense the process-product debate continues to this day, with the mainstream in favour of teaching products. It has been reported that the Indian educational system is failing to develop children's latent abilities and intelligence and so failing to prepare them for developing their Intellectual Skills. Following are certain major criticisms leveled against the prevailing science education given in Kerala Curriculum Framework (2007).

- There is a belief that the aim of science education is to transmit knowledge that has already been gathered
- The learning process is neither process-oriented nor learner-centred.
- There is a tendency to promote rote learning of concepts in science to excel in examination and the innate curiosity and scientific temperament of the learner are neglected
- Learning of science fails to become interesting and challenging to the learner.
- Science education has yet to become life related

Cognitive Acceleration through Science Education (CASE)

Cognitive Acceleration through Science Education (CASE) is an innovative teaching approach elaborated out of research into cognitive development based largely on the work of Piaget and also incorporating fundamental tenets of Vygotsky's theories of learning. Its basic aim is to accelerate the upgrading of children's thought from the concrete to the formal operational level. CASE focuses on enhancing pupils' capabilities in understanding science concepts. Cognitive acceleration is the process of accelerating students' 'natural' development process through different stages of thinking ability, towards the type of abstract, logical and multivariate thinking which Piaget describes as 'formal operations'.(Adey S. Philip 1990)

Cognitive Acceleration Approach is a student centered instructional strategy in which students collaboratively solve problems and reflects on their experience. It promotes students active engagement with learning. Solving cognitive conflicts demands students' participation. Learning becomes the act of discovery as students examine the problem, research its back ground, analyse possible solutions, develop a proposal, and produce a final result. Not

only is this active learning more interested and engaging for students but also develops a greater understanding of the material since students find the information for themselves. Actively use the information and their thinking skills to complete the project.

By cognitive acceleration we mean the process of accelerating students' natural development process through different stages of thinking ability towards the type of abstract, logical and multivariate thinking. (Adey S. Philip 1990). The mind's ability to process information could be changed by suitable instructional approaches in response to the demand placed upon it by challenging problems**.** This occurs when a student encounters a problem which he cannot easily solve for himself, but which, with carefully structured help from an adult or more able peer, he/she can solve or at least gain an understanding the nature of, so that the solution is more likely to become available later. The principle of cognitive conflict is also encapsulated within the idea of a 'zone of proximal development' (ZPD) developed by the Russian psychologist Lev Vygotsky (1978). The ZPD is the difference between what a child can do unaided, and what he can do with the help of an adult. Cognitively stimulating experiences are those which take place within the ZPD or 'construction zone'.

Lessons based on cognitive acceleration approach, which develop abstract thinking directly, have the following structure: .(Adey S. Philip 1990)

1. An introduction which sets the scene (concrete preparation)
2. A puzzle or challenge which needs to be solved (cognitive conflict)
3. Group-work where pupils share ideas for solutions (social construction)
4. Explaining the thinking which gave the answer (meta-cognition)
5. Bridging

1. Concrete preparation

Concrete preparation is an essential preliminary stage to ensure the pupils understand the initial problem. Unless the terms have a real meaning for pupils, a problem may not be seen as a problem. There must be a phase of preparation in which the language of the problem is introduced, along with any apparatus to be used and a context in which the problem is set. The aim is to ensure that the difficulties encountered are just intellectual, and as far as possible are not compounded by problems of language or context. Also it links the new learning to previous experiences.

2. Cognitive conflict

A core feature of CASE is maintaining what Adey and Shayer refer to as 'cognitive conflict'. This means providing students with challenging activities which are just beyond their current capabilities but which, with appropriate support from the teacher and more able peers, stretch the mind. Learning tasks that are well within the child's capability do not provide the challenge that stimulates cognitive growth. This must be set just above the current level of secure knowledge - hard enough to be a challenge, but not so hard as would make the learners switch off.

3. Social construction

This is the process that Shayer and Adey emphasise in order to help pupils reach a more complete understanding of the task. The emphasis here is on the student's own construction of higher-level modes of thinking. The teacher can provide the appropriate experiences and lead, through careful questioning, but cannot put higher-level thinking capability directly into the student's mind. But if pupils work in groups and discuss their ideas there are several benefits: group members act as mediators

for each other, suggesting solutions, trying out ideas; individuals feel less vulnerable and more able to participate; random ideas from group-members act as the clues offered by the mediator.

4. Meta-cognition

Shayer and Adey also emphasise the role of what they call 'metacognition' in putting pupils in charge of their own learning. Here they refer to the importance of enabling pupils to articulate their own thinking and learning processes. In CASE during both group-work and the Plenary, the teacher asks questions designed to reveal the thinking process. This process - meta-cognition - has been shown to be highly effective in securing the knowledge. The learner has to put into words the line of thinking - which makes the process more available both to others listening and the learner. The students are encouraged to take time to reflect on how they solved a problem, what they found difficult about it, what sort of reasoning they used, how they sought help and what sort of help they needed. Meta-cognitive review can help children link fragments of experience during a lesson to the wholeness of their experience.

5. Bridging

Knowledge learned in isolation from the learner's knowledge base is usually lost. The learner needs to link the new learning to existing experiences. Cognitive Acceleration lessons conclude with a discussion about where these ideas could be used in other contexts within science, mathematics or other parts of the curriculum and to experiences in real life.

Need and Significance of the Study

Science has become so close to life of everybody that both science as well as the quest for improved methods of teaching science constitute a significant feature of the present day science dominated world. One important approach to teaching children is to develop a classroom environment that encourages children to make discoveries. For this children have to learn and use a number of investigatory procedures commonly referred to as the process of science. Science learning should give knowledge and information about the world we live in also, it should make provision for enabling the students to acquire control over scientific information, and develop scientific attitude and values. To realize these objectives of Science education students should be equip with the skills needed for fulfilling career of lifelong learning.

But in many classrooms, learning is a passive activity. Even in science classes, teachers rarely allow students to discover principles for themselves, but instead present the mathematical techniques and scientific law and then make assignments where students simply practice what they already have been taught. Research indicates that thinking skills are not typically addressed in the classroom. A number of studies indicate that in the typical classroom, 85% of teacher questions are at the recall or simple comprehension level. Questions that elicit synthesis and evaluation skills of thinking are rarely asked.

But we need a science teaching, where the processes of science -observation, recording, performing controlled experiments- are emphasized. It is urgent to move to a new model of school science education, in which science is not alien, but organically linked to children's experiences. The processes of science have to be given due importance, and children have to be given opportunities to do things "hands-on." Above all, science should emerge as something alive, fallible, and therefore

exciting. Such a model will meet the wider aims of science education, and at the same time is more likely to encourage potential scientists to want to study science.

Since 1989, the CASE project has developed into an extensive pedagogic programme in U.K., which has become part of the framework for teaching and learning for many children. The project was designed to produce long term gains in academic achievement by attempting to raise children's intellectual performance so that they would be more likely to succeed. Adey and Shayer studied the effect of CASE on achievement in Science. Case studies other than those of Adey and Shayer given additional checks to this. But the effectiveness of CASE on different branches of Science has not yet been studied. So the investigator decided to study the effectiveness of Cognitive Acceleration approach in Chemistry.

Objectives of the Study

1. To study the distribution of scores of Achievement in Chemistry among the pupils of Standard Eight of experimental and control groups.
2. To study the effect of cognitive acceleration approach on Achievement in Chemistry when compared with existing method among secondary school students
3. To study the effect of cognitive acceleration approach on Achievement in Chemistry when compared with existing method among secondary school students in terms of components.

Hypotheses of the Study

1. There is significant effect of cognitive acceleration approach when compared with existing method on Achievement in Chemistry among secondary school students of Kerala state.
2. There is significant effect of cognitive acceleration approach when compared with existing method on Achievement in Chemistry in terms of components among secondary school students of Kerala state.

Variables of the Study

In this study there were two independent variables. They are the treatment variables. Treatment variables are the instructional variables. They are instruction through Cognitive Acceleration approach and instruction by using existing method. Intelligence was taken as the extraneous variable. The dependent Variable of the study was Achievement in Chemistry. The components of Achievement in Chemistry are (Anderson and Krathwohl 2001):Remember, Understand, Apply, Analyze, Evaluate and Create.

Methodology of the Study

The investigator selected true experimental pre-test, post-test non equivalent group design for the present study. In this design there are two groups. One of the groups serves as the experimental group and the other as the control group. The study aimed at finding out the effectiveness of Cognitive Acceleration Approach on Achievement in Chemistry among the students of Standard Eight of Kottayam District.

Tools used in the Study

The investigator used the following tools during the different phases of the study. (i)Test on Achievement in Chemistry (ii) Lesson transcripts based on Cognitive Acceleration Approach and Existing Method.

Sample for the Study

The population for the present study covers all the pupils of Secondary Schools of Kottayam District Kerala. For convenience the investigator limited the study to standard VII only. The sample was selected by using purposive sampling. The investigator selected Holy Cross Higher Secondary School Cherpunkal in Kottayam District for selection of sample for the present study. From the school the investigator selected two Groups randomly as Experimental and Control consisting of 39 students each.

Statistical Techniques Used

Descriptive statistics Mean and Standard deviation and the inferential statistics MANCOVA and ANCOVA were used for analyzing the data.

Analysis and Findings

Analysis of Objective one: ***Distribution of Achievement in Chemistry among the Pupils of Experimental and Control Group.***

The first objective was to study the distribution of scores of Achievement in Chemistry among the pupils of Standard Eight of Experimental and Control Group. From the table values it is interpreted that most of the pupils possess average scores on Achievement in Chemistry.

Table 1

Distribution of Achievement in Chemistry among the Pupils of Experimental and Control Group.

Variable	Group	N	Mean	SD
Achievement in Chemistry	Experimental Group	39	25.282	4.656
	Control Group	39	21.051	4.806

From the table it is observed that the values of the mean of the Post test scores of the Experimental and Control Group are 25.282and 21.051respectively. The Standard Deviation of the Post test scores of Experimental and Control Group are 4.656and 4.806 for N= 39

Analysis of Objective two: ***Effect of Cognitive Acceleration Approach on Achievement in Chemistry***

The second objective of the study was to find out the effect of Cognitive Acceleration Approach on Achievement in Chemistry when compared with existing method among secondary school students of Kerala state. In order to analyze this objective the investigator formulated the following null hypothesis.

H02: There is no significant effect of Cognitive Acceleration Approach when compared with existing method on Achievement in Chemistry among secondary school students of Kerala state. The investigator administered Pretest and Post test on Achievement in Chemistry for the Experimental and Control Group and thus obtained the data needed for the testing of this null hypothesis. The hypothesis was tested by using the statistical technique ANCOVA by taking Intelligence of the students as covariate. The levels of significance were fixed at 0.01 and 0.05 levels for degrees of freedom 76. The data and analysis are presented in the following table.

Table 2

Type III Sum of Squares, degrees of freedom 1, degrees of freedom 2, within subject mean square, between subject mean square f value and P value for Achievement in Chemistry

Sub variables	Type III Sum of Squares	Df1	Mean Square	Error variance	Df2	Within subject mean square	F value	P value
Achievement in chemistry	327.983	1	327.98	1012.74	75	13.503	24.289	.000

The type III sum of squares is 327.983 and the level of significance P value (ie confidence level of calculated F value or probability of type II error) is .000. Therefore the F value, 24.289 is significant at .01 level of confidence, and hence the null hypothesis H_{02} that 'There is no significant effect of Cognitive Acceleration Approach when compared with existing method on Achievement in chemistry among secondary school students of Kerala state' is not accepted. Hence the research hypothesis that 'there is significant effect of Cognitive Acceleration Approach when compared with existing method on Achievement in chemistry among secondary school students of Kerala state' is accepted. So it can be interpreted that there is significant effect of Cognitive Acceleration Approach when compared with existing method on Achievement in Chemistry.

Analysis of Objective three: Effect of Cognitive Acceleration Approach on the components of Achievement in Chemistry

The third objective of the study was to find out the effect of Cognitive Acceleration Approach on the components of Achievement in Chemistry when compared with existing method among secondary school students of Kerala state. The components of Achievement in chemistry selected for the study are Remember, Understand, Application, Analysis, Evaluation and Creativity. In order to analyze this objective, the investigator formulated the following null hypothesis.

H02: There is no significant effect of Cognitive Acceleration Approach when compared with existing method on the components of Achievement in Chemistry among secondary school students of Kerala state.

The investigator administered pretest and posttest on Achievement in Chemistry for the Experimental and Control Group and thus obtained the data needed for the testing of this null hypothesis. The hypothesis was tested by using the statistical technique MANCOVA. The levels of significance were fixed at 0.01 and 0.05 levels for degrees of freedom 76. The data and analysis are presented in the table.

Table 3

Type III Sum of Squares, degrees of freedom 1, degrees of freedom 2, within subject mean square, between subject mean square f value and P value for Components of Achievement in Chemistry

Sub variables	Type III Sum of Squares	Df1	Mean Square	Error variance	Df2	Within subject mean square	F value	P value
Remember	.713	1	0.713	27.021	75	.360	1.980	.164
Understand	42.179	1	42.179	171.816	75	2.291	18.412	.000
Application	35.299	1	35.299	139.581	75	1.861	18.967	.000
Analysis	1.999	1	1.999	43.557	75	.581	3.441	.068
Evaluation	6.503	1	6.503	34.406	75	.459	14.176	.000
Creativity	1.474	1	1.474	45.232	75	.603	2.445	.122

The type III sums of squares for different components of achievement are 0.713, 42.179, 35.299, 1.999, 6.503 and 1.474 for Remember, Understand, Application, Analysis, Evaluation and Creativity respectively. The level of significance P value for F values of different components of achievement are.164,.000,.000,.068,.000and .122 for Remember, Understand, Application, Analysis, Evaluation and Creativity respectively. Therefore the F values, 18.412, 18.967, 14.176 for the components Understand, Application and Evaluation are significant at .01 level of confidence, and hence the null hypothesis H_{02} that 'There is no significant effect of Cognitive Acceleration Approach when compared with existing method on the components of Achievement in chemistry among secondary school students of Kerala state' is not accepted for the components Understand, Application and Evaluation. And for the components Remember, Analysis and Creativity the F values are .164,.068 and .122 respectively and hence the null hypothesis H_{02} that 'There is no significant effect of Cognitive Acceleration Approach when compared with existing method on the components of Achievement in chemistry among secondary school students of Kerala state' is accepted. Hence the research hypothesis that 'there is significant effect of cognitive acceleration approach when compared with existing method on the components of Achievement in chemistry among secondary school students of Kerala state' is accepted for the components Understand Application and Evaluation.

Major Findings of the Study

1. There is significant effect of Cognitive Acceleration Approach when compared with existing method on Achievement in chemistry.
2. There is significant effect of cognitive acceleration approach when compared with existing method on the components of achievement viz. Understand Application and Evaluation. And there is no significant effect of Cognitive Acceleration Approach when compared with existing method on the other three components of achievement namely Remember, Analysis and Creativity.

Summary and Conclusions

Cognitive acceleration is a programme, a social constructivist approach, developed within a subject context, to promote different thinking skills especially higher order thinking among children through the presentation of cognitive conflicting situations. The Cognitive Acceleration programme enhances pupil's information processing ability by setting cognitive challenges and encouraging the pupils to reflect and become more conscious of their own thinking. Resolving cognitive conflicts through discussion in small groups is the key factor in cognitive acceleration. When students resolve these cognitive conflicts through discussion in small groups, it is successful in promoting higher order thinking skills and supports meaningful learning in a better way.

The major findings of the study reveal that the Cognitive Acceleration Approach is more effective than traditional method of teaching. This method helps to improve Achievement in Chemistry among Secondary School students. It is hoped that the findings of the present study will

encourage, stimulate and even provoke further researches in the field of Chemistry.

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