

TITLE: Learning within Cases: A Comparison of Private and Public Higher Education and Preservice and Practicing Teachers

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Abstract

The purpose of this research is to develop powerful/innovative solutions for teacher training in a complex economic, social, and environmental society from diverse perspectives. The use of interactive multimedia cases in teacher education instruction has been supported by empirical research as a means of assisting learners in a meaningful understanding of classroom complexities and the facilitation of explicit multi-dimensional practice to theory connections. Despite this popularity, there have been no empirical studies to date that relate conditions of use to learning outcomes or extent to which knowledge and skills learned in cases transfers to professional use. The presentation will share research results from an ongoing federally funded investigation using multimedia technologies across private and public universities.

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Summary

A. Objectives or Purposes

The purpose of this research is to develop knowledge and technologies that provide powerful and innovative solutions for teacher training in a complex economic, social, and environmental society from a variety of perspectives. It is anticipated these perspectives will challenge and reform teacher training efforts. They encourage researchers to examine the manner in which we conduct our work as educators in higher education, both private and public. It is our duty as teacher educators to create citizen professionals deeply engaged in service for the public good. This is even more the creed of the private university.

The purpose of this presentation will be to share research results from a federally funded investigation that involves grounded research methodology in teacher training using multi-media technologies across private and public universities. Evidence-based scientific inquiry will be presented and discussed amongst the participants in order to expand the findings for further applications.

B. Perspectives or Theoretical Framework

Shulman (2004) in *Essays on Teaching, Learning, and Learning to Teach* presented the advantages of using cases over expository texts for the training of teachers. Learning goals should emphasize reasoning and collaborations around real problems, and cases used as “building blocks” for discourse and reasoning. Case-based instruction can be a powerful method of facilitating explicit practice to theory connections. The use of multimedia in preservice teacher education has been supported by empirical research as a means of assisting learners in meaningful understandings of classroom complexities. A call for the potential use of hypermedia as a combination of videocases and written cases allows for the actions taken and data collected to be quickly and easily found as well as categorized (Lundeberg, Levin, & Harrington, 1999).

Hypermedia cases such as those created and housed at the VRCBD (Virtual Resource Center in Behavioral Disorders) web site (<http://coe.missouri.edu/~VRCBD>) (Fitzgerald & Semrau, 1998-2000) provide a hypermedia environment for teachers in training to explore and experience a variety of perspectives for complex K-12 student concerns in educational, economic, social, biophysical, and environmental dimensions. Elksnin (2001) asks an important question. Even though case-based instruction demonstrates learner growth, are learners becoming better problem-solvers? According to research on “closing the research to practice gap” (Gerber, English, & Singer, 1999), learning technologies can contextualize the generalization of essential knowledge and skills from higher education settings into authentic classrooms. Despite the popularity of case-based instruction, there have been no empirical studies to date that relate usage conditions of cases or types of cases, with and without technological supports, to learning outcomes. Neither have there been studies of the extent to which knowledge and skills developed in case-based learning transfer to professional use.

C. Methods, Techniques, or Modes of Inquiry

The researchers in this project are studying technology-enhanced case instruction across a variety of courses and delivery modes involving approximately 250 preservice/in-service teacher education students. The research is designed to track what these teachers learn from cases and how they transfer learning outcomes to field work, student teaching, and job settings.

The multi-media cases used for instruction are part of a research consortium (VRCBD-RC) three-year research project funded by the US Department of Education focusing on case-based instruction in higher education (Fitzgerald, Hollingsead, Koury, Miller, & Mitchem, 2004-2006). The instruction incorporates the use of interactive multimedia cases to develop knowledge and skills and transfer these outcomes to real settings. Further technological supports include the integration of online discussions and chats to support collaborative learning with the materials and electronic performance support software tools to support skill transfer. The research project is a collaborative project involving five universities, four are public and one is private. Several strands of investigations are included within the research. One strand of research examines variable comparisons of learner performance between public universities as compared to private university participants. A second strand focuses on the comparison of preservice and practicing teachers' performance. Broad research questions can be seen in Table 1.

A grounded theory approach using qualitative methodology has been selected because it is best suited to generate a research-based model to explain the effectiveness and outcomes of this innovation. Grounded theory uses scientific rigor to interrelate categories of information based on multiple data sources into a theory to guided practice (Creswell, 1998; Glaser & Strauss, 1967). Multiple methods of qualitative inquiry and analysis are being conducted within and across training groups to examine and interrelate the process of learning from practice field cases with learning outcomes and the transfer into practice settings.

D. Data Sources or Evidence

A wide range of quantitative and qualitative data are being collected during this project. Data are collected through review of case artifacts using rubrics, computer data generated by users while using the cases and performance support tools, qualitative analysis comparison of concept maps created at training and transfer milestones, discourse analysis during online discussions, interviews with participants, and instructor field notes, and researcher memos. A mixed-methods model will be used to measure and explain the effectiveness of case-based instruction occurring in multiple training programs where contexts and implementation are allowed to vary naturally.

The Table 1 describes the major and sub-research questions and the forms of data collection during the two phases of research. The first two years focus on determining the effectiveness of case-based learning with technological supports, and the third year (which is currently underway) focuses on transfer of the learning outcomes into real classroom settings.

Table 1: Research Questions and Data Collection

Question	Sub-Questions	Data Collection
1. How are practice field cases implemented effectively in teacher education? What implementation variables influence effectiveness in multiple contexts?		
1A.	How are cases implemented?	<ul style="list-style-type: none"> • Syllabuses and assignments • User audit trail records on disk collected while using cases • User statistics during use of online discussion board or chats • Records of materials usage • Instructor field notes • Researcher memos
1B.	What do students learn from cases?	<ul style="list-style-type: none"> • Qualitative analysis of artifacts within cases using rubrics • Concept map scores for maps created at multiple benchmarks during training • Instructor field notes • Researcher memos
1C.	What do learners perceive as the benefits and limitations of practice field case-based instruction?	<ul style="list-style-type: none"> • Semi-structured interviews • Researcher memos
1D.	What changes are needed in preparing programs to utilize and sustain practice field cases in preservice/ inservice training?	<ul style="list-style-type: none"> • Coding and theme analysis of online discussion with consumer focus group members • Researcher memos
2. How are practice field discussion groups offered effectively during training? What participation variables influence effectiveness in multiple contexts?		
2A.	How does online discussion with other learners affect social construction of knowledge, skills, and problem solving?	<ul style="list-style-type: none"> • Discourse analysis of online discussions and chats through coding and theme identification • Instructor field notes • Researcher memos
2B.	How does online discussion with field-based professionals and parents affect social construction of knowledge, skills, and problem solving?	<ul style="list-style-type: none"> • Discourse analysis of online discussions and chats through coding and theme identification • Instructor field notes • Researcher memos
2C.	What do learners perceive as the benefits and limitations of practice field discussion groups?	<ul style="list-style-type: none"> • Semi-structured interviews • Researcher memos
3. How are knowledge and skills gained in practice field cases utilized in child services during training? What sustained outcomes emerge during guided practice?		

3A.	In what ways are knowledge and skills applied to child services during training?	<ul style="list-style-type: none"> • Qualitative analysis of artifacts contained in instructional and intervention materials • User audit trail records on EPSS tool programs used in services • Concept map scores for maps created at end of applied practice • Observations by field supervisors • Instructor field notes • Researcher memos
3B.	How do learners perceive the applicability of knowledge and skills developed in the practice field cases to child services?	<ul style="list-style-type: none"> • Coding and theme analysis of online discussions and chats during guided practice phase • Semi-structured interviews • Interviewer field notes • Researcher memos
4. How are knowledge and skills gained in practice field cases transferred to child services in employment settings? What sustained outcomes emerge during employment?		
4A.	In what ways are knowledge and skills transferred to child services in employment settings?	<ul style="list-style-type: none"> • Qualitative analysis of artifacts contained in teaching and intervention materials • User audit trail records on EPSS tool programs used in services • Concept map scores for maps created at end of follow-up phase • Researcher memos
4B.	How do practicing teachers perceive the applicability of knowledge and skills developed in the practice field cases to child services?	<ul style="list-style-type: none"> • Coding and theme analysis of online discussions and chats during employment phase • Semi-structured interviews • Interviewer field notes • Researcher memos

E. Results and/or Conclusions/Point of View

For the purpose of this study, to date, six different groups have been investigated. The total individuals consenting to be included in the study was 235. The research pool selected was N=151. Undergraduate participants were drawn from courses taught at two different universities, public and private, and included general and special education preservice teachers. Graduate groups represented three universities, two public and one private, and one online group. These groups also included general and special education teacher candidates. Additionally, the private university used a field method model with graduate special education practicing teachers. This information is depicted in Table 2.

Table 2: Research Sample to Date

	Site	Semester	Course Name
I. UG Mainstreaming GE (N=17)	CUP	Spring	Mainstreaming the Exceptional Learners (N=17)
II. UG Special ED	AN	Fall	Introduction to Special Education (N=6)

(N=30)	CUP	Fall	Behavior Principles (N=24)
III. GR Intro GE (N=23)	CUP	Summer	Introduction to Exceptionality
IV. GR Methods SE (N=65)	UCF	Spring	Methods of Behavioral Management (N=8)
		Fall	Methods of Behavioral Management (N=20)
	AN (ON)	Spring	Behavioral and Emotional Problems of Children (N=5)
		WVU	Spring
	Fall		Classroom Behavior Management (N=10)
V. GR Field Methods SE (N=7)	AN (OFF)	Spring	Seminar: Behavioral and Emotional Problems of Children (N=4)
	AN	Summer	Advanced Studies: Legal & Ethical Issues in Special Education (N=3)
VI. GR Online Methods SE (N=9)	UMC	Summer	BD Online: Interactive Cases in Behavioral Disorders (N=9)

Undergraduate general education students spent an average of 139 minutes per case study per student. Undergraduate special education students spent an average of 275 minutes per case study per student. Graduate general education students spent an average of 134 minutes of engagement time per case per student. Graduate special education students spent an average of 207 minutes of engagement time per case per student. For the field methods graduate students in special education, the average of minutes engaged in case per student was 412 minutes. Lastly, the online graduate course had an average of 286 minutes per case for each student.

Private undergraduate students spent an average of 235 minutes per case study per student. Public undergraduate students spent an average of 224 minutes. Private graduate students spent an average of 367.5 minutes per case study per student. Public undergraduate students spent an average of 237.3 minutes.

Undergraduate general education students had an average completion rate per case study per student of 84%. Undergraduate special education students had an average completion rate per case study per student of 87.6%. Graduate general education students had an average of 75.8% completion rate per case per student. Graduate special education students had an average of 83% completion rate per case per student. For the field methods graduate special education the average completion rate by case per student was 90.15%. The online graduate course had an average of 85.9% completion rate per case for each student.

Undergraduate private education students had an average completion rate per case study per student of 86.2% while public school counterparts had a completion rate of 86.8%. Graduate private education students had an average of 91.83% completion rate per case per student, and public students 80.68%.

In summary, general education students appeared to spend less time engaged in the cases in terms of minutes and completion rates when compared to special education students. Private school students spent more time in the cases and had higher completion rates both at the undergraduate and graduate levels. Even though the engagement figures are significantly higher for the field methods course, the group size for private school students is not large enough at this time to draw any strong generalizations and levels of significance cannot be run. Details of the data presented can be viewed in Table 3.

Table 3: Engagement in Case Activities

	Site	Sem. 2004	Course Name	Case#1 Time Complete	Case#2 Time Complete	Case#3 Time Complete
I. UG Mainstreaming GE (N=17)	CUP	Spring	Mainstreaming the Exceptional Learners (N=17)	Joyce 129 min. 81.7%	Jimmy 149 min. 86.3 %	
II. UG Special ED (N=30)	AN	Fall	Introduction to Special Education (N=6)	Shawn (6) 272 min. 88.7 %	Matthew (3) 235 min. 86.7 %	Zach (3) 252 min. 83.3 %
	CUP	Fall	Behavior Principles (N=24)	Zach 278 min. 89.3 %	Shawn 340 min. 90.0 %	
III. GR Intro GE (N=23)	CUP	Summer	Introduction to Exceptionality	Jimmy 139 min. 74.0 %	Joyce 129 min. 77.6 %	
IV. GR Methods SE (N=65)	UCF	Spring	Methods of Behavioral Management (N=8)	Matthew 164 min. 78.6 %	Amy 331 min. 75.3 %	
		Fall	Methods of Behavioral Management (N=20)	Matthew 256 min. 91.9 %	Amy 396 min. 91.0 %	Deangelo 298 min. 80.4 %
	AN (ON)	Spring	Behavioral and Emotional Problems of Children (N=5)	Zach 318 min. 97.6 %	Shawn 240 min. 92.8 %	
	WVU	Spring	Characteristics and Methods of Behavioral Disorders (N=25)	Matthew 147 min. 88.8 %	Shawn 114 min. 79.0 %	
		Fall	Classroom Behavior Management (N=10)	Amy (10) 299 min. 75.8 %	Martell (5) 123 min. 70.8 %	Deangelo (5) 195 min. 74.6 %
V. GR Field Methods SE (N=7)	AN (OFF)	Spring	Seminar: Behavioral and Emotional Problems of Children (N=4)	Zach 529 min. 89.3 %	Shawn 503 min. 93.0 %	
	AN	Summer	Advanced Studies: Legal & Ethical Issues in Special Education (N=3)	Jimmy 443 min. 84.0 %	Joyce 172 min. 94.3 %	
VI. GR Online Methods SE (N=9)	UMC	Summer	BD Online: Interactive Cases in Behavioral Disorders (N=9)	* Trisha (2) 179 min. 86.5 % Matthew (5) 223 min. 77.0 % Zach (2) 149 min. 73.0 %	Shawn (2) 294 min. 82.0 % Jimmy (2) 318 min. 100.0 % Amy (3) 347 min. 87.0 % Deangelo (2) 492 min. 96.0 %	

The semantic maps taken as pre and post measures of learning with analysis of nodes and links indicate learning or conceptual change with significance using $p < .05$ for undergraduate general education preservice teachers at a public institution. Details of this analysis can be found in Table 4.

Table 4: Semantic Maps Conceptual Change

Semester	Site	Course Name	Rank (N)	Conceptual Change: Nodes – Pre, Post, Sig. ** Links – Pre, Post, Sig. **
2004 Spring	CUP	Mainstreaming the Exceptional Learners	UG (18)	Nodes: 16.3 – 22.1 (Sig) Links: 18.1 – 24.0 (Sig)
	AN (ON)	Behavioral and Emotional Problems of Children	GR (5)	Nodes: 49.4 – 62.4 (NS) Links: 55.8 – 65.8 (NS)
	AN (OFF)	Seminar: Behavioral and Emotional Problems of Children	GR (4)	Nodes: 42.8 – 60.1 (NS) Links: 50.8 – 69.3 (NS)
	WVU	Characteristics and Methods of Behavioral Disorders	GR (25)	Nodes: 34.2 – 39.2 (NS) Links: 38.4 – 43.4 (NS)
	UCF	Methods of Behavioral Management	GR (8)	Nodes: 31.75 – 33.13 (NS) Links: 32.88 – 35.63 (NS)
2004 Summer	CUP	Introduction to Exceptionality	GR (24)	Nodes: 26.2 – 27.7 (NS) Links: 31.4 – 30.4 (NS)
	AN	Advanced Studies: Legal & Ethical Issues in Special Education	GR (3)	Nodes: 38.7 – 49.7 (NS) Links: 45.3 – 67.7 (NS)
	UMC	BD Online: Interactive Cases in Behavioral Disorders	GR (9)	Nodes: 31.0 – 44.0 (NS) Links: 40.4 – 52.0 (NS)
2004 Fall	UCF	Methods of Behavior Management	GR (20)	Nodes: 48.5 – 53.5 (NS) Links: 55.7 – 61.7 (NS)
	WVU	Classroom Behavior Management	GR (10)	Nodes: 26.0 – 35.4 (NS) Links: 26.3 – 36.0 (NS)
	AN	Introduction to Special Education	UG (6)	Nodes: 45.8 – 48.7 (NS) Links: 57.5 – 53.7 (NS)
	CUP	Behavior Principles I	UG (24)	Nodes: 14.6 – 23.4 (S) Links: 15.3 – 24.0 (S)

Application activities that extended from the cases occurred in general and special education courses both at undergraduate and graduate levels and across public and private institution(s). Levels of significance in learning occurring primarily in the extension of applications from the cases rather than guided transfers. Data analysis is depicted in Table 5.

Table 5: Extension Applications

Level of Usage	n	Change in Nodes			Change in Links		
		Pre	Post	sig	Pre	Post	sig
1 – Learning within the case	22	35.5	44.2	.027	41.2	49.2	.044
2 – Extending from the case	17	16.3	22.1	.002	18.1	24.0	.002
3 – Guided transfer to simulation							

4 – Guided transfer to real students							
5 – Independent transfer to real							
1+2 – Learning and extending	102	29.9	35.5	.000	33.8	39.4	.000
1+3/+4 – Learning with guided transfer to simulation or real	10	44.6	53.3	.142	54.8	59.9	.452

F. Educational or Scientific Importance of the Study

The findings of the study have yielded results that would lead one to believe special education teachers are more apt to be engaged in the learning process when using special education multimedia case studies than general education students. One might also believe students in private institutions, both undergraduate and graduate, spend more time engaged in the learning process and completion of the case tasks than students enrolled in public institutions. It cannot be determined without greater numbers, however, that these differences are significant or that they impact learning outcomes transferred to employment settings. It should be noted that extension activities which require students to build on case knowledge and apply their knowledge and skills into authentic situations appear to make the learning outcomes more meaningful, and ultimately, improve the conceptual outcomes of the teacher candidate. The following are suggestions for case-based instruction in teacher preparation programs.

- Encourage students to view the problem from new or different vantage points in order to develop knowledge and skills that can transfer to authentic society concerns.
- Structure activities for students to analyze the dilemma from alternative points of view and multiple perspectives.
- Use techniques to actively involve participants in the learning process through interactive activities, problem-solving discussions, and ongoing analysis of their conceptual change.
- Examine what private education and practicing teachers bring to the learning environment that raises their rates of task engagement and completion and whether increased engagement results in better learning outcomes, which transfer to employment settings.
- Case analysis may not solve the problem, but it can be used as a tool for solving problems (Kauffman, 2002).

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