# Computer Based Mastery Learning Instruction in Schools

Mastery Learning

- **Mastery Learning** is a method of instruction based on the belief that **anyone can learn anything given enough time** and the **right quality of instruction**
- **Conditions for Mastery learning are:**
  - Learning objectives are clearly defined and articulated
  - Assessments are aligned to the learning objectives and accurately measure the students' progress
  - Students have attained mastery in the prior learning units before moving on to the next
- Several studies on Mastery Learning Instruction shows about 84% percent of the learners in the class can achieve 80% or more by spending 4% of time on feedback and corrective procedures
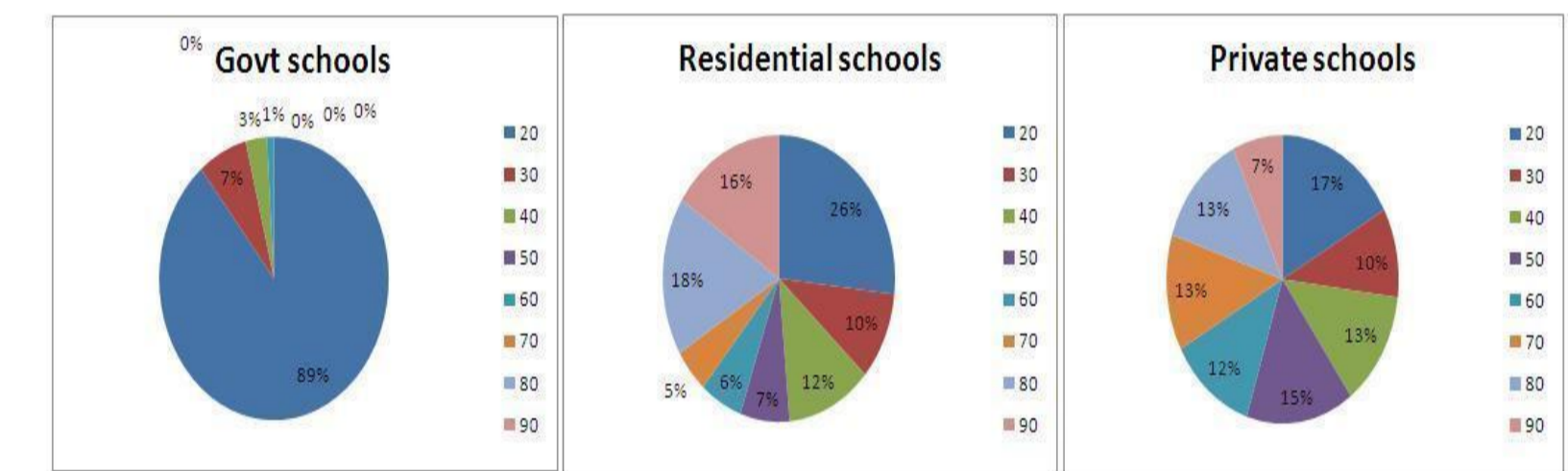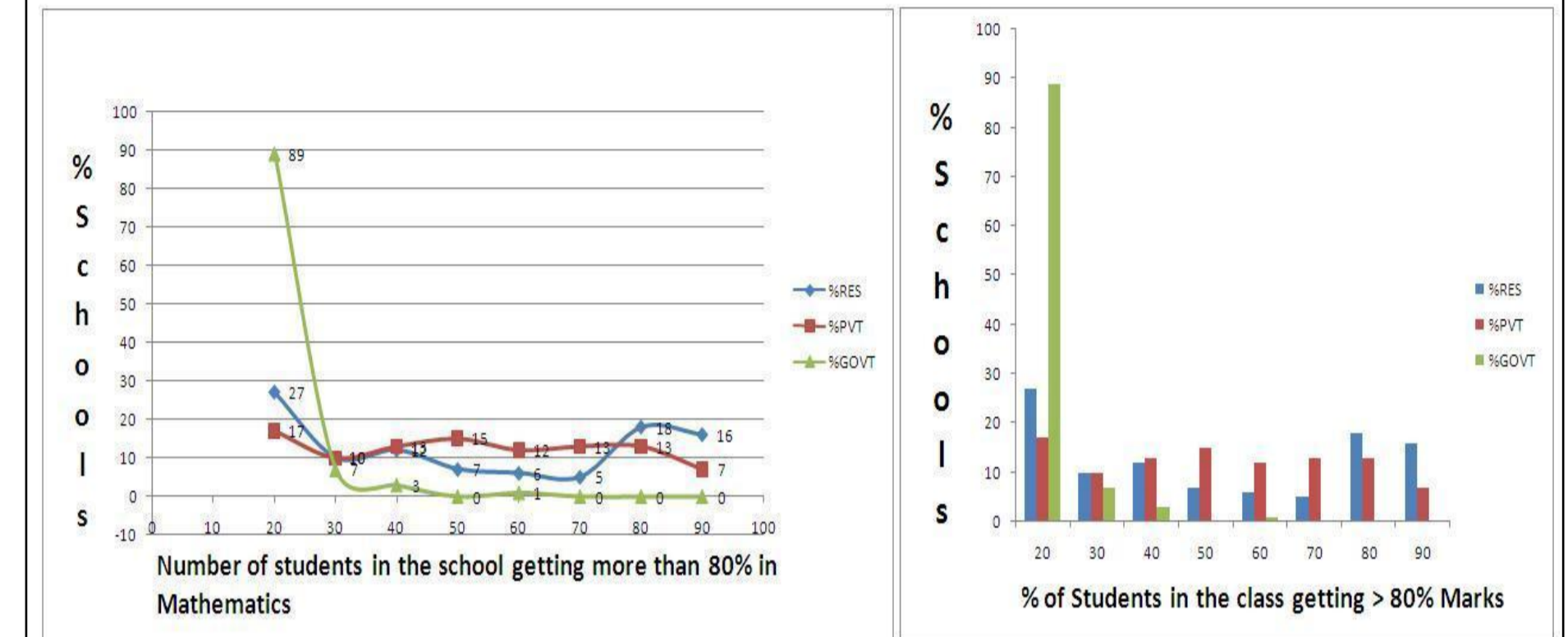
2 Sigma Problem

FIGURE 1. Achievement distribution for students under conventional, mastery learning, and tutorial instruction.

TUTORIAL 1-1*

MASTERY LEARNING 1-30*

CONVENTIONAL 1-30*

Summative Achievement Scores
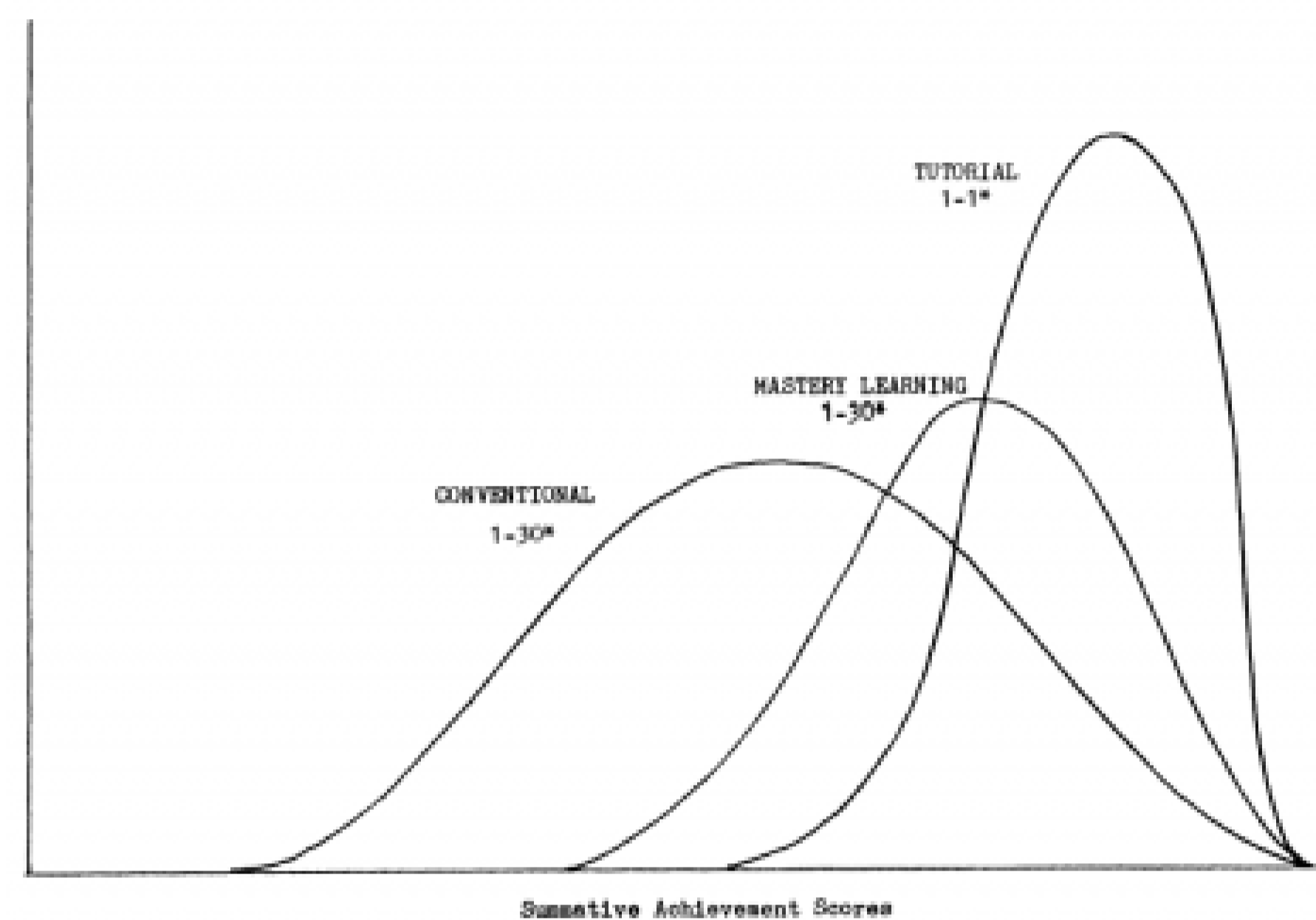
*Teacher-student ratio

Andhra Pradesh Schools Academic Performance

Performance of students studying in Andhra Pradesh in 10 grade Mathematics

Factors Effecting the Academic Performance in Schools

- Teachers handle more students in the class
  - Not all the students get the required teacher attention
- Cannot afford to provide good tutors for slow learners
- Teaching methodologies are obsolete
- Curriculum does not teach study skills
- Rote-learning rather than deep understanding
- Lack of infrastructure
- No clear measure of the learning at the end of the class to determine the students who don't have the prerequisites to go to the next class
- Students without having prerequisite knowledge are forced to attend next class
- From the last 4 years of SSC data
  - Only about 20% of the students are getting good grades in the current condition
  - How do we help the remaining 80%?

Proposed Pedagogy

Increasingly, educators, researchers, and policy makers believe that teachers supported by effective management are the key to education quality and change.

- Imagine the AP residential school using mastery learning
- The challenge would be to ensure that all the students have the necessary prerequisites for the next class they have to attend in mathematics
- Obviously the students who don't have these prerequisites will have to learn the prerequisites with the support of some teacher/tutor.
- In this context, we propose to set up
  - ✓ paper based multiple choice question test at the end of each class to determine the students who don't have the prerequisites at the end of each class.
  - ✓ set up a computer based remedial instruction for these students such that they get tutorial type instruction on the items they may not have learned in the class.

Experiment and Expected Results

- We plan to experiment implementing mastery learning principle by using computer based approach on 200 students of Seventh grade in 5 Government residential schools to observe how each student reach a level of proficiency and support effectiveness of mastery learning.
  - Computers sponsored by INTEL
- Improving student's confidence
- Improving student's performance in final exam
- Improving student's performance in national competitions like Math Olympiad
- Improving students retention to higher studies
- Using our instructional model we anticipate that up to 84% of the students will achieve 80% or more.
- Developing a framework of mastery learning for other schools with minimal intervention

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