Analysis of Effective Mathematical Teaching Through Multimedia by Experimental and Theoretical Model

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First words . . .

- Thanks to the INTCONED 2010 PC and the organizers for the invitation.

My Role Model . . .

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Summary of Education and Technology

- India can become one of the developed countries in the world by 2020, if we adopt technology as our tool- Kalam.
- According to NCERT defines educational technology as the means of development,application and evaluation of three different things Technique, Systems and Aids and improve the process of human learning.
- According to UNESCO, educational technology is a communication process resulting form application of scientific method to the behavioral science of teaching and learning.
- mathematics student is interested to know the effectiveness of multimedia in improving the delivery of inputs to our young generation.

Global approach of educational technology . . .

- Identification of objectives.
- Design learning experiences.
- Evaluate effectiveness of those learning experience in achieving the objectives.
- Improve the learning experience in the light so as to achieve the objectives better.

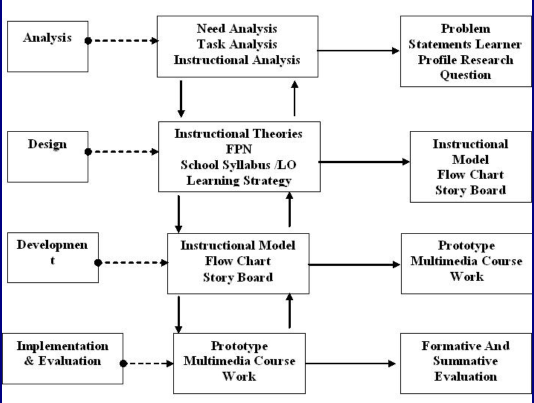
Research Layout . . .

- Theoretical Model like Belief Revision.
- Experimental Model like Control group and Experimental group.

Importance of Multimedia and Mathematics Instruction

- Mathematics is a difficult subject, Multimedia technologies have a wide impact in the mathematics classroom.
- Multimedia enables students to visually examine concrete representation of mathematics concept.
- For example in using the graphing calculator, the analysis of the calculator images.
- The National Council of Teachers of Mathematics (NCTM) has argued even more persuasively in support of the use of computing technologies in the classroom.

Framework of Multimedia



Objectives of the study

- To study the effectiveness of teaching set theory in mathematics through multimedia over the traditional method.
- To study the effectiveness of teaching set theory in mathematics through multimedia over the traditional method in pre-test scores and post-test.
- To study the effectiveness of multimedia teaching on the achievement of high achievers and low achievers in high school students.
- To find out influence of multimedia package on the achievement in mathematics among high school students.
- To find out the significant difference in achievement in mathematics between high achievers and low achievers from both the experimental and control groups.

Scope of the study

- It will increase teaching learning process at the school on the selected topic content.
- It will increase the retention capacity of the students in terns of long-term memory in learning.
- It helps both the teacher and students to be in the realm of technology in terms of behavioral pattern.

The steps involved in the research

- Topic selection in the IX standard mathematical subject.
- The preparation of instructional Aids used to introduces and impact the subject to the students.
- Construction of the pretest
- Conduction the study with control group through chalk and action method.
- Conduction the study with experimental group through preparation of instructional aid.
- Construction of the post test

Layout of study

Sl.No	Experimental Group	Control Group
1	Pre-Test	Pre-Test
2	Multimedia	Chalk and action Method
3	Post-Test	Post-Test
4	Comparison	

Outline of problem

- Our belief and knowledge can change over time
- When are we sure that we carry out change rationally?
- How this can be implemented for a specific application?

Belief Set

- Abstract philosophical level.
- Rationality of changes.
- A Belief set as deductively closed set of sentences.
- Belief are represented as logical closed set Cn.
- AGM approach.

Con . . .

Example:

- All Birds fly.
- Penguins are birds.
- Penguins do not fly.

Con ...

For any set of sentence K and α and β over L, Cn satisfies:

- (*inclusion*) $K \subseteq Cn$
- (*monotony*) if $K \subseteq k'$, then $Cn(K) \subseteq Cn(K')$
- (*iteration*) $Cn(K) = Cn(Cn(K))$
- (*superclassicality*) if a sentence α follows by classical truth-functional logic from K, then $\alpha \in Cn(K)$
- (*deduction*) if $\beta \in Cn(K \cup \{\alpha\})$, then $(\alpha \rightarrow \beta) \in Cn(K)$
- (*compactness*) if $\alpha \in Cn(K)$, then $\alpha \in Cn(K')$ for some finite set $K' \subseteq K$

Three Kinds of Belief Changes

- Expansion: Let K be a belief set, and α a belief that is consistent with K. Then *expansion* of K by α, denoted $K + \alpha$
- Revision: Let K be a belief set, and α a belief that is inconsistent with K. Then *revision* of K by α, denoted $K \pm \alpha$ is a consistent belief set that include α
- Contraction: Let K be a belief set, and α a belief that is present in K. Then *contraction* of K by α, denoted $K \dot{-} \alpha$ is a consistent belief set that excludes α.

Rational Postulates for Revision

- (Closure) $K \pm \alpha$ is a belief set.
- (Success) $\alpha \in K \pm \alpha$
- (Expansion 1) $K \pm \alpha \subseteq K + \alpha$
- (Expansion 2) if $\neg\alpha \notin K$, then $K + \alpha \subseteq K \pm \alpha$
- (consistency) $K \pm \alpha = K_{\perp}$ *iff* $\vdash \neg\alpha$
- (Extensionality) if $\vdash \alpha \leftrightarrow \beta$, then $K \pm \alpha = K \pm \beta$
- (Conjunction 1) $K \pm (\alpha \wedge \beta) \subseteq (K \pm \alpha) \pm \beta$
- (Conjunction 2) if $\neg\beta \notin K$, then $(K \pm \alpha) \pm \beta \subseteq K \pm (\alpha \wedge \beta)$

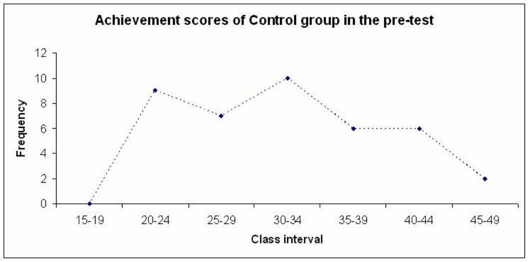
Rational Postulates for Contraction

- (Closure) $K \dot{-} \alpha$ is a belief set.
- (Inclusion) $k \dot{-} \alpha \subseteq K$
- (Vacuity) if $\alpha \notin K$, then $K \dot{-} \alpha \equiv K$
- (Success) if $\nvdash \alpha$, then $\alpha \notin K \dot{-} \alpha$
- (Preservation) if $\vdash \alpha \notin \beta$,then $K \dot{-} \alpha \equiv k \dot{-} \beta$
- (Recovery) $K \subseteq (K \dot{-} \alpha) + \alpha$
- (Conjunction1) $K \dot{-} \alpha \cap K \dot{-} \beta \subseteq K \dot{-} (\alpha \wedge \beta)$
- (Conjunction2) if $\alpha \notin K \dot{-} (\alpha \wedge \beta)$,then $K \dot{-} (\alpha \wedge \beta) \subseteq K \dot{-} \alpha$

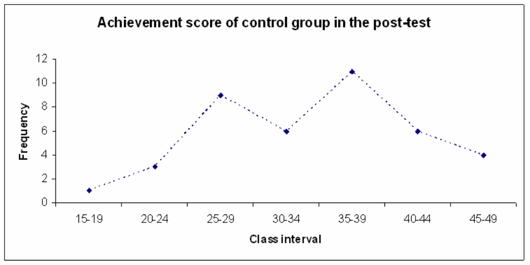
Related to each other

- (*Levi Identity*) $K \pm \alpha = (K \dot{-} \neg\alpha) + \alpha$
- (*Harper identity*) $K \dot{-} \alpha = K \cap (K \pm \neg\alpha)$

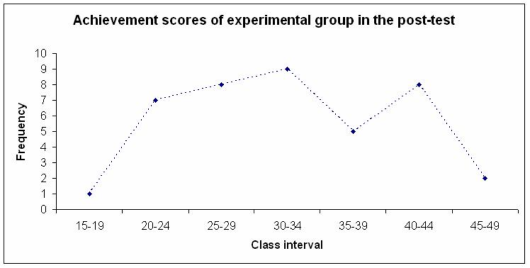
Control group Pre-Test



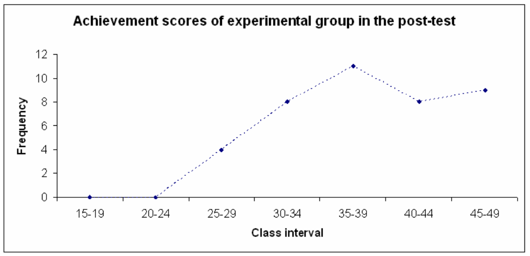
Control group Post-Test



Experimental group Pre-Test



Experimental group Post-Test



Question

Thank-you. Are there any questions?