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## Preparation and Testing of Computer Assisted Model for Learning Mathematics at Secondary Level

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Computer-assisted instruction (CAI) programs are considered as a way to improve learning outcomes of students. However, little is known on the schools who implement such programs as well as on the effectiveness of similar ICT – programs. We provide a literature review which pays special attention to the existing causal evidence of computer - assisted programs on learning outcomes. The results suggest that schools with lower educational attainments use more frequently computer - assisted instruction programs. This suggests that they use CAI - programs to catch - up on learning outcomes. Working with a CAI – program seems therefore effective.

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## Introduction

“Education either function as an instrument which is used to facilities integration of the younger generation into the logic of the present system and bring about conformity or it becomes the practice of freedom, the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world”. Computer assisted instructions (CAI) are given procedures or steps provided by means of a computer to perform a certain action or solve a problem. This is a form of education that was introduced in the 1960's and can be done by either by straight presentation of data or in form of question and answer. The use of computers in education started in the 1960s. with the advent of convenient microcomputers in the 1970s, computer use in schools has become widespread from primary education through the university level and even in some preschool programs. Instructional computers are basically used in one of two ways: either they provide a straightforward presentation of data or they fill a tutorial role in which the student is tested on comprehension. If the computer has a tutorial program, the student is asked a question by the computer; the student types in an answer and then gets an immediate response to the answer. If the answer is correct, the student is routed to more challenging problems; if the answer is incorrect, various computer messages will incident the flaw in procedure, and the program will bypass more complicated questions until the student shows mastery in that area. There are many advantages to using computers in educational instruction. They provide one-to-one interaction with a student, as well as an instantaneous response to the answer elicited, and allow students to proceed at their own pace. Computers are particularly useful in subjects that require drill, freeing teacher time from some classroom tasks so that a teacher can devote more time to individual students. A computer program can be used diagnostically, and, once a student's problem has been identified, it can then focus on the problem area. Finally, because of the privacy and individual attention afforded by a computer, some students are relived of the embarrassment of giving an incorrect answer publicly or of going more slowly through lessons than other classmates.

## Need and Significance of the Study

The educational capacity of the student is judged by his achievement in the school. The academic performance in school subjects will lead

them to choose the future course of life. In the high school level itself the basic things will be known by the students. This is an important stage not only for studying habits influencing the academic achievement, but also to bear on the whole personality of the school students. The investigator would like to know, 'Is there any relationship between parent's behaviour on the child's adjustment and academic achievement of the School students?'. The knowledge of the relationship between these variables under study would help the parents and students to make the needed changes. Understanding the relationship between parent's behaviour on the child's adjustment and his academic achievement will be of great importance in determining the interrelation between the variables under study. The results of the present study will be useful to understand the fact, whether parent – child relationship has greater impact on the child's adjustment and academic outcome of the students. The findings can be utilized in the field of education to develop remedial measures, favourable relationship between the parent and the child which in turn will help the high school students. As a result healthier school community, society and the nation will be formed.

Information is presented in a structured form. It proves useful in the study of a subject where there is hierarchy of facts and rules. CAI forces active participation on the part of the student, which contrasts with the more passive role in reading a book or attending a lecture. CAI utilizes a responding system that provides the student with a clear of his progress. Thus students can identify the subject areas in which they improve and in which they need improvement. By enabling student to manipulate concepts directly and explore the results of such manipulates, it reduces the time taken to comprehend difficult concepts.

CAI offers a wide range of experience that are otherwise not available to the student. It works as multimedia providing audio as well as visual inputs. It enables the student to understand concepts clearly with the use of stimulating techniques such as animation, blinking, graphical displays etc.

### Objectives of the Study

The objectives of the present study are,

- To prepare the Computer Assisted Model (CAM) for learning mathematics in standard IX
- To test whether there is any significant difference between control group and experimental group with regard to pre-test.

- To test whether there is any significant difference between control group and experimental group with regard to post-test.
- To test whether there is any significant difference between Pre-test and Post-test achievement scores of control group.
- To test whether there is any significant difference between Pre-test and Post-test achievement scores of experimental group.

### Hypotheses of the Study

Hypotheses of the present study are,

- There will be significant difference between experimental (computer assisted model) group and control (active model) group method with regard to achievement scores when the treatment groups are exposed to experimental teaching (Total sample)
- There will be significant difference between the pre- test achievement scores of male and female students in the control group.
- There will be significant difference between mean of post-test achievement scores male students of computer assisted model group and activity method group
- There will be significant difference between Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group
- There will be significant difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

### Method Used for the Present Study

The investigator has used experimental method to preparation and testing of computer assisted model for learning mathematics at secondary level.

### Population & Sample

For the investigation of standard students were selected from Sree Krishna Hindu Vidyalaya Matric. Hr. Sec. School, Kanchinagar,

Kanyakumari District as the sample. The sample of 60 students selected for the study.

## Analysis of Data

H1: There will be significant difference between experimental (computer assisted model) group and control (activity model) group method with regard to achievement screen when the treatment groups were exposed to experimental teaching.

Table 1

Difference between means of pre-test and post-test achievement scores of computer assisted model group and activity model group.

S.No	Source of variance	df	SS <sub>x</sub>	SS <sub>y</sub>	MS <sub>x</sub>	MS <sub>y</sub>
1	Among groups	1	384	510.41	384	510.41
2	Within groups	58	1910.734	852.574	32.943	14.699
	Total	59	2294.734	1362.984	416.943	525.109

The obtained value of  $F_1 F_x = 11.656$  and  $F_y = 34.724$  is greater than  $F$  at 0.05 level and 0.01 level, it can be concluded that the groups (I & II) differ significantly w.r.to pre-test and post- test achievement scores.

H2: There will be significant difference between the pre – test achievement scores of male and female students in the experimental group

Table 2

Difference between means of post-test achievement scores male and female students of computer assisted model group

S.No	Gender	Number of students	Mean	Variance	t' value	Level of significance
1	Male	8	46.625	3.125	1.944	Not Significant
2	Female	28	48.136	4.694		

It is evident from table 2 that there is no significant difference between male and female students with regard to post – test achievement scores of computer Assisted method group ( $t = 1.944$ ;  $p > 0.05$ )

H3: There will be significant difference the male students of control group and experimental group in their post – test achievement scores

Table 3

Difference between mean of post-test achievement scores male students of computer assisted model group and activity method group

S. No	Group	Number of students	Mean	variance	t' value	Level of significance
1	Control group	16	38.875	19.716	6.083	Significant
2	Experimental group	8	46.625	3.125		

It is evident from table 3 that there is significant difference between male students with regard to post –test achievement scores of computer assisted model group and activity method group ( $t = 6.083$ ;  $p < 0.01$ )



H4: There will be significant between the community of students with difference regard to post – test achievement scores when the group is experimental teaching.

Table - 4

Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group

S. No	Community	Number of students	Mean	Variance	t' value	Level of significance
1	BC	28	47.928	3.698	0.969	Not significant
2	MBC	2	45	18		

It is evident from table 4 that theme is no significant difference between BC and MBC students with regard to post – test achievement scores of computer Assisted model group ( $t = 0.969$ ;  $p > 0.05$ ).

H5: There will be significant difference among the post-test achievement scores of students in the Experimental group based on the qualification of father.

Table 5

Difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

S. No	Father's educational status	Number of students	Mean	Variance	F' value	Level of significance
1	SSLC	15	47.666	4.380	0.063	Not Significant
2	HSC	4	47.5	3.666		
3	Graduate	11	47.909	6.090		

The table 5 shows that calculated f value (0.063) is less than F critical value (3.354) at 5% level of significance. Hence it can be concluded that there is no significance among students based on father's qualification (SSLC, higher secondary, graduate) with regard to post – test achievement scores.

### Findings

- ✚ There is no significant difference between the pre- test achievement scores of male and female students in the control group.
- ✚ There is significant difference between mean of post-test achievement scores male students of computer assisted model group and activity method group
- ✚ There is no significant difference between Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group
- ✚ There is no significant difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

## Educational Implications

The findings of the study will be useful to develop innovative models and methods of teaching different subjects. The study can be used to collect details about the methods of teaching commerce using concept maps. It can be used to develop various skill and capabilities in students at different levels of education.

The findings of the study can be utilized for planning curriculum including text book resource book, hand book, etc. Moreover the findings can be used to develop learning models in different subjects to make the teaching learning process more effective and meaningful.

## Conclusion

Comparison of Achievement Scores (pre-test and post-test) of Experimental (Computer Assisted Model) and control group (activity model) using ANOVA revealed that there is significant between post-test achievement scores Computer Assisted Model group and activity model group. And the difference is in favour of computer assisted model. Hence it can be concluded that it is more effective than activity model group for teaching triangles in mathematics at standard IX.

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## Integrating Skill Development in Higher Education

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India has the largest number of young people and the highest global unemployment rate - these are pointers to the nature and efficiency of our education system. The entire skill set required to work in a company that competes at the global level has undergone a change, and education, particularly higher education, cannot afford to overlook the new realities of the 2nd decade of the 21st century. Surveys and studies are conducted at regular intervals and it is reiterated in the surveys and studies that the 80 percent workforce in rural and urban India does not possess any identifiable employability skills. The World Economic Forum's Global Talent Risk report (2011) cautions that developing countries like India and Brazil will face huge skill gaps due to low employability. India can reap the benefits of this situation only by effectively Skilling and up- Skilling, its vast manpower by mainstreaming vocational education, modules of finishing school and partnership of industry-academia in the curriculum of higher education.

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**Key words:** Unemployment, Skill development, Higher education, Employability, and Vocational education.

Today, the world and India need a skilled workforce. If we have to promote the development of our country, then our mission has to be 'skill development' and 'Skilled India'. Millions and millions of Indian youth should acquire the skills which could contribute towards making India a modern country. I also want to create a pool of young people who are able to create jobs and the ones who are not capable of creating jobs and do not have the opportunities, they must be in a position to face their counterparts in any corner of the world while keeping their heads high by virtue of their hard work and their dexterity of hands and win the hearts of people around the world through their skills. We want to go for the capacity building of such young people. My brothers and sisters, having taken a resolution to enhance the skill development at a highly rapid pace, I want to accomplish this.

*-Hon'ble Prime Minister of India, Shri Narendra Modi*

## Introduction

The Government has initiated the process of formulating a New Education Policy to meet the changing dynamics of the population's requirement with regard to quality education, innovation and research, aiming to make India a knowledge super power by equipping its students with the necessary skills and knowledge and to eliminate the shortage of manpower in science, technology, academics and industry. The New Education Policy (2015) task force has identified twenty themes on higher education for consultation. Integrating skill development in higher education is one among them. Developing skills among the students is very important for the socioeconomic development of our country.

Today, India is one of the youngest nations in the world with more than 62% of its population in the working age group (15-59 years), and more than 54% of its total population under 25 years of age. Its population pyramid is expected to "bulge" across the 15-59 age group over the next decade. It is further estimated that the average age of the population in India by 2020 will be 29 years as against 40 years in the USA, 46 years in Europe and 47 years in Japan. In fact, during the next 20 years the labour force in the industrialized world is expected to decline by 4%, while in India it will increase by 32%. This poses a formidable challenge and a huge

opportunity. To reap this demographic dividend which is expected to last for next 25 years, India needs to equip its workforce with employable skills and knowledge so that they can contribute substantively to the economic growth of the country.

The World Economic Forum's Global Talent Risk report (2011) cautions that developing countries like India and Brazil will face huge skill gaps due to low employability. India can reap the benefits of this situation only by effectively skilling and up- skilling its vast manpower by mainstreaming vocational education, modules of finishing schools and partnership of industry-academia in the curriculum of higher education.

### Need for Skill Development

The percentage of employers facing difficulty in finding skilled workforce is as high as 81 percent in Japan, 71 percent in Brazil, 49 percent in US, 48 percent in India and 42 percent in Germany. One wonders what it that we are turning out is from our universities and colleges. Even for India- the youngest country in the world, if the percentage is 48 per cent, it is an alarming situation, to put it mildly, because it means that half of our companies and businesses are finding it difficult to run their daily operations due to the lack of skilled workforce. India has the largest number of young people (age group of 14-25) and the highest global unemployment rate - these are pointers to the nature and efficiency of our education system. Against this, the job market is increasingly being redefined by specific skills. The entire skills set required to work in a company that competes at the global level has undergone change, and education, particularly Higher Education, cannot afford to overlook the new realities of the 2nd decade of the 21st century. Across the world, skills development has been addressed with considerable seriousness. According to figures of 2008, the percentage of workforce receiving skills training is 96 percent in Korea, 80 percent in Japan, 75 percent in Germany, 68 percent in England and 10 percent in India. Moreover, it is estimated that 75 percent of the new job opportunities to be created in India will be skill-based. While the skill set has changed and employers look more and more for 21st century skills in the job seekers, it is required to take a close look at the academic nature of our curricula and their mode of transaction. It is not that we do not have enough degree holders in the country; we have a number of them, but the world of business and industry thinks that they are not employable. Surveys and studies are

conducted at regular intervals and it is reiterated in the surveys and studies that the 80 per cent workforce in rural and urban India does not possess any identifiable employability skills.

The NASSCOM-McKinsey report "Perspective 2020: Transform Business, Transform India" (2009) said that only 26 percent of India's engineering graduates were employable.

An Associated Chambers of Commerce and Industry of India (ASSOCHAM) survey reported that only 10% of Master of Business Administration (MBA) graduates from Indian business schools get a job right after completing their course (2012). These reports and many others indicate that the employability or non-employability of Indian graduates is a rising concern. Leaders of business and industry in India have regularly voiced their concern over the lack of skilled manpower ready to be absorbed in various sectors. We have the government intervening by establishing a National Skills Development Council (NSDC) and several other skills development initiatives in the pipeline, but unless our higher education wakes up to this and responds proactively, the youths coming out of it would find it hard to claim a place in the world, and thus the growth of this country will also remain under threat because without the requisite human resource the magic growth is impossible.

In a large country like India, only government agencies and system cannot accomplish this task of up Skilling the youth. Private companies with requisite experience in skills training may also be roped in to expedite the process of enhancing the skills development of youth in colleges and universities. In today's world, particularly in India, the future and relevance of higher education are inextricably linked with skills development; the earlier, higher education accepts this and acts accordingly, the better it is for the country and its growth. Skills Development is not an additional course that can be added to a university curriculum, but it requires to be integrated into the training and education of a youth who will have to be readily employable and competent enough to run the operations of a company or business in India. A youth seeking job in the market today is expected to have salient life and soft skills which he has no clue about till she/he faces an interview.

Higher education does little to address the skills requirement of a youth raring to go into the world and make a mark. To make it amply clear as to how higher education has got to address the issue of skills development and employability, no better evidence than what Planning Commission's Approach Paper to the Twelfth Five Year Plan says: "There is a need for a clear focus on improving the

employability of graduates. Indian higher education is organized into 'General' and 'Professional' streams. General education which is an excellent foundation for successful knowledge based careers, often fails to equip graduates with necessary work skills due to its poor quality. Graduates now require the skills beyond the basics of reading, writing and arithmetic. Skills such as critical thinking and creativity are now important in more and more jobs. Special emphasis on verbal and written communication skills, especially in English would go a long way in improving the employability of the large and growing mass of disempowered youth."

### Reasons for the Poor Employability of Indian Graduates

Experts have opined various reasons attributing to poor employability ranging from school education, selection procedure in our graduate colleges, curriculum and quality of teaching, student interest and lack of corporate involvement. Unfortunately, most of these reasons have some part to play in this huge challenge.

Our approach has been to create an ecosystem to help identify employability gaps, provide quantitative and qualitative feedback at various levels, be it an individual, institutional, regional or national level to help bridge the employability gap in a constructive manner.

What are the main traits that employers look for when hiring graduates?

The employers look at a mix of aptitude, language, personality and domain skills in selecting the right candidates for various roles in their organization. The detailed fine-tuning happens based on the job role and the industry they are recruiting for. While core domain skill requirements vary from industry to industry, aptitude, language and personality skills requirements change from role to role.

### Conclusion

Policy papers in India are beginning to show their commitment to skills development and employability through it but that is not enough either. The true reflection of their commitment would be when they make it mandatory to establish Skill Development Centers at university and college campuses and provide specific funds for the same. These Centers should be endowed with the task



of training each and every student of the college and university in terms of soft skills and life skills and prepare them for the jobs they dream of.

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## Teaching Research Methods in the Humanities and Social Sciences -How to do Case Study Research

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There are multiple definitions and understandings of the case study. According to Bromley (1990), it is a “systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest” (p. 302). The unit of analysis can vary from an individual to a corporation. While there is utility in applying this method retrospectively, it is most often used prospectively. Data come largely from documentation, archival records, interviews, direct observations, participant observation and physical artifacts (Yin, 1994). The terms “case study”, “case review” and “case report” are used loosely in the scientific and professional literature. The key features of a “case study” are its scientific credentials and its evidence base for professional applications.

A “case review” might emphasize a critical reappraisal of a case. A “case report” might refer to a summary of a case or to the document reporting a case, as in case law or medicine. Case studies of individuals in health care research (to take one example) often involve in-depth interviews with participants and key informants, review of the medical records, observation, and excerpts from patients’ personal writings and diaries. Case studies in nursing, for example, have a practical function in that they can be immediately

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*A publication of Muslim College of Education,  
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applicable to the participant's diagnosis or treatment. Case study as a research method is often indexed in most undergraduate research textbooks as neither quantitative nor qualitative. Little attention is paid to the usefulness of this method, with an average of two pages devoted to this research approach (Burns & Grove, 1999). This chapter will provide a step-by-step guide to this research method. The goal of this chapter is to translate this step-wise approach into a "curriculum" for teaching case study method.

## In Preparation

Case study method is indexed in many introductory research textbooks and is often taught in qualitative research methods courses that discuss a variety of methods. These may include grounded theory, phenomenology, discourse analysis and case study, for example. Reasonable goals for the learner would be to explore and understand the philosophical and aesthetic paradigms that are foundational to qualitative research methods, compare and contrast the distinctions among selected methods, evaluate traditional and emerging qualitative designs within their disciplinary area, and to apply methods and techniques. Using a step-wise approach students will learn how to design studies, generate data, analyze and interpret the data and disseminate findings. The teacher creates a teaching and learning environment to meet those outcomes. Pedagogical approaches commonly blend learning and doing; these include seminar participation wherein students are responsible for researching and presenting a didactic lesson, discussing and critiquing qualitative research reports, engaging in field work activities, presenting findings to their class and writing a report. In most cases generating a proposal for the review of human subjects and obtaining university approval for the field experience is required.

## Prior to Beginning

Students should form a list of possible methods in their mind when reviewing their research question, and ask how can I get the information I am looking for? There are many considerations prior to embarking on case study method but at the onset it should be clear that no other descriptive method is possible or will get the level of

description the researcher is looking for, except case study method. Time in the field, lengthy interviews and transcription and analysis are all factors that should be thought out well in advance of engaging with participants. In teaching case study method a primary aim is to define what case study is and what it is not. Various authors of case study methods discuss and demonstrate a variety of paradigmatic perspectives. I will discuss the most commonly cited perspectives. According to Yin (1994) the case study design must have five components: the research question(s), its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions and criteria to interpret the findings. Yin concluded that operationally defining the unit of analysis assists with replication and efforts at case comparison.

Stake (1995) emphasized that the number and type of case studies depends upon the purpose of the inquiry: an instrumental case study is used to provide insight into an issue; an intrinsic case study is undertaken to gain a deeper understanding of the case; and the collective case study is the study of a number of cases in order to inquire into a particular phenomenon. Stake recognizes that there are many other types of case studies based on their specific purpose, such as the teaching case study or the biography. Feigin, Orum and Sjoberg (1991) state that irrespective of the purpose, unit of analysis, or design, rigour is a central concern. They suggest that, while proponents of multiple case studies may argue for replication, using more than one case may dilute the importance and meaning of the single case. Yin (1994) points out that case studies are the preferred strategy when “how” and “why” questions are posed. Guba and Lincoln (1981) describe case study “types”. These types are factual, interpretative and evaluative. Each case study must outline the purpose, then depending on the type of case study and the actions proposed by the researcher, the researcher could determine the possible products of the study. For example, research undertaken to describe men’s experience in living with chronic coronary heart disease (CHD) could be placed in both factual and interpretative categories (Zucker, 2001). The researcher’s actions include recording, constructing and presenting, and producing a chronicle, a profile or facts. Additionally, the researcher is construing, synthesizing and clarifying, and producing a history, meanings and understandings. A student’s understanding of such activities helps him/her form the stages of the case study method. In summary the purposes of case study research may be exploratory, descriptive, interpretive and explanatory (Mariano, 1993). Articulating the purpose of the research will inform the remainder of the case study design.

## Strategies

In order for students to develop some confidence and competence in learning case study method a variety of tools are made available for student examination, use and critique. Yin (1994) offers a very straightforward protocol approach for case study emphasizing field procedures, case study questions, and a guide for the final write up. This “tool” is intended to 1) assist the researcher carry out the case study and 2) increase reliability of the research. Similarly Stake (1995) has proposed a series of necessary steps for completing the case method, including posing research questions, gathering data, data analysis and interpretation. A remarkable distinction is Stakes’ emphasis on a more naturalistic approach, the importance of the philosophical underpinnings of case method, and the importance of the description of contexts. Developing a protocol will serve as a frame of operation and include all the necessary elements in the proper conduct of students’ research. The following list illustrates a common case study protocol that guides the researcher’s methodology:

- Purpose and rationale for case study
- Significance of the phenomena of interest
- Research questions
- Design based on the unit of analysis and research purpose
- Data collection and management techniques
- Field methods
- Transcribed notes and interviews
- Mapping of major concepts
- Building typologies
- Member checking
- Describe the full case
- Focus the analysis built on themes linked to purpose and unit of analysis
- Case perspective
- Disciplinary perspective
- Cross-case comparison
- Write up the case from an emic perspective
- Biography, autobiography, narratives
- Establishing rigor
- Credibility
- Transferability
- Dependability

- Confirmability

Developing a protocol will serve as a frame of operation and include all the necessary elements in the proper conduct of students' research.

## Sample

Another important component in teaching case study method is to emphasize unit of analysis and description of the sample. When the unit of analysis is an individual, for example, an important concept to consider is life history. Bromley states, "The case study emphasizes the proximal causes of the behaviour and circumstances, whereas life history emphasizes the remote origins, and the continuities and discontinuities in the organization of behaviour over a relatively long period of time" (1991, p. 86). According to Stake (1995) the case study researcher may be somewhat of a biographer focused on a phase or segment of the life of an individual. Various reports in psychology (Bromley, 1986), sociology (Creswell, 1997; Yin, 1984, 1994), and education (Stake, 1978, 1995) have studied the individual as the unit of analysis, and have used the case study method to develop rich and comprehensive understandings about people. Yin (1994) describes single and multiple case designs. One rationale for these designs is to identify an extreme or unique case. The single case may focus on/employ a single unit of analysis or multiple units of analysis. This contrasts to multiple (comparative) case studies, which Yin describes as analogous to multiple experiments; they follow a "replication logic." The "logic" underlying the use of multiple-case studies is: each case must be selected so that it either 1) predicts similar results (a literal replication) or 2) produces contrasting results but for predictable reasons (a theoretical replication) (Lee, 2006).

## Methods and Analysis: Iterative Processes

An important component of teaching case method is to allow students an opportunity to move in and out of the literature before, during and after the case study has begun. It is important for students to understand that method and analysis occur simultaneously in case study research. For the remainder of this

discussion this example will focus the reader on the following three stages to illustrate this

process:

Stage 1 - Describing Experience

Stage 2 - Describing Meaning

Stage 3 - Focus of the Analysis

Stage 1 - Describing Experience

In this stage the researcher creates interview questions prior to the first interview, which serve as a script for moving the interviewer closer to eliciting experience and meaning from participants in each succeeding interview. The questions should be broad and loosely structured, following the intent of the research questions. Using techniques suggested by Schatzman and Strauss (1973) journals and logs are kept to track methodological, observational and theoretical field notes during data collection.

Next, the interview questions are accompanied by a list of possible sources of data. Using the example of describing the experience of living with chronic CHD across 10 to 15 years, a list of potential sources was made that included the participant, his spouse, physicians, and nurses and other possible significant key informants. The medical records in at least three settings had to be located; hospital archives, doctors' offices and outpatient rehabilitation centres and clinics. The medical and nursing literature can be a rich source of information on patient experiences in the form of standards of practice, most of them in classic texts that are updated every one to three years. Additional standards were found in published discipline-specific guidelines. Because experience across time was an important feature of this study, the researcher had to be mindful of advances in cardiac interventions after 1985. Experts were consulted from nursing and medicine to validate the current standard of care. Finally, the literature was reviewed for definitions of experience, particularly as they related to chronic CHD. For example, Strauss and colleagues (1984) and Miller(1992) referred to patients' illness experiences as their illness trajectory. Literature from the disciplines of nursing and medicine revealed a common trajectory for patients with CHD. The literature was revisited between interviews to gain a better understanding of new data. Clear conceptualizations assisted in taking definitions into the study, and combined with the other sources of data, comprised the mass of data available to study the phenomenon of interest. Thinking in metaphors, and creating simplistic models and thematic maps were essential activities in data management.

Mapping the data from multiple data sources is an important task. In this study, principal data were derived from two to three lengthy interviews lasting from two to two and one half hours. Assembling tables, charts and grids assisted with clustering of concepts. For example, after the first two interviews it became clear that acute cardiac experiences did not occur in isolation, rather three large dimensions of experience emerged. Experience was coded by colour in the transcripts; for example, red for cardiac experiences, green for health and illness experiences, and blue for life experiences. Various perspectives were bolded (spouse) or underlined (nurse or doctor) to distinguish them from the patients' (normal typeface). Finally, all of these data sources were read, summarized and organized. Interviews were transcribed by a professional transcriptionist. Early models such as the one seen in Figure 2 were constructed to assist in conceptualizing dimensions and ideas that clustered together.

## Mapping Experience

Experiences were further categorized as physiological, sociological and psychological within each dimension. Colour codes, taxonomies and chronological ordering was used to manage the data that were assembled in large tables first on newsprint, then in the word processor. Stage

## Describing Meaning

In this stage the researcher consults the literature and links the research questions and methods to the philosophical framework.

Because the meaning of experience was also central to this study, the literature on meaning that had the most relevance for this population was reviewed. Multiple perspectives were reviewed from social constructionism, medical sociology, existential analysis and symbolic interactionism. Processes similar to those used to explore and describe experience were used to study the importance of the concept of meaning. Burbank (1988) studied the meaning in life of older adults from a symbolic interaction perspective, and described a hierarchical model of meaning. The first level is labelled "meaning of signs and symbols" and represents a micro-level perspective on meaning. This level is considered a foundation or beginning of



creating meaning. For patients with CHD this may refer to what they see and read in print or in the visual inspection of persons with known heart disease. Powerful words such as "CPR", "Chest pain" or "MI" are a few that convey meanings about absolute life and death.

The second level is "meaning of people, things and events in a person's life." This "mid-level" of meaning builds on the first and assumes that "a variety of things may be meaningful in varying degrees to different people" (Burbank, 1988, p. 13). Meaning in life for patients with CHD may correspond to the crises or episodes of illness, significant others before, during or after the illness, and quality of life issues which include work, intimacy and freedom to live according to one's own desires. Examples of events or treatments include angioplasty, stents and heart surgery. The final level of meaning is an abstract, macro-level, labelled "the meaning of life as a whole." Individuals may have no conscious awareness of this level of meaning, but rather function within a set of values and beliefs about life's meaning. This existential or cosmic meaning differs from the query, "what is the meaning of my own life" which reflects one's need to have purpose in living. The latter may assist the patient with CHD to plan for the future given his current physical and psychological circumstances. Burbank equates "meaning of life" as a whole, as interrelated to the other two levels and is seen as one's worldview. In conclusion these levels of meaning may encompass humankind's capacity to find importance in the experiences of living.

In the study of CHD patients' experiences, the midlevel of meaning was most helpful due to the preponderance of participants' events and situations noted in the transcripts, archives and medical records, as well as interactions with others and self. Burbank's model was not fully supported in this study, as there were periods when no meaning could be found in either of the cases. Again the use of a simple model assists in pulling together data from the case study and tying it to meaning making. In this instance support from existential analysis was helpful. See Figure 3 for a basic model of meaning based on Burbank's work. Mapping Meaning (Based on Burbank, 1988) Interestingly, in the case study of the experience and meaning of men living with chronic CHD, two cases emerged that differed widely, one being the more "textbook" case, the other the more idiosyncratic. Rather than following a traditional approach to case analysis using replication logic (Yin, 1994), efforts were focused on drawing comparisons between the two cases. Prior to analyzing instances of meaning from these cases, the original transcripts were once again reviewed and marked with a small "m" for each instance of meaning. Particular words, sentences, and passages were noted in a separate journal. Interpretations of what

patients were thinking, doing and feeling added to an understanding of the meaning of their experiences. This experience of reading and rereading, refining the methodology as data is received as an important set of activities in case study research.

### Focus of the Analysis

Generalization of case study findings is limited to the case itself or types of cases. However, attention to selected details enhances the analysis and increases clarity of reasoning. Some general techniques are mentioned that have been useful in focusing the analysis of the example used here. According to Yin (1994) analysis hinges on linking the data to the propositions and explicating the criteria by which findings are to be interpreted. While generalization limits the use of case study method by some social scientists, Yin (1984) argues that theoretical generalization is to the domain of case study what statistical generalization is to the true experiment. An important technique used to incorporate rigour into the study design is the use of the negative case to serve as a study "control". The use of the extreme case, the deviant case, and the normal case are helpful for making points of comparison.

The stand taken by Stake (1978) focuses on context-specific or "naturalistic" generalization. Such an approach resonates with readers' tacit knowledge, which helps people make connections and associations without the benefit of words. It is believed that people have the capacity for this kind of knowledge, and from it they build understandings. In the example of the experience and meaning of men with chronic CHD, major themes identified with the use of maps and typologies emerged as focal areas of the analysis. The metaphor "journey" became a central organizing concept, and was linked to a variety of sub- concepts, and relationships among them were sought. Two complete cases were reviewed. Each case was analysed separately with an eye toward describing experience and meaning. According to Feigin, Orum and Sjoberg's (1991) description, one appeared as a "normal" case and one an "extreme" case. The strategy was to focus the analysis on the journey, by concentrating on how it: 1) was tied to a physiologic state, 2) carried consequences and 3) compared with the typical health/illness trajectory.

### Examining Rigour

It is the role of the case study researcher to test and confirm his/her findings in order to indicate the findings are valid and the

procedures are rigorous. Rigour is built into this process by focusing the strategies used to generate meaning from the qualitative data. See Table 2 for these strategies. Those strategies in italics were selected for the example case study.

Investigators within a constructivist paradigm, such as that used by case study research, attempt to reconstruct participants' understanding of the social world (Denzin & Lincoln, 2000). Thus, traditional criteria of internal and external validity are replaced by such terms as trustworthiness and authenticity. Guba and Lincoln (1981) suggest an alternate view of establishing rigour based on a critical realist paradigm that is juxtaposed to a more traditional view. In this case reliability is contrasted with dependability or auditability.

In this sense we are asking if the researcher's processes were consistent and reasonably stable over time and across researchers and methods. Internal validity can be contrasted with credibility or authenticity. Here we aim to answer the questions, do the findings of the study make sense? Are they credible to the people we study themselves or others? Finally, we want to know if our conclusions are transferable to other contexts? How far can they be generalized? Here we contrast external validity to transferability or fittingness (Miles & Huberman, 1994).

Quality standards for case studies in psychology, for example, have been developed emphasizing the scientific and professional benefits to other disciplines. Fishman (1999) describes such standards, outlining quality of knowledge issues across three paradigms: the positivist model, the pragmatic model and the hermeneutic model. Procedural guidelines for fulfilling these criteria rely heavily on methodological arguments and techniques - sampling diversity, triangulation or agreement, and monitoring bias. Lincoln (1995) argues that quality also involves ethics. The researcher's decision whether to embark upon the research must be considered in relation to the risk of harm to participants or their families. Using an outside auditor is required to check each step as the case study is developing. Thus attention to quality control must be incorporated into the case study protocol.

## Writing Up the Case

There are some suggestions new case study researchers may find useful prior to writing up their findings. The first is to spend some time at the outset reading "good" case studies. Course assignments should include adequate time and support for students to complete pilot studies and practice writing, both excellent ways to develop the "artistic" expertise required of such writing. Other strategies include

joining a writing group, participating in writing retreats and soliciting English or literature experts to begin reading one's writing. Decisions about writing style will become clearer as the intent of one's audience is determined. For example a narrative, biographical or autobiographical approach may be useful for dramatic effect, while a full description may be well suited to an organization. In any event, the goal is to tell the story and its findings clearly separated from conclusions or interpretations.

In the example of the experience and meaning of men living with chronic CHD, the writing began with a review of the stages of analysis. The first stage defined the typical trajectory and mapped the cases' experiences. Definitions came from the literature, experience, and nursing practice. Patient interviews and other sources of information revealed three phases of experiences common to patients with CHD. Exploration of interview data and medical records uncovered three dimensions of experience and three categories of experience that could be viewed within each dimension. This analytic stage also ordered the data chronologically and placed them within the frame of reference of the data source.

The second stage of analysis focused on mapping meaning. Here theoretical support came from a model based on the symbolic interaction perspective. This model assisted in mapping the meaning demonstrated in the transcripts across the three phases of the trajectory and across the levels of meaning. The third stage focused the analysis on three important notions: how experience was tied to a physiologic state, how it carried consequences, and how it compared with the typical illness trajectory. Both case studies included in-depth descriptions of individuals whose adult lives had been significantly impacted by CHD.

Physiological processes, while central to experience, were only a portion of that experience. This level of analysis assisted in bringing together the notions of experience and meaning as seen within the context of life. Putting all the pieces together helped create a beginning model that informed the trajectory of living with chronic CHD. This process assisted in developing a logical chain of factors contributing to the understanding of the data. The result was a series of maps and typologies representing perspectives about the meaning of experience, from all data sources. A beginning model emerged describing the trajectory of chronic coronary heart disease. The "style" of the manuscript in this case was biographical using a chronological flow. Participants' own language was used whenever possible throughout the manuscript in an effort to retain the integrity of their stories and meanings.

## Conclusion

Case study method can be a creative alternative to traditional approaches to description (quantitative descriptive and descriptive correlational descriptive designs) emphasizing the participant's perspective as central to the process. In the example used here the value of the case study was the findings.

Theoretical implications informed nursing practice directly. Case study conclusions created opportunities for nurses to adapt their model of care to incorporate all three phases of the chronic illness trajectory. For example, changes in history taking and follow up as well as ongoing provision of support to the patient and family were emphasized.

At the organizational level such findings require resources and administrative action for implementing a transitional model of care. Other implications, no less important, include the impact of the method itself on moving description of a phenomenon to intervention. Finally, the utility of a case study is that it encourages educators to consider additional steps in a caring educational curriculum that emphasizes communication and relationships between human beings (Scott, 2005).

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## Curriculum Expectations and Teacher competences – An Empirical Study (based on Kerala TTC)

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Teacher Educators are key players in the endeavour to improve the quality of teacher Education and teaching. Those who are behind the curriculum designing envisage that the major components of the curriculum should be easily transacted or transmitted to the teacher trainees through Teacher Educators. However the competency level or performance of the Primary teacher who comes out of the TTC courses and join service were found to be quite unsatisfactory. This prompted the researcher to find out where and how this lacuna appears between curriculum designing and transaction. On a close study regarding the functioning of Teacher Training Institutes, it was found that the language English is the most neglected subject in TTC classroom transaction. The great paradox in the system is that there are no specialized English teachers to teach English for a professional course like TTC. Many of the TTC teachers met were bold enough to say that they were forced to take English for TTC which is not their subject. On an attempt to talk to the said English teachers in English language, majority of them bluntly rejected or opposed the idea and a few who dared went ahead with some great grammatical errors. The researcher was able to narrow down some of the reasons for this problem. Based on the analysis of these problems, several remedial measures have been suggested.

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Teacher Educators are key players in the endeavour to improve the quality of Teacher Education and teaching. Teacher Educators are role models. From them many teachers acquire the competences that they later display in classrooms. Knowledge, skills and values are often imbibed from the Teacher Educators by the Teacher Trainees. Teacher Educators have a dual role to be producers of Knowledge about education, Wherever the researcher went it was found that the TTC students were much engrossed in busily copying materials into their record Books. On a close study of the gathered information it was found that the children were busy completing their writing assignments. On a query raised about the copying of the assignments it was told that they had no time to refer and write things on their own. So an easy method is being adopted by collecting a well written record book or assignment book from seniors or some talented students and get it copied mechanically into their books. The students were even bold to tell that even their handwriting is not being improved by this process as they are racing against time in scribbling these words. Of course, there will be some exceptional children who are capable of doing these works on their own. However not much monitoring is happening in this regard by the Teacher Educators. Here only the ends are taken care and not the means.

The confusion among the Teacher Educators in the Teacher Training Institutes is mainly about who will have to bear the burden of teaching English to the students. In a few institutes the so called hapless English teachers asked a favour from the researcher to do something to get them freed from the clutches of English teaching. It is indeed disheartening to note that some Teacher Educators are forced and compelled to handle English classes.

With much reluctance and without a choice they are somehow trying to manage the situation. Maybe this is the only place where Teacher Educators openly expressed their inabilities and inadequacies in teaching English. The teachers who take English classes are not getting effective training in teaching the language. In the High Schools in Kerala from the year 2002, specially qualified and trained English teachers were appointed. But the TTC professional course which is much higher than the high school level is still being neglected with such arrangements, compromising mainly in the matter of English language teaching. Some students have even pointed out the disparities between the BRC trainer's version and their teacher's version especially in the matter of narration. The confidence level appears to be quite low among the Teacher Educators in English. The researcher was able to talk to around 40 Teacher Educators. Simple English was used in initiating

the conversation with them. Among the forty teacher educators, except one, all others responded in the mother tongue. Some tactful persuasion was given to them for assessing their speaking skills. However some of them obliged later with much difficulty and to the utter shock used the language with lot of grammatical errors. They were found realizing their mistakes and once that becomes obvious they were immediately resorting to the mother tongue. This was the case among the Trainees also. It was found that they were quite rhetoric in pointing the drawbacks of the system in the mother tongue. Several teachers talked about the good old days of the wonderful standards of English teaching. But ironically none among those teachers were able to speak the language and also failed to perform in the proficiency test.

### Proficiency Test

When the proficiency test paper was given to them their mood got completely changed. The questions were quite easy in the sense that it was aimed to find out some basic writing skills and some basic theoretical knowledge. Most of them were hesitant to do the task. Some outrightly refused to do it. Some said they need at least a day to answer those 8 questions. Around 10 teacher Educators brought it back home and returned it in the following day and also by post. In several tests, which was taken home it was found that the very handwriting was also different from theirs. This peculiar response and standards clearly denotes that these teacher Educators are not equipped enough to handle such English classes. In one Institute the teacher Educator in English completely failed to grasp the meaning of the word 'implication'. In the proficiency test it was asked to write about the implications of grading system in Kerala. Here the teacher wrote the grade points only on the answer column. To substantiate that when the test was administered in the TTC 2nd year classroom, the researcher found that the students were waiting without writing the answer for the first question. There were 24 students in the class. None among them knew the meaning of the word 'implication'. This word is very much there in their curriculum in repeated contexts. Another deplorable condition in the system is that some of the teacher Educators are hiring some English graduates to come and take class for certain topics like phonetics, stress and intonation. But the Teacher Trainees are not at all happy with these kinds of adjustments. In Every Institute, the trainees were complaining about the difficult theoretical terms and the condition in which their teachers fail to explain it clearly to them.



The mechanical copying and writing of the assignments is the major task going on in the Institutes.

In classrooms, English is not being used. All the explanations are given in mother tongue. Effective communication in English is not happening in classrooms. Dynamic questioning is an unfulfilled envisaged thing. Most of the Teacher trainees feel that the teaching practice sessions allotted to them are insufficient. They have raised the general complaint that the regular teachers from the respective schools are compelling the trainees to conduct classes according to their suggestion. Majority of the students are not liking the way in which English is being handled in the class. They feel they need a prescribed text book for the proper grasping of English. They have complaints that demo model classes are not taken by the Teacher Educators before they are sent to the schools for teaching practice.

### Appointment of Teacher Educators

Teacher Educators in the teacher training Institutes are appointed from High School teachers barring the DIETS. But even in DIETS there are no special English Lecturer post. Normally seniority becomes the criterion in the selection of Teacher Educators. In this system there are no English teachers to conduct class for the Trainees. Any other teacher needs to take this challenge of venturing into the world of English. English has gained this much prominence in the present world and still a professional course like the Teachers training course is left unattended in this matter. Even the High schools are having specially trained qualified English teachers now. Thus the teachers who are destined to take English are struggling hard with the English curriculum and its requirements. They themselves feel that when the final evaluation was streamlined a bit there were quite a lot of failures for the TTC examination. If the evaluation process is standardized then the rate of failures in English will be very high. The teachers who are handling English for TTC students were found committing such a lot of pronunciation errors. This modeling is sure to affect adversely the students.

### Use of other materials in teaching and learning English

Libraries are seen much underutilized. Each and every student gets worried about the time restraints in completing the assignments. In

several institutes it was found that the students in the class were left alone by the teacher for the students to complete their writing tasks. In the survey it was found that hardly 2% of the teacher Educators read English dailies. They are not even in the habit of watching any English programme in the visual media. Computers and net facilities were seen underutilized.

## Suggestions

It is found that only few teachers are handling English properly in classrooms. When teachers do their English, it is found to be marred by grammatical errors, pidginization and incomplete utterances. In a language situation like this, where the teachers have very little to offer to their learners, what is feasible and likely to produce results is a methodology that makes the best use of the language of the text. Or else the teacher needs special training in using the language with proper stress intonation and pauses. An effective training that helps the teacher Educators to pick some good English for themselves as they teach. Teacher Educators need to be well versed in theories also. Let me quote Wardhough (1969) "we can never ignore theory in talking about classroom practices, because good practices must necessarily be built in good theory. Every classroom practice that we have, derives from an underlying theory of some kind." Hence some measures need to be taken to train the present teacher Educators in the various facets of the theories and its implementation level. Language acquisition is so varied and so complex a psychological function that no single theory has ever been successful in explaining it fully. In the peculiar context here the learners as well as the teacher educators are just beginners Recent Researchers Light brown and Spada (1993) have re-established the significance of corrective feedback in ESL teaching. Hence there should be some regular monitoring, support activities and corrective feedback need to be given to the Teacher Educators very frequently.

## Role of a teacher in a communicative language teaching method

In this method the role of Educator is more demanding. The roles range from controller of the class to a participant, an organizer a

resource person and an assessor. The teacher educator has to be multifaceted. Teacher Educator becomes a language facilitator.

Curriculum and language learning impacts Before we introduce any change in the learner's curriculum the teachers need to oriented towards the curriculum. Further, the ability of our Teacher Educator's conversational ability in English which is vital for translating the curriculum into classroom activities needs to be developed. Equipping the learners to use a language for communication is the primary aim of learning it. Only a communicative oriented curriculum can make the learning of the language relevant and purposeful.

### General Suggestions

1. New teaching learning centres need to be established and they should act as laboratories for the theory and practice of the teacher training.
2. Pre-service and In-service teacher training need to be made inseparable. Continuing professional development strategies need to be envisaged and implemented.
3. The status of Teacher Educator needs to be uplifted in the ways of better wages and better title designation.
4. Teacher Educators should be given a clear chance in framing the curriculum.
5. DIET faculty members and Teacher Educators may be appointed based on their academic performance
6. The course should also be extended for three years leaving much scope for teaching practice.
7. After the completion of TTC course a bond period can be fixed for the teachers willing, to carry on with the strategies learned.
8. English language teachers with English
9. bachelor degree and masters degree along with training qualifications need
1. only be appointed as teacher Educators in English In TTI's.
2. Absence of professional preparation is
3. visible among Teacher Educators. Periodical professional enhancement
4. programmes need to be conducted.
5. Teacher Educators need to be trained to be reflective practitioners. They should also teach the students to be critical observers.

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## Challenges of Agricultural Commodity Markets in Kerala

### (A case study of agricultural market in Anayara, Thiruvananthapuram)

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The present paper attempts to identify the problems of the Agricultural Commodity markets in Kerala with particular reference to Anayara whole sale Agricultural Commodity market in Thiruvananthapuram City. It also identifies the problems experienced by the proprietors of the participant business units in the Market. The paper is mainly based on the primary data collected from the officials of the whole sale Agricultural Commodity market as well as the proprietors of the participant business units. The data were collected with the help of a pre-tested structural interview schedule. A survey was conducted among the proprietors of the selected 25 units functioning in the wholesale Agricultural market at Anayara in Thiruvananthapuram City. The major problems experienced by the facilitator of the services in the market are delay in collecting rent from the occupants, locational disadvantage, Labour problems, Existence of well organized markets in the central places of the city and Problem of Bad Debts.

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The Chief Problems of the Occupant Business Units are Locational Problems, Absence of Customer Awareness about the functioning of the Market, Inadequate inflow of Agricultural commodities in the Market, Lack of Interest in Agricultural Activities among the youth in Kerala also restricts the inflow of Agricultural Commodities to the Agricultural Commodity market, High cost of production of Agricultural commodities in the State and the interference of trade unions.

Indian Economy is mainly an Agrarian economy. India is a vast country with approximately 3.6 lakhs villages. Agriculture is the main occupation of the people residing in villages.

However, in recent years the significance of agricultural activities has declined considerably on account of various reasons. Now, the land area earmarked for agricultural activities becomes meager and the people in the country are forced to consume substitutes for agricultural products.

The commodity market comprises all palpable markets that we come across in our daily life. These markets cater the needs of consumers through exchange of goods for money. The Indian commodity market can be divided into two categories namely Wholesale market and Retail market. Under the whole sale market, the Wholesalers buy goods from farmers and manufacturers directly and sell the goods to the Retailers. The Retailers finally sell the goods to the ultimate Consumers. Recently, Indian commodity market is mainly concentrated in Retail Sector. All most every commodity under the sun both agricultural and industrial are now being provided as well as distributed by retail outlets throughout the country.

In Kerala, six wholesale Agricultural commodity markets are functioning. They are situated in the following places.

1. Anayara, Thiruvananthapuram
2. Marad, Ernakulam
3. Vengeri, Kozhikode
4. Nedumangad (Trivandrum Dist)
5. Muvattupuzha (Ernakulam District)
6. Sulthan Batheri (Wayanad District)

Out of these, the first three are urban wholesale commodity markets and the rest are Rural Agricultural commodity markets.

## Objectives of the Paper

1. The main objectives of the present paper are
2. To identify the problems experienced by the facilitators of services of wholesale Agricultural Commodity Markets.
3. To identify the problems of the participant business units in the whole sale Agricultural commodity market and
4. To suggest suitable measures based on the findings of the study.

## Methodology and Database

The present study is confined to the Anayara Urban Agricultural Commodity market located in Thiruvananthapuram City. The paper is mainly based on the primary data collected from the officials of the whole sale Agricultural Commodity market as well as the proprietors of the participant business units. The data were collected with the help of a pre-tested structural interview schedule. A survey was conducted among the proprietors of the selected 25 units functioning in the wholesale Agricultural market at Anayara in Thiruvananthapuram City. The data collected were analyzed to suit the requirements of the study. Secondary Data were also collected and used for the preparation of the present paper. The major sources of the secondary Data are Books, Journals, Study reports, Seminar papers, Electronic sources etc.

## Results of the Survey

The results of the primary survey are summarized below.

### A. Problems of Facilitators of Services in the Wholesale Agriculture Commodity Market

The Department of Agriculture, Government of Kerala is the facilitator of various services to the participant units. The Department offers the following facilities.

- Go down
- Electricity and Water Dormitory for farmers
- Canteen

- Storage facilities
- Parking facility
- Infrastructure facilities like Road, Telephone etc.

The primary data reveals that the following are the major problems of the facilitator of services. Delay in collecting Rent from occupants. The occupants of the various stalls in the whole sale Agriculture market are not prompt in remitting rent to the Department, even though the rent amount is very meager. They give flimsy reasons for the nonpayment of rent promptly. Abrupt Discontinuation of the contract made between facilitator and occupants. Certain occupants may discontinue the contract they entered into with the facilitator. Usually, they vacate the site without informing the reason for discontinuation to the officials concerned. This usually creates chaos among the facilitating officials. Locational Disadvantage The wholesale Agricultural commodity market at Anayara is located far away from the main centres of the Thiruvananthapuram city. This will create many hardships to the people ie mainly to the dealers and customers.

### Labour Problems

Even though this market is a union free zone, Labour Problems are not rare. Due to its frequency is quite large, many occupants are forced to give up the idea of running business ambitiously. Existence of well-organized markets in the Central Places of the city Chalai is one of the well-established Agricultural Commodity markets in the Thiruvananthapuram city. It caters all most all needs of the customers residing in and around the city. This will create a negative impact for the growth of the Anayara whole sale Agricultural commodity market.

### Problem of Bad Debts

The facilitator is always facing the problem in collecting amounts due from the occupant units on account of various dues such as rent, electricity, water charges etc. A huge amount of Bad debts always makes the operations of the facilitator of the market difficult.

**B. Problems of the Occupant Business Units** From the primary data, it is found that 84 stalls are offered by the facilitator to the



tenants. Out of these 84 stalls, only 70 are occupied by various tenant units. However, during the current year it has been found that only 52 stalls are functioning. The survey conducted among the selected 25 occupant units shows that they are experiencing the following problems.

### Locational Problems

Since the units are located far away from the city and transportation facilities are not frequent, the inflow of the customers is very poor. This is a serious setback experienced by the occupant units.

### Absence of Customer Awareness about the functioning of the Market

Majority of the customers are not aware of the ware about of the whole sale Agricultural commodity market functioning in the Thiruvananthapuram city. As a result, the occupants of the units in the market face poor customer response and subsequent dip in their sales turnover. Inadequate Inflow of Agricultural commodities in the Market The state of Kerala is depending to the neighboring states particularly Tamil Nadu for its requirements of Agricultural products. However, agricultural commodities from Tamil Nadu usually reach in Chalai Market in the city. As a result the inflow of many agricultural commodities to this market is not adequate and also very poor. Lack of Interest in Agricultural Activities among the youth in Kerala also restricts the inflow of Agricultural Commodities to the whole sale Agricultural Commodity market. In Kerala, the cost of production of Agricultural commodities is more on account of different reasons such as high labour cost, shortage of cultivable land and so on. This also affects adversely the flow of goods to the whole sale Agricultural Commodity market. The interference of trade unions affects adversely the smooth running of the occupant units in the world market.

### Suggestions

The following suggestions are offered to minimize the above mentioned problems.

(1) It is a statutory obligation for the occupant units to remit the meagre amount of rent charged by the facilitator. Therefore, they should impose self restriction to pay rent regularly. (2) Strict action may be imposed on those units who are absconding from the scene after executing the contract. Legal action as well as fines may be imposed to discourage this practice among the occupant units. (3) In order to minimize the locational disadvantage of the market the following measures may be implemented usefully. Frequent Bus Services to the Market may be introduced. (4) More Government offices may bel Chalai market may be shifted to the whole sale Agricultural commodity market at Anayara in a phased manner. (5) Onam fairs and other festival fairs like Christmas fair, Easter fair etc. may be organized in the wholesale Agricultural commodity market to attract more customers.

In order to make the farmers and customers aware about the operations of the wholesale Agricultural Commodity market, frequent meetings of these groups may be organized in Krishi Bhavans. For increasing the turnover of the units, waiving of Cess charged on the products for sale is an immense help to them.

## Conclusion

Since the Agricultural activities in the state are diminishing considerably day by day, the whole sale Agricultural Commodity market can play a crucial role in balancing the demand and supply of Agricultural Products in the state. These markets are providing acceptable flat forms for both the buyers and sellers to execute dealings with a mind of more satisfaction. The authorities are giving due importance for the development of these markets by considering their role and significance. This initiative should be continued with a more vigour and passion in order to achieve the mission fully.

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## A transition map method to find Overlay text

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A transition method find overlay text brings important semantic clues in video content analysis such as video information retrieval and summarization, since the content of the scene or the editor's intention can be well represented by using inserted text. The main aim of the research is to propose a novel framework to detect the Overlay text information in video frames. This method produces better than the previous methods. Resultant accuracy is highly improved.

### General Terms

Image processing covers a vast area of scientific and engineering knowledge. It is built on a foundation of one- and two-dimensional signal processing theory and overlaps with such disciplines as artificial intelligence (scene understanding), information theory (image coding), statistical image classification (pattern recognition), communication theory (image coding and transmission), and microelectronics (image sensors, image processing hardware).

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Broadly, image processing may be subdivided into the following categories: enhancement, restoration, coding, and understanding. The goal in the first three categories is to improve the pictorial information either in quality (for purposes of human interpretation) or in transmission efficiency. In the last category, the objective is to obtain a symbolic description of the scene, leading to autonomous machine reasoning and perception.

**Keywords:** Overlay text, Transition map, Inpaint, Video restoration, candidate region refinement, Sub patch method

## Introduction

With the development of video editing technology, there are growing uses of overlay text inserted into video contents to provide viewers with better visual understanding. Most broadcasting videos tend to increase the use of overlay text to convey more direct summary of semantics and deliver better viewing experience. For example, headlines summarize the reports in news videos and subtitles in the documentary drama help viewers understand the content. Sports videos also contain text describing the scores and team or player names. In general, text displayed in the videos can be classified into scene text and overlay text. Scene text occurs naturally in the background as a part of the scene, such as the advertising boards, banners, and so on. In contrast to that, overlay text is superimposed on the video scene and used to help viewers understanding. As a preliminary preparation, data will be collected as part of this research. The main aim of the research is to propose a novel framework to find the Overlay text information in video frames.

## Implementation

Lot of methods are already implemented for overlay text detection. Color based methods are not working properly because of un-uniform color distribution. Most of existing video text detection methods has been proposed on the basis of color, edge, and texture-based feature. The method proposed by Agnihotri [13], concentrates on the red color component, instead of all the 3 color components. Some methods used the high contrast video frames to extract the texts. Kim et al. [14] uses RGB color space and clustering concept. But no methods are fully efficient for clustering. So text detection is

not so better in this case. The edge based methods are not made success because of complex background. Modified edge map is introduced by Lyu et al. [15]. This is providing some improvement in overlay text detection.

## Methodology

### Transition Map Generation

As a rule of thumb, if the background of overlay text is dark, then the overlay text tends to be bright. On the contrary, the overlay text tends to be dark if the background of overlay text is bright. Therefore, there exists transient colors between overlay text and its adjacent background due to color bleeding, the intensities at the boundary of overlay text are observed to have the logarithmical change. The intensities of three consecutive pixels are decreasing logarithmically at the boundary of bright overlay text due to color bleeding by the lossy video compression. It is also observed that the intensities of three consecutive pixels increases exponentially at the boundary of dark overlay text. To find the intensity change in the transition region three steps are adopted. They are as follows:

1. Saturation calculation
2. Modified Saturation calculation
3. Transition map generation

If a pixel satisfies the logarithmical change constraint, three consecutive pixels centered by the current pixel are detected as the transition pixels and the transition map is generated.

### Video Frames

The difference of the previous frame's Transition map and current frame's transition map, decides whether to process the current frame or neglect the current frame. A threshold is used here for decision making.

### Candidate Map Region Detection

The transition map can be utilized as a useful indicator for the overlay text region. To generate the connected components, first

generate a linked map [5]. If a gap of consecutive pixels between two nonzero points in the same row is shorter than 7% of the image width, they are filled with 1s. Next the Hole filling algorithm is used to fill the small gaps and to maintain the connectivity. Then each connected component is reshaped to have smooth boundaries. Since it is reasonable to assume that the overlay text regions are generally in rectangular shapes, a rectangular bounding box is generated by linking four points, which correspond to  $(\min\_x, \min\_y)$ ,  $(\max\_x, \min\_y)$ ,  $(\min\_x, \max\_y)$ ,  $(\max\_x, \max\_y)$  taken from the link map and candidate regions.

### Overlay Text Region Determination

In this subsection, we introduce a texture-based approach for overlay text region determination. Based on the observation that intensity variation around the transition pixel is big due to complex structure of the overlay text, we employ the local binary pattern (LBP) introduced in [6] to describe the texture around the transition pixel. LBP is a very efficient and simple tool to represent the consistency of texture using only the intensity pattern. LBP forms the binary pattern using current pixel and it's all square neighbor pixels and can be converted into a decimal numbers as follows:

$$LBP_P = \sum_{i=0}^{P-1} s(g_i - g_c) 2^i$$

Where

$$s(x) = \begin{cases} 1, & x \geq 0 \\ 0, & x < 0 \end{cases}$$

P denote the user's chosen number of square neighbor pixels of a specific pixel.

$g_i$  -> neighbor pixels intensity.

$g_c$  -> intensity of current pixel.

### Overlay Text Marking

The rectangle bounding box is projected around the extracted overlay text region. Using the four corner points of candidate region we can mark the Text data.

## Results and Discussions

Most of existing video text detection methods has been proposed on the basis of color, edge, and texture-based feature. Color-based approaches assume that the video text is composed of a uniform color. However, it is rarely true that the overlay text consists of a uniform color due to degradation resulting from compression coding and low contrast between text and background. Edge-based approaches are also considered useful for overlay text detection since text regions contain rich edge information. The commonly adopted method is to apply an edge detector to the video frame and then identify regions with high edge density and strength. This method performs well if there is no complex background and it becomes less reliable as the scene contains more edges in the background. Texture-based approaches, such as the salient point detection and the wavelet transform, have also been used to detect the text regions. However, since it is almost impossible to detect text in a real video by using only one characteristic of text, some methods take advantage of combined features to detect video text.

### Sample Output



*Fig 1: Original Frame (Sample Frame)*





*Fig 2: Transition map generation*

## Conclusion

The various processes on overlay text detection from complex videos are proposed in this paper. The main concept of the work is based on the observation that there exist transient colors between inserted text and its adjacent background. We compute the density of transition pixels and the consistency of texture around the transition pixels to distinguish the overlay text regions from other candidate regions. The local binary pattern is used for the intensity variation around the transition pixel in the proposed method. The boundaries of the detected overlay text regions are localized accurately using the projection of overlay text pixels in the transition map. This research is well adopted in video data processing.

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## Parental Involvement: A Key For Children's Academic Performance

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Parental involvement is important for children, parents and society. Ongoing psychological and sociological research on parental involvement examines the impact of a particular measure or measures of involvement on a vast range of child progress indicators. These indicators are usually within the broad topics of child wellbeing, health, education and behaviour. Parent involvement in a child's education is consistently found to be positively associated with a child's academic performance. Parent involvement is a crucial force in children's development, learning, and success at school and in life. "parent involvement means the participation of parents in regular, two-way, and meaningful communication involving student academic learning and other school activities including ensuring that (a) parents play an integral role in assisting their child's learning; (b) parents are encouraged to be actively involved in their child's education at school; and (c) parents are full partners in their child's education and are included, as appropriate, in decision making and on advisory committees to

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assist in the education of their child". There are three broad types of parent involvement: involvement at home, involvement at school, and home-school communication. Communication is the key element that shapes parent involvement activities at home and at school and enhances school-family collaboration. Two-way communication between home and school helps build an on-going, productive, and trusting relationship between parents and educators, which increases parent participation in learning activities both at home and at school. There are several factors that affect the frequency and way in which parents become involved in their child's education at home and at school and collaborate with schools. This section will first provide an overview of such factors, and give parent and teacher perspectives.

**Key Words:** Parental involvement, Academic performance, influencing factors

## Introduction

Parent involvement is one factor that has been consistently related to a child's increased academic performance. While this relation between parent involvement and a child's academic performance is well established, studies have yet to examine *how* parent involvement increases a child's academic performance. The goal of the present study was to test two variables that may mediate, or explain how, parent involvement is related to a child's academic performance. Parent involvement was defined as the teacher's perception of "the positive attitude parents have towards their child's education, teacher, and school" (Webster-Stratton, 1998). Academic performance was measured by two methods: standardized achievement test scores and teacher report of academic performance through rating scales.

## Role of Parental Involvement in Education

The critical role of parental involvement in a child's education has been examined in countless studies and reports. The research overwhelmingly supports the following conclusions.

- **Parental involvement enhances academic performance**  
Academic achievement increases when parents are involved in their children's education. The more intensively involved the parents are, the greater the positive impact on academic achievement.
- **Parental involvement leads to better classroom behaviour.**  
Parental involvement not only enhances academic performance, but it also has a positive influence on student attitude and behaviour. A parent's interest and encouragement in a child's education can affect the child's attitude toward school, classroom conduct, self-esteem, absenteeism, and motivation.
- **parents should stay involved in their children's education from preschool through high school.**  
Parental involvement can make a positive difference at all age levels. Parental involvement tends to be the greatest with young children and tends to taper off as children get older. Studies have shown, however, that involvement of parents of middle and high school students is equally important. In high school, for example, a parent's encouragement can influence whether a child stays in school or drops out. Similarly, a child may consider going to college more seriously when parents show interest in the child's academic achievements and talk with the child about the benefits of a college education.
- **Training helps parents of disadvantaged children get involved.**  
Parents of minority or low-income children are less likely to be involved in their children's education than parents of non-disadvantaged children. If they receive adequate training and encouragement, however, parents of minority or low-income children can be just as effective as other parents in contributing to their children's academic success.
- **Reading together at home greatly improves reading skills.**  
Reading in particular improves greatly when parents and children read together at home. Reading aloud with a child contributes significantly to the child's reading abilities.
- **Schools can encourage parental involvement in many ways.**  
Significant parental involvement is most likely to develop when schools actively seek out ways to get parents involved and offer

training programs to teach parents how to get involved in their children's education.

- **Parental involvement lifts teacher morale.**  
Schools and teachers benefit from parental involvement because involved parents develop greater appreciation for the challenges that teachers face in the classroom. Teacher morale is improved. Communication between home and school helps a teacher to know a student better, which in turn allows the teacher to teach the student more effectively. Communication also helps to dispel any mistrust or misperceptions that may exist between teachers and parents.
- **Parental involvement benefits children and parents.**  
By becoming involved in their children's education, moms and dads get the satisfaction of making a contribution to their children's education and future. They have a better understanding of the school curriculum and activities and can be more comfortable with the quality of education their child is receiving. They spend more time with their children and become able to communicate better with them. Some studies show that a parent's participation in a child's education may inspire the parent to further his or her own education.
- **Time constraints are the greatest barrier to parental involvement.**  
Lack of time is the top reason parents give for not participating more in their children's education. Lack of time is also cited by school personnel as a reason for not seeking parental support more actively. Thus, effective solutions to enhanced parent involvement require freeing up time of parents and teachers or finding ways to work around their schedules.
- **Factors Influencing Parent Involvement:**
- **Child characteristics and development:**  
Child characteristics can influence the magnitude and nature of parent involvement. Young children whose parents actively participated in early childhood programs not only display a head start in academic, social, and emotional learning, but also engage in less risky and delinquent behaviors later in life. As students enter adolescence, often both parents and school personnel misinterpret the adolescents' desire for autonomy as a developmental barrier to family involvement.

- **Beliefs and expectations:**  
Parent and teacher beliefs and expectations are crucial to shaping home-school relations. Beliefs about individuals and group characteristics drive our choices and behaviors, and are crucial in shaping relationships and partnerships. A positive, welcoming school climate, and consistent invitations to parents with ways to become involved in their children's education at home and school, positively predisposes parents about the school's efforts. Parents' positive perception highly influences their children's perception of school, which, in turn, positively contributes to students' academic, social, and emotional learning.
- **Older students**  
It can also play an important role in school-family partnerships. For example, involving older students in parent-teacher conferences and intervention planning creates continuity between home and school, and students get the strong and very important message of valuing education. Receiving a unified message and clear expectations from both parents and teachers is a strong motivation for students to succeed.
- **Lack of Knowledge**  
An important ingredient to parent involvement is communication between parents and teachers. Parents feel that schools must inform them about their curricula as well as about ways to assist their children at home. Many parents believe that parent involvement in their children's school would increase if they had more information and understood better what their children were learning.
- **The school environment.**  
Based on recent census data, ethnic and cultural diversity is increasing in the United States, and the need for schools to prepare minority students for full participation in the American life and society has become even more pronounced. Children may experience adverse conditions in a variety of settings such as poverty and lack of resources in the family, school, or the community.
- **Partnership as a priority:**  
Schools with mission statements that highlight the importance of home-school relationships clearly communicate their commitment to including parents as collaborators in the education of children. But effective implementation of the mission

statement requires the necessary resources, as well as training to support the school personnel

## Conclusion

It was predicted that parent involvement would no longer be a significant predictor of a child's academic performance when the child's cognitive competence and the student-teacher relationship were accounted for in the analyses. School-family partnerships take time and effort to establish and maintained. There are concrete steps that schools can take in order to reach out to parents in a positive and ongoing way. But that is not enough. Since school-family partnerships are a two-way street, parents must build on the school's efforts, or initiate their own, and collaborate with teachers in a productive way for the success of all children. Parent and teacher expectations regarding the academic, social, and emotional development of children have been shown to be among the best predictors of school success.

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## LAND OF MU

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*Mu is a lost continent introduced by Augustus Le Plongeon (1825–1908), who identified the "Land of Mu" with Atlantis. The name was subsequently identified with the hypothetical land of Lemuria by James Churchward (1851–1936), who asserted that it was located in the Pacific Ocean before its destruction. The place of Mu in both pseudoscience and fantasy fiction is discussed in detail in Lost Continents (1954, 1970) by L. Sprague de Camp. Geologists state that the existence of Mu and the lost continent of Atlantis has no factual basis, and is physically impossible, as a continent can neither sink nor be destroyed in the short period of time asserted in the legends, folklore and literature about these places.*

## **History of the concept Augustus Le Plongeon**

The mythical idea of the "Land of Mu" first appeared in the works of the British-American antiquarian Augustus Le Plongeon (1825–1908), after his investigations of the Maya ruins in Yucatán. He claimed that he had translated the first copies of the *Popol Vuh*, the sacred book of the K'iche' from the ancient Mayan using Spanish. He claimed the civilization of Yucatán was older than those of Greece and Egypt, and told the story of an even older continent.

Le Plongeon got the name "Mu" from Charles Étienne Brasseur de Bourbourg, who, in 1864, mistranslated what was then called the Troano Codex (now called "Madrid Codex") using the de Landa alphabet. Brasseur believed that a word which he read as Mu referred to a land that had been submerged by a catastrophe. Le Plongeon identified this lost land with Atlantis and, following Ignatius Donnelly in *Atlantis: The Antediluvian World* (1882), identified it as a continent that had once existed in the Atlantic Ocean.

In our journey westward across the Atlantic we shall pass in sight of that spot where once existed the pride and life of the ocean, the Land of Mu, which, at the epoch that we have been considering, had not yet been visited by the wrath of Human, that lord of volcanic fires to whose fury it afterward fell a victim. The description of that land given to Solon by Sonchis, priest at Sais; its destruction by earthquakes, and submergence, recorded by Plato in his *Timaeus*, have been told and retold so many times that it is useless to encumber these pages with a repetition of it: ch. VI, p. 66.

Le Plongeon claimed that the civilization of ancient Egypt, which is found in Alkebulan/Africa, was founded by Queen Moo, a refugee from the land's demise. Other refugees supposedly fled to North America, Central America, and South America and became the Maya.

## **James Churchward**

Mu, as an alternative name for a lost Pacific Ocean continent previously identified as the hypothetical

Lemuria (the supposed place of origin for lemurs), was later popularised by James Churchward (1851–1936) in a series of books, beginning with *Lost Continent of Mu, the Motherland of Man* (1926), re-edited later as *The Lost Continent Mu* (1931). Other popular books in the series are *The Children of Mu* (1931) and *The Sacred Symbols of Mu* (1933).

Churchward claimed that "more than fifty years ago", while he was a soldier in India, he befriended a high-ranking temple priest who showed him a set of ancient "sunburnt" clay tablets, supposedly in a long-lost "Naga-Maya language" which

only two other people in India could read. Churchward convinced the priest to teach him the dead language and decipher the tablets by promising to restore and store the tablets, for Churchward was an expert in preserving ancient artifacts. The tablets were written in either Burma or in the lost continent of Mu itself, according to the high priest. Having mastered the language himself, Churchward found out that they originated from "the place where [man] first appeared—Mu". The 1931 edition states that "all matter of science in this work are based on translations of two sets of ancient tablets": the clay tablets he read in India, and a collection of 2,500 stone tablets that had been uncovered by William Niven in Mexico.

The tablets begin with the creation of Earth, Mu, and the superior human civilization Naacal by the seven commands of the seven superlative intellects of the seven-headed serpent Narayana. This creation story dismisses the theory of evolution. Churchward gave a vivid description of Mu as the home of an advanced civilization, the Naacal, which flourished between 50,000 and 12,000 years ago, was dominated by a "Melanated/Black race", and was "superior in many respects to our own". At the time of its demise, about 12,000 years ago, Mu had 64 million inhabitants and seven major cities, and colonies on the other continents. The 64 million inhabitants were separated as ten tribes that followed one government and one religion.

Churchward claimed that the landmass of Mu was located in the Pacific Ocean, and stretched east-west from the Marianas to Easter Island, and north-south from Hawaii to Mangaia. According to Churchward the continent was supposedly 5,000 miles from east to west and over 3,000 miles from north to south, which is larger than South America. The continent was believed to be flat with massive plains, vast rivers, rolling hills, large bays, and estuaries. He claimed that according to the creation myth he read in the Indian tablets, Mu had been lifted above sea level by the expansion of underground volcanic gases. Eventually Mu "was completely obliterated in almost a single night" after a series of earthquakes and volcanic eruptions, "the broken land fell into that great abyss of fire" and was covered by "fifty millions of square miles of water." Churchward claimed the reasoning for the continent's destruction in one night was because the main mineral on the island was granite and was honeycombed to create huge shallow chambers and cavities filled with highly explosive gases. Once the chambers were empty after the explosion, they collapsed on themselves, causing the island to crumble and sink.

Churchward claimed that Mu was the common origin of the great civilizations of Egypt, Greece, Central America, India, Burma and others, including Easter Island, and was in particular the source of ancient megalithic architecture. As evidence for his claims, he pointed to symbols from throughout the world, in which he saw common themes of birds, the relation of the Earth and the sky, and especially the Sun. Churchward claimed that the king of Mu was named Ra and he related this to the Egyptian god of the sun, Ra, and the Rapa Nui word for Sun, ra'a. He claimed to have found symbols of the Sun in "Egypt, Babylonia, Peru and all ancient lands and countries – it was a universal symbol."

As additional evidence for his claims, Churchward looked to the Holy Bible and found through his own translations that Moses was trained by the Naacal brotherhood in Egypt. Assyria mistranslated when writing and misplaced the Garden of Eden, which according to

Churchward would have been located in the Pacific Ocean.

Churchward makes references to the Ramayana epic, a religious text of Hindu attributed to sage and historian Valmiki. Valmiki mentions the Naacals as "coming to Burma from the land of their birth in the East," that is, in the direction of the Pacific Ocean.

Churchward attributed all megalithic art in Polynesia to the people of Mu. He claimed that symbols of the sun are found "depicted on stones of Polynesian ruins", such as the stone hats (pukao) on top of the giant moai statues of Easter Island. Citing W. J. Johnson, Churchward describes the cylindrical hats as "spheres" that "seem to show red in the distance", and asserts that they "represent the Sun as Ra." He also incorrectly claimed that some of them are made of "red sandstone", which does not exist on the island. The platforms on which the statues rest (ahu) are described by Churchward as being "platform-like accumulations of cut and dressed stone", which were supposedly left in their current positions "awaiting shipment to some other part of the continent for the building of temples and palaces". He also cites the pillars "erected by the Māori of New Zealand" as an example of this lost civilization's handiwork. In Churchward's view, the present-day Polynesians are not descendants of the dominant members of the lost civilization of Mu, responsible for these great works, but are instead descendants of survivors of the cataclysm that adopted "the first cannibalism and savagery" in the world. **John Newbrough**

In the 1882 book *Oahspe: A New Bible*, John Newbrough included a map of the Earth in antediluvian times (i.e. prior to the great flood of biblical record) where an unknown continent is located in the Northern Pacific. Newbrough called this continent Pan. People often link both Pan and Mu as the same mythological continent since both are claimed to be located in the Pacific. Newbrough continues to claim that the unknown continent disappeared 24,000 years ago, but will soon rise from the Pacific and will be inhabited by the Kosmon race. **Louis Jacolliot**

Louis Jacolliot was a French attorney, judge, and occultist who specialized in the translation of Sanskrit. He wrote about the land of the Rutas, a lost land that ancient sources claimed was in the Indian Ocean but which he placed in the Pacific Ocean and associated with Atlantis stories in *Histoire des Vierges. Les Peuples et les continents disparus* (1874). He amplified upon this in *Occult Science in India* (1875, English translation 1884). He has been identified as a contributor to Rosicrucianism.

### **Modern claims**

James Bramwell and William Scott- Elliot claimed that the cataclysmic events on Mu began 800 thousand years ago and went on until the last catastrophe, which occurred in precisely 9564 BC.

In the 1930s, Atatürk, founder of the Turkish Republic, was interested in Churchward's work and considered Mu as a possible location of the original homeland of the Turks. On the other hand, according to some views, Atatürk's interest in the continent of Mu did not go beyond examining the claims. Despite Tahsin Mayatepek's proposals, he did not see the need to establish a Department of Mu Language at Ankara University's School of Language and History – Geography. The relationship between Atatürk and the continent of Mu has been exaggerated to attract interest in the books written about the continent of Mu.

Masaaki Kimura has suggested that certain underwater features located off the coast of Yonaguni Island, Japan (popularly known as the Yonaguni Monument), are ruins of Mu.

### **Criticism**

Modern geological knowledge rules out "lost continents" of any significant size. According to the theory of plate tectonics, which has been extensively confirmed since the 1970s, the Earth's crust consists of lighter "sial" rocks (continental crust rich in aluminium silicates) that float on heavier "sima" rocks (oceanic crust richer in magnesium silicates). The sial is generally absent in

the ocean floor where the crust is a few kilometers thick, while the continents are huge solid blocks tens of kilometers thick. Since continents float on the sima much like icebergs float on water, a continent cannot simply "sink" under the ocean.

It is true that continental drift and seafloor spreading can change the shape and position of continents and occasionally break a continent into two or more pieces (as happened to Pangaea). However, these are very slow processes that occur in geological time scales (hundreds of millions of years). Over the scale of history (tens of thousands of years), the sima under the continental crust can be considered solid, and the continents are basically anchored on it. It is almost certain that the continents and ocean floors have retained their present position and shape for the whole span of human existence.

There is also no conceivable event that could have "destroyed" a continent, since its huge mass of sial rocks would have to end up somewhere—and there is no trace of it at the bottom of the oceans. The Pacific Ocean islands are not part of a submerged landmass but rather the tips of isolated volcanoes.

This is the case, in particular, of Easter Island, which is a recent volcanic peak surrounded by deep ocean (3,000 m deep at 30 km off the island). After visiting the island in the 1930s, Alfred Métraux observed that the moai platforms are concentrated along the current coast of the island, which implies that the island's shape has changed little since they were built. Moreover, the "Triumphal Road" that Pierre Loti had reported ran from the island to the submerged lands below, is actually a natural lava flow. Furthermore, while Churchward was correct in his claim that the island has no sandstone or sedimentary rocks, the point is irrelevant because the pukao are all made of native volcanic scoria.

### **Archaeological evidence**

Easter Island was first settled around 300 CE and the pukao on the moai are regarded as having ceremonial

or traditional headdresses.

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