

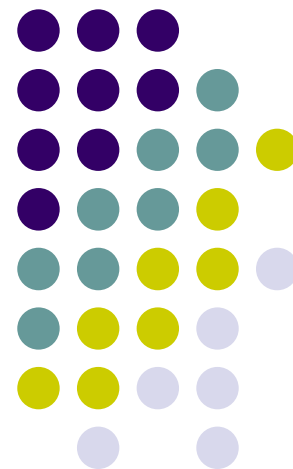
# **Integration of Laboratory Activities, Demonstrations, and Projects in Enriched Mathematics 9-12 Courses to Foster Science and Mathematics Literacy Evaluation Techniques**

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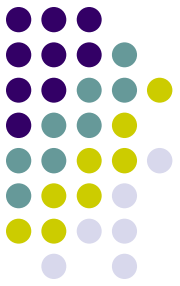
Tim Pelton, UVic

Karen Moore, UVic

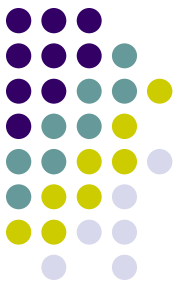
Michael Willers, SD #69



# Context

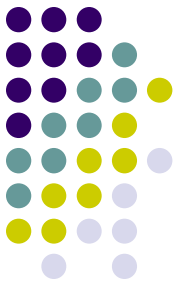


- Project involves enriched courses created by combining two or more courses to extend over a school year.
- The overlap or continuation of PLO's in combined courses creates opportunities for instructional time to be allocated to alternate assignments and teaching strategies.



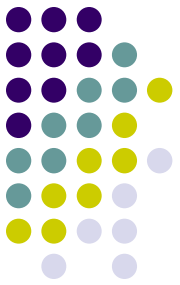
# Setting and Subjects

- Courses created to date include Enriched Math 9/10 (combines Math 9 & Applications of Math 10) and Enriched Math 10/11 (combines Principles of Math 10, Applications of Math 11 & Principles of Math 11)
- Students self-select to register for the Enriched Math courses  $\Rightarrow$  not a random sample



# Evaluation Techniques

- attitude scales
- in class observations
- student products from the enriched activities,
- scores on achievement tests
- questionnaires
- student interviews.



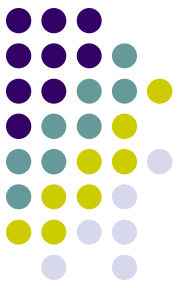
# Attitude scales

- Fennema-Sherman Mathematics Attitudes Scales
- Likert scale with 9 sub-scales
- Used 5 of the scales (usefulness, anxiety, confidence, attitude towards success, motivation)
- Pre-post control/comparison design used
- T-tests used to compare the two groups



# Class observations

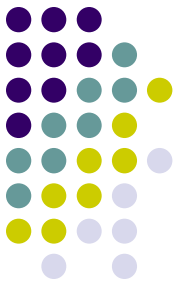
- Class visits during enrichment activities only
- Participant observer status i.e. interacted with students and helped with activities as needed
- Some activities videotaped
- Team meetings after class visits to discuss our observations
- Analysis included search for patterns as well as significant events



# Student products

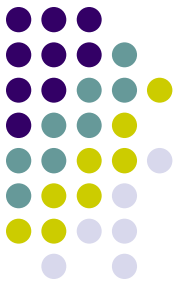
- All enrichment activities resulted in some type of student product e.g. completed worksheet, PowerPoint presentation, etc.
- Student work evaluated to assess level of student understanding of the concepts involved in the particular activity

# Achievement Tests

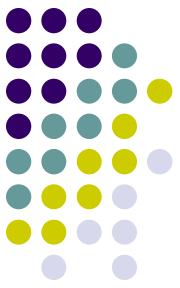


- Initial pilot: Used Grade 9 final exam scores as a measure of prior achievement
- Compared scores on year end final exam and provincial exams of students in the enriched mathematics course and those in the regular mathematics course
- Subsequent years: Provincial exam scores compared to provincial averages

# Questionnaires



- 6 open-ended questions
- Asked about reasons for taking course, experiences in the course, and future plans
- Looked for themes in responses to uncover attitudes towards mathematics and impact of course



# Student Interviews

- Interviews conducted one month after student surveys administered.
- Stratified random sample (2 high, 2 middle, 2 low achieving students)
- Questions similar to those on the survey
- Used to expand on themes from the survey, check for stability of responses, and to look for any correlations with achievement levels