

# Teaching and Learning in Collaborative Virtual High Schools



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# Agenda

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- Review of Proposed Efforts
- Description of Data Collection
- Explanation of Findings
- Discussion
- Questions



**9-12 Online High School**

**Chartered April 22, 2002**

**Appleton Area School District**

# *Kiel eSchool*



**7-12 Online Charter School**

**Chartered June 10, 2002**

**Kiel Area School District**

**Kiel, Wisconsin**



# Research Design

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- Recent has provided evidence of the effectiveness of virtual high schools (Cavanaugh, Gillan, Kromrey, Hess, and Blomeyer, 2004; Emeagwali, 2004), with some even arguing that the virtual school can be a framework to answer the needs of education and learning (Brown, 1998).
- It is crucial to build upon early studies to inform new policy and practice in this area.



# Research Design

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- Cavanaugh et al. (2004) argue: “The importance of knowledge about effective virtual schooling cannot be overstated, because of the current boom in the numbers of virtual schools and students, and because of the essential role virtual schools can play in school reform movements and workforce development efforts” (p. 22).
- We proposed to complete a multi-faceted research agenda that would significantly add to the body of research on virtual schooling, particularly in the area of *student outcomes*.



# Research Objective #1

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- *"When designed correctly, are virtual high school classes as effective as their face-to-face counterparts in terms of student achievement?"*
  - Method A – End of term assessments created by content area experts
  - Method B – "Personal Financial Management"; assessment of one course



## Research Objective #2

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- *"Is it possible to predict student success or failure in online virtual high school courses?"*
- Roblyer and Marshall's (2003) *Educational Success Prediction Instrument* (ESPRI).



## Research Objective #3

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- *How do students compare in describing their experiences in online vs. face-to-face classrooms and are these experiences significantly related to achievement outcomes, both within and between groups?*
  - *What Is Happening In this Classroom (WIHIC) Survey*



# Other Objectives

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- "Does content area make a difference in the effectiveness of online vs. face-to-face high school courses?"
  - Method A – Keep content in mind with #s 1-3
  - Method B – Content area surveys to address content appreciation
- Long-term outcomes



# Data Collection

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- ESPRI

- Worked with Roblyer; Initially put a 53 item and then a 70 item ESPRI online
- All online students were asked to take the ESPRI
- Some students took more than one class over the data collection period; In those cases we used the first entry



# Data Collection

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- WIHIC
  - Worked with the University of Minnesota
  - Put two versions online
    - Face-to-face version given only to 5 classes we were using to compare f2f and online (Algebra 1, Algebra 2, Geometry, Health, and Personal Financial Management)
    - Online version included an end-of-course survey



# Data Collection

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- Other Data
  - Parent survey
  - Additional course material where we could compare f2f and online
    - Algebra 1 (Final grade, final exam)
    - Algebra 2 (Final course grade)
    - Geometry (Final grade, Final Exam)
    - Health (Final grade, Final exam)
    - Personal Financial Management (Final grade, final exam, 3 additional assignments)



# Findings

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- Research Objective #1: When designed correctly, how effective are virtual high school classes in comparison to their face-to-face counterparts in terms of student achievement?



# Findings

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- Research Objective #1:
  - Overall face-to-face vs. online final grades = *No Significant Difference in achievement* (expected)
  - Looking at Final grade by subject, :
    - Algebra 1, **Geometry**, and **PFM** → did better online
    - Algebra 2, Health → did better face-to-face



# Findings

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- Research Objective #1:
  - Final exam differences by subject (given to all courses but Algebra 2)
    - Online classes did better in all subjects
    - Only significant differences were between online and face-to-face students in Algebra 1 and Personal Financial Management
    - Algebra 1 and PFM were the only two courses with the same instructor in both formats
    - 2 of the 3 assignments for PFM were significantly different, all three favored online



# Findings

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- Research Objective #2: Is it possible to predict student success or failure for students taking online virtual high school courses?



# Findings

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- Research Objective #2:
  - 202 ESPRI surveys were submitted from 18 different online classes
  - Only 173 were used
    - Duplicates
    - System-testing
    - Students hitting submit twice
    - 9 students who weren't in system (took for fun?)
  - Reliability at .87



# Findings

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- Research Objective #2:
  - ESPRI was able to predict:
    - student GPAs
    - student grades
    - predict pass/fail
      - (Roblyer had 100% prediction for pass and 95% for fail)
      - Our study had 100% overall predictability (100% of fail students and 100% of pass students were correctly classified)



# Findings

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- Research Objective #2:
  - We analyzed the ESPRI scores looking specifically at the 6 subjects with more than 15 students in the class to determine if subject was an indicator of pass/fail grouping
  - Personal Financial Management and Creative Writing could successfully predict pass/fail groupings; Algebra 2, English, Geometry and History could not



# Findings

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- Research Objective #3: How do students compare in describing their experiences in online vs. face-to-face classrooms and are these experiences significantly related to achievement outcomes?



# Findings

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- Research Objective #3:
  - We had a poor response rate to the WIHIC by online students. Only 18 online students but 248 face-to-face students
  - For this reason, had to run logistic regressions
  - Internal reliability of .96



# Findings

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- Research Objective #3:
  - Of the 7 WIHIC Scales - 2 Were significantly higher for face-to-face students than online students
    - Student Cohesiveness
    - Cooperation
    - Teacher Involvement
    - Investigation
    - Task Orientation
    - Equity
    - Teacher Support
  - Student Cohesiveness and Cooperation were highly correlated at .765



# Findings

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- Research Objective #3:
  - Task Orientation subscale was significant in predicting student grades. Students with higher scores on task orientation were more likely to have higher grades
  - Final WIHIC analyses by subject area were completed
    - Difficult to say anything with certainty due to low numbers in individual classes and low numbers between online and face-to-face groups.



# Discussion

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- Research Objective 1
  - No significant difference when comparing all online vs. face-to-face, but there is evidence that different courses produce different results. We need to understand why.
  - It is important to be specific about what knowledge is gained, as a final exam score is different than a final course grade (which includes attendance, etc.)



# Discussion

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- Research Objective 1
  - If differences are found, we need to know why (i.e. Swan, 2003).
  - “Why?” could come in the form of qualitative analyses, or it could potentially come in the form of the WIHIC or the *Technology Rich Outcomes Focused Learning Environment Survey* (TROFLEI; Aldridge, Dorman & Fraser, in press)
  - Future research needs to continue to examine course differences and ask why



# Discussion

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- Research Objective 2
  - The ESPRI 'worked' replicating the predictive validity of the instrument as first claimed by Roblyer and Marshall (2003)
  - Our work demonstrated differences in content area, and we wonder about the implications of this. Are there specific questions that are more predictable for certain subjects? Should there be a subject-based ESPRI?



# Discussion

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- Research Objective 2
  - We did not have the time to use the ESPRI as a counseling tool. Developing this tool as an advisory innovation (not a gatekeeper!) will be important for future work.
  - Future work should also include a large-scale factor analysis of the ESPRI once enough data has been collected.



# Discussion

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- Research Objective 3
  - The WIHIC was useful and could potentially be a quantitative answer to the 'Why are there differences?' question in research objective one.
  - We were not able to compare online vs. face-to-face student answers by subject area as we had so few online responses. Future research should look at the WIHIC by subject area, comparing F2F and online to see if that helps explain what is going on.



# Discussion

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- Research Objective 3

- It makes sense that the Student Cohesiveness scale and the Cooperation scale were significantly higher for face-to-face students. Online students in this data collection period were not part of a cohort that started and stopped at the same time. Results may be different during the summer, which again provides support that the WIHIC may be useful in answering the “what is different about the two classes” question.



# Questions

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Please email us!

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