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On the Cover

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Overcoming the Digital Divide: The Story of an Urban Middle School

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Abstract

Access to appropriate technological resources in schools has become an issue, commonly labeled the "digital divide." While the debate ensues in regards to an explicit definition for this phenomenon, research overwhelmingly demonstrates that students of marginalized populations remain on the lower end of ***access to*** *and* ***innovative use of*** *current digital technologies. Accordingly, advocates of social justice point to the disparities of resources and quality learning opportunities experienced by students in poverty, including their exposure to dynamic technology integration in teaching and learning. This study narrates a five-year struggle to impact the digital divide on an urban middle school campus.*

A Tale of Two Middle Schools: Setting the Stage for our Story

To get a glimpse of what is meant by the term "digital divide," one only needs to journey less than 20 miles from our university campus. Travel northwest and you will soon arrive at a public middle school of 600 students, grades seven and eight. Situated in an open, country setting, this school provides students with what can easily be described as a *technology-rich* environment. A hub of 6-8 computers is located in each classroom, with students and teachers using these machines in a variety of ways to explore curricular concepts. In addition, students have opportunities to take courses in computer labs, such as *Web Creation* and *Design and Video Journalism*. The course description for the web creation class states,

> The Web Creation and Design is a class that engages students with relevant assignments that solve real-world communication needs. Immersed in an authentic learning environment, students acquire important communication skills while becoming proficient in project planning and production, graphic and user interface design, JavaScript, HTML and XHTML programming, and more. The class is divided into groups that create real websites for non-profit organizations. The experiences obtained in this class prepare students for the real world. (Anthony Wayne Technology, 2005)

At this school, opportunities for learning with computers are supported by an attentive and responsive district technical staff. Hardware, software, and networks are upgraded and maintained. Teachers are confident that their equipment will be functional when needed.

Not far down the road, however, Ravine Junior High students (about 850 in all) encounter a vastly different scenario. This urban middle school is supplied with one computer lab and 4-5 computers in each classroom. The classroom computers contain a variety of operating systems, some which are 10 years old. The district network configurations force teachers to log on to one server if they need to print, another if they want to connect to the Internet, and another, if they need to access their grade books. Besides these complications, the network itself is often down, leaving teachers and students unable to access software, printers, and the World Wide Web. Because of this reality, some classroom computers are covered with plastic and never turned on. Work orders for various computer-related problems are taped to machines and remain there for months, with no response. Those teachers who do attempt to use the computers are encouraged to use the district's adopted curriculum software package to provide students with individualized practice in key subject areas.

Why are the computer experiences for these seventh and eighth graders so different in public schools that coexist only a few miles apart? What forces are shaping the policies and practices regarding technology integration at these schools? What, if anything, could be done, to make the Ravine experience more equitable? Does it matter? These are the questions we would like to address in the following article, as the process of school restructuring is explored. This study focuses **only** on Ravine Junior High, and the efforts employed to provide students and teachers with increased opportunities to utilize digital technologies for teaching and learning.

Working Toward Reform

Ravine Junior High School is the site of a federal Gaining Early Awareness and Readiness for Undergraduate Programs (GEARUP) grant that brings together resources from Bowling Green State University, the University of Toledo and a range of community organizations committed to change. The reforms at Ravine are based on what teachers and administrators have identified as student needs. These needs have been documented through ongoing and completed action research projects and literature reviews (Bernauer, 2002; Fullan, Bennett, & Rolheiser-Bennett, 1990). The evolution impacting

the digital divide that is documented in this article spans the work done by Ravine teachers, alongside university partners, from 2002 until the present.

The reform work at Ravine is based on the belief that school change and restructuring can be process-oriented. Researchers have worked to identify the key aspects of process-oriented change. Their analysis positions the work that the Ravine Junior High GEAR-UP team is engaging in as part of the range of "new" forms of work emerging: professional networks and school university collaborations which create job-embedded professional development opportunities (Grant, 1997; Guskey, 1998).

Funded through a GEAR-UP grant ("GEAR-UP," 2005), the original grant proposal laid out the goal of the work:

> Throughout what was formerly called the rust-belt, public schools and school districts are struggling with issues of accountability, achievement, standards, assessment, and equitable funding. As educators within public universities in the region, we identify a special responsibility to look at the link between the shifting economic conditions in our cities and the status of our public schools. Our overarching aims are to learn from each other, to offer mutual assistance based upon our experience working for educational change, and to capitalize upon the specialized knowledge that each agency brings to this partnership. (Kretovics, Armaline, & Klonsky, 1998)

A Review of the Digital Divide

While the exact origin of the term *digital divide* cannot be determined (Foster & Borkowski, 2004; Wikipedia, 2005), it has been in use for over a decade. Politicians, scholars, educational leaders, policy makers and activists frequently employ this phrase when addressing issues of empowerment and democracy (Williams & Alkalimat, 2002). These discussions preceded the interest in documenting the digital divide phenomenon through the use of various identifiers, including types of Internet or computer access (both quality and quantity), and available and/or actual uses of these technologies (Angus, Snyder, & Sutherland-Smith, 2003; Attewell, 2001; Moghaddam & Lebedeva, 2004; Morse, 2004; Solomon, 2002).

Access has been traditionally defined as *the right or ability to log on to a computer system or use a computer program*. When focusing on *access,* data is often collected regarding the number of computers present in a certain geographic space (school, library, home, community), the ratio of people to computers, or the number of computers equipped with Internet connections. While the United States, as a whole, statistically surpasses most other nations in these measures, stark inequities have been documented within its borders. Minority and low SES populations have consistently been shown to have less access to technological resources (Gorski, 2002; Hayden, 2003; Norris & Conceicao, 2004). These inequities are present, regardless of the unit analyzed. Be it home, school, or community, the wealthy and powerful, without fail, enjoy the benefits of more computer resources.

Beyond *access*, however, lies the reality of *opportunity for use* in the digital divide debate. Those who collect statistical data on the number of computers and Internet connections oftentimes interpret this information as reflecting progress in narrowing the divide. However, just because computers are present, one cannot immediately assume that they are functional and put to use. Especially in school settings, studies have shown that marginalized student populations receive little or no opportunities to use computer technologies in productive and creative modes (Bull & Bull, 2003; Milone & Salpeter, 1996; Swain & Pearson, 2001). For example, computers used for primarily word-processing or "drill and kill" exercises represent low-end experiences for students. However, computers utilized for more constructivist activities such as research, project development, or collaboration demonstrate challenging experiences for students. Oftentimes, students lacking the most resources receive little or no quality opportunities for use in their school settings. As these practices persist, students are being denied experiences that have been shown to increase their chances for meaningful employment and educational opportunities.

Multiple factors have been shown to impact effective technology integration in schools. The International Society for Technology in Education identifies these factors, labeling them "Essential Conditions" (ISTE, 2009). These include:

- Shared Vision
- Empowered Leaders
- Implementation Planning
- Consistent and Adequate Funding
- Equitable Access
- Skilled Personnel
- Ongoing Professional Learning
- Technical Support
- Curriculum Framework
- Student-Centered Learning
- Assessment and Evaluation
- Engaged Communities
- Support Policies
- Supportive External Context

Obviously it would be extremely difficult to address all of these topics in one study. This research focuses on Ongoing Professional Learning and Technical Support as two of the conditions addressed for digital divide impact. The following paragraphs summarize the Ravine Junior High School's approach in addressing these digital divide issues in their reform initiatives.

As a part of the restructuring efforts of the GEAR-UP team, issues of equity were explored, to determine the most acute student needs, related to supporting students in con-

tinuing their education. From this analysis, the team targeted student access and use of computer technologies as an area of need. The majority of Ravine students are part of low SES and minority populations; as noted earlier, research has shown that most of these students do not have home access to up-to-date computers or Internet services (Bull & Bull, 2003; Gorski, 2002; Moghaddam & Lebedeva, 2004; Morse, 2004). Besides the lack of home technology resources, students did not have a great deal of computer access while at school and were not challenged to use computers at school in a concerted manner.

The conditions at Ravine mirrored the disparities that have been documented extensively, in the past decade, and the term *digital divide* is commonly used to identify these issues. As delineated above, key aspects of the digital divide phenomenon for marginalized populations include limited or no technology access apart from school, limited or no technology access as a part of school and school technology use focused on drill-and-practice applications or word-processing. While teachers couldn't significantly affect student home computer access, they have begun to strategically provide students with technology-rich experiences at Ravine, targeting the latter two elements for change.

Access Defined: Technological Landscape of Ravine

Prior to GEAR-UP at Ravine High School, the school received a grant from the state named "Raising the Bar." The grant provided monies to install wiring and purchase computers, projectors, digital cameras, and various other technologies for the school. Although training and support were offered to staff, two key issues arose following the completion of the grant that caused the application of technology to decrease. The first issue involved teacher turnover. In the core academic areas, approximately 63% of the educators either transferred or retired after Raising the Bar was introduced. This left only 37% of the teachers in the building active since Raising the Bar. Of these 37%, many were 'elder statesmen' who either were unwilling or afraid to incorporate technology in their classroom. Realistically, teachers who remain at Ravine Junior High and incorporate technology in their classrooms represented only 11% of the staff.

While new faculty might have been open to integrating computer technologies in their classrooms, they had many obstacles to overcome. Besides lack of training, the unreliability of their classroom computers was a major hindrance. As identified in the opening vignette of this article, many machines were non-functional. Some lacked the software needed for the learning activities identified. Some were unable to connect to classroom printers or the Internet, because of various district network and server issues. Some would not even "boot up." Work requests to fix these problems could go unanswered for weeks, even months. Teachers learned quickly that they could not depend on their classroom computer systems, and opted to teach without them.

While the units in Ravine's computer lab were more stable, network issues made Internet access a precarious enterprise. The servers were "down" weeks at a time, and when connections could be made, they were oftentimes excruciatingly slow. The district's security systems and firewalls also blocked many of the websites teachers desired to use with their students, so most became discouraged and refused to incorporate Internet use in their lessons. In fact, most teachers would not even attempt to access their school email account, because of the instability and slow connections in the system.

The district's illogical labyrinth of networks and servers further exasperated the teaching staff. For example, Ms. Black may have scheduled the computer lab, as her students began a research project on Greek Mythology. Students were to use their time in the lab to explore several key websites that she had identified and collect information to be used in their final class presentations. For this activity, the technology instructor suggested that students log into the district's App Server, in order to get a faster connection. Once connected to this server, however, students could not save their work to their 205 Server (the server that their classroom computers could save to). They could not print from the App Server, either, as the printing configurations were routed through the District Server. To further complicate matters, teachers could log in with specific identifiers to access their gradebook software, but in this mode could not access the server where student work was stored, or navigate to other applications. If a student or teacher was using the scanner (logged in on another server), the file couldn't be saved in a shared server space or printed. These situations reinforced their distrust and disinterest in incorporating computer technologies in their classrooms.

Interestingly, if data on *access* had been collected at the Ravine site, it would have showed positive growth over the past six years. More computers had been added to the building and in core classrooms. All computers, in the lab and in classrooms, were wired for Internet access. The ratio of students to computers was significantly lower. The district could certainly make the case that issues of the digital divide were being addressed in this school. However, lack of adequate tech support, because of strained budgets in city schools, kept the computer systems in a non-functional state. While schools in wealthier areas continued to have their computer systems well-maintained, this urban middle school struggled to acquire adequate assistance. Thus, students were denied *access* and *use* of technologies that could impact their future educational and employment opportunities. Supporting Ravine's teachers through years of job-embedded professional development has begun to make a difference in these inequities.

Deeply Embedded Professional Development

Job-embedded professional development has been the primary method for combating the digital divide present at Ravine Junior High. This deeply embedded professional development (DEPD) (Fischer & Hamer, 2004) arises from

careful examination in the field of staff development. Traditional professional development opportunities, characterized by one-shot, one-way programs are not effective; these should be replaced with long-term, collegial work. (Hixson & Tinzmann, 1990; Sparks & Hirsh, 1997; Stronge, 2002; Wood & Thompson, 1993; Zimmerman & May, 2003) DEPD requires commitment over time, an entry stance of active listening, and a dedication to the transformation of teachers and reformers into significant partners/equals in the professional development process.

Many professional development efforts are built on the notion that teachers are the only ones who need to improve, and that inservice should only respond to immediate needs. Traditionally, professional development activities have not been carefully evaluated in terms of overall value or effect on instruction (Guskey, 1998). In many urban districts the assumption is that inservice should be district wide rather than focused on the unique needs of a school, that teachers will automatically transfer what they learn into their classrooms without assistance (Wood & Thompson, 1993). However, more recently staff development planners have recognized the need to consider content, format, and duration of participation. Stronge (2002), for example, notes that "high-quality professional development activities….must be collegial, challenging, and socially oriented" (p. 64). Researchers increasingly note that teacher networks and collaborative structures between schools and universities hold promise (Darling-Hammond & McLaughlin, 1995). To that end, the Ravine teachers were charged with the task identifying the path of professional development that would impact the challenges with digital technologies that they faced.

Modules and Other Modes of Professional Development

Professional development at Ravine Junior High, then, has been formulated within multiple constructs of job-embedded, democratic school change. University partners have worked to become "finely attuned to the realities of teachers' everyday experiences and the practical tasks they face" (Fischer & Hamer, 2004). Since 2002, Ravine teachers have identified representatives from their instructional teams to convey their needs and ideas to a professional development committee. These committee members are in regular communication with the teaching staff that they represent; needs and issues are shared and possible solutions are brainstormed. Each summer the professional development committee composed of twenty-plus teachers has met to begin planning the next year. A survey of staff is collected as well as reflective essays from each teacher/faculty participant in the previous year's professional development activities. From the surveys, reflective essays and general discussion on issues and directions for school change the members of the committee begin to generate a list of modules to be offered to the staff. Over the last five years a significant series of offerings have focused on technology use and integration. When describing the purpose for these module 'courses' we identified the main purpose as "to assist middle school educators at Ravine Junior High in looking at their own practice and educational institution." The courses focused on specific modules each with an action research component as a means of inquiry into our own daily experience as educators.

During the 2002/2003 school year our first specific technology module was developed. It was focused on teacher 'tools,' computer uses that were teacher-centered and tied to their daily experiences and work. Software that kept electronic grade books, use of the district e-mail system, accessing the Internet through the district server, and basic PowerPoint were central to the goals of the module. Modules lasted for seven weeks, meeting for two-and-half hours, one day each week. The instructors, including the junior high's technology teacher and three university faculty members, team-taught the modules.

Much to our surprise, the twenty seats available in the school lab for the modules were quickly reserved and we had a waiting list. We had attracted a significant number of teachers to the issue of technology use. Could we begin to increase the technology's use in day-to-day classroom life? Over the course of the module it became clear that participants were interested and willing to learn. The completed electronic files with examples of their work with each tool were submitted at the end of the course. At the same time, they began to critique the technology in their building, and share their frustration and struggles to use it and keep it working. This significantly increased the number of times classroom academic teachers were calling on the technology teacher to help fix something, submit a work order for equipment, or access lines that were not working. The winds of change were beginning to blow.

During the 2003/2004 academic year the professional development committee agreed to offer a second section of the tech tools module now to be called Tech 1. We also agreed to begin developing a second module called Tech 2 that would shift the focus from teacher tools to teacher use of technology with students. Tech 2 encouraged teachers to ask "What computer software or Internet research skills might be utilized by students?" and "What did the International Society for Technology in Education (ISTE, 2004) standards and Ohio Academic Content Standards in Technology ("Ohio academic content standards for Technology, " 2004) outline as goals for teachers and their students?" These questions became the focus of our second module. The following table iterates the topics for both modules (refer to Table 1).

As a part of the technology workshops, teachers were challenged to complete a lesson *in their own classrooms,* rather than the computer lab, that integrated computer technology. This lesson had to address specific curricular goals, as well as a component of the National Educational Technology Standards for Teachers (NETS-T) (Kelly, 2002). In this way, students experienced digital technologies that supported their learning, and also developed their technology skills. Teachers showcased these lessons at a celebration event in the spring, displaying posters, websites, and video that documented

Table 1
Tech Module Topics

Agenda for Technology Module 1 'Teacher Tools'	Agenda for Technology Module 2 'Technology and Curriculum'
Making the Grade (2 Sessions) GradeBook Section 2nd Session – Lab Time Accelerated Reader (1 Session) Internet & Email (1 Session) Training on email, search engines, Boolean logic Using Digital Cameras in the Classroom Microsoft PowerPoint (1 Session) The 4-6 Computer Classroom *Others, as requested by the participants (Examples: Microsoft Excel, Advanced PowerPoint)	Smart Boards Webquests Day One: Introduction & Research Day Two: Build a webquest. Making the Grade Advanced Options Standards/Distance Learning Standards (ISTE & Ohio) Distance Learning Tech Project (2 Sessions) Participants will create their own project to use with the students *in their classroom.*

their technology integration success stories. The excitement generated through this sharing of their accomplishments in technology integration became contagious, as other faculty members became interested in designing lessons that included technological components. They looked toward the next school year, and challenged themselves to increase student experiences with computer technologies in their classrooms.

Digital Storytellers

Ravine teachers were introduced to the concept of digital storytelling when a team from the Center for Digital Storytelling (Lambert & Mullen, 2004) in Berkeley, California visited the school in January, 2004. This team was invited after a few of the Ravine faculty had experienced a digital storytelling presentation at a nearby university. These teachers wrote a mini-grant proposal to fund the short residency. The visitors worked directly with a small group of students and teachers in creating digital stories that combined written and recorded text with still images and music. Teachers began to see how students could become media makers, expressing their thoughts in new and powerful ways. When the Digital Storytellers departed, faculty began brainstorming ways to get the equipment and tech support needed to provide these types of media-writing opportunities for students. Several wrote grants for laptops and digital cameras, while others lobbied for additional training. From these efforts, and in conjunction with the technology modules, a professor in classroom technology began to work with teachers and students in the area of digital storytelling.

During the 2004/2005 school year, in an effort to facilitate the teachers' implementation of expanded technology use, the technology professor (Dr. B) who had worked with them during the previous semester committed one full day each week to Ravine. Dr. B spent every Tuesday at Ravine Junior High, co-teaching with teachers, as they explored new ways to support student learning through the use of computer technologies. She assumed the role of "Jack of All Trades," and relied on the teachers to identify the projects, software, and technology needs of their classrooms. In addition, Dr. B worked as a liaison between the teachers and district tech support staff to communicate issues related to technology integration.

These "Technology Tuesdays" served to keep teachers encouraged, as they struggled to use equipment that was still unreliable and outdated. Teachers began to check their school email accounts, since Dr. B used the system to communicate with them about tech plans and problems. They were sometimes rewarded for these efforts with blank CD's, technology magazines, or pieces of chocolate. Various student projects were shared via email and posted on the website developed by Dr. B to celebrate the progress being made. And when teachers just didn't feel like being positive, Dr. B served as a sympathetic ear, listening to the frustrations of those faced with downed networks and faulty printers. Over time, equipment was serviced (at least some of it) and students were offered increased access to technologies in the building. Currently, several teachers, as well as the school principal, have transitioned into these roles of informal technology support, providing teachers with daily access to encouragement and hands-on assistance for technology integration.

Some of the projects Ravine students and teachers completed, with Dr. B's support, are listed in Table 2. These projects represent a shift from little use of computer technologies in the classroom to creative and powerful uses of digital technologies in the classroom. While these projects were completed in the 2004-2005 school year, these ideas have expanded and morphed into additional digital technology activities continuing into the 2007-2008 school year.

As teachers began sharing their ideas and experiences in using classroom technologies, those who had not specifically participated in the yearly workshops also became more vocal regarding technology integration in their classes. During the 2005-2006 and 2006-2007 school years, several Ravine teachers spent time offering updated technology sessions on using district resources such as United Streaming (a media database) and student email. The school building committee members, as well as the principal, have encouraged the efforts of teachers to continue to explore and implement various technologies. Teachers also eagerly provided tech support to their colleagues, helping to offset the frustrations of downed

servers or lost printer connections. The Ravine staff identified tech-savvy students that were able to assist them in keeping the computers up-and-running. Access and use continued to increase, as communication about technology integration and comfort with the technologies available spread.

DEPD Impact on the Digital Divide

As a result of their continued professional development regarding computers in the classroom, teachers evaluated *access* and *use* issues related to educational technologies in their building. Just a few years ago, lack of school computer access for students was apparent at several levels. Early on, computers were not physically present in most Ravine classrooms, but as various state initiatives provided the hardware, other issues of access emerged. Many classroom computers were not reliably operational. Connections to printers and the Internet were sometimes non-functional for months, needed software was not installed, and "mice" were constantly unusable because of student removable of the mouse balls. Even if these issues were resolved, many teachers did not work to provide students with activities that allowed or required the use of the classroom computers. Thus, students had little access.

Change Over Time

Now, as teachers have become more concerned and vocal about using computer technologies for teaching and learning, local tech support is improving. While issues still exist, most classrooms have machines that boot up, connect to the Internet, and print. The increased attention to technologies by teachers and their GEAR-UP university partners has resulted in some positive interest from the school district's technology staff. In addition to getting the computers operational in the building, student access has been improved as teachers plan lessons that utilized digital technologies on a regular basis. The interest and expertise now evident among the leadership and staff at Ravine insures the sustainability of the work, even as GEAR-UP grant funding is coming to an end.

Previously, most of the experiences students did have with the computers only incorporated drill-and-practice type software or word-processing. This limited use of computer technology for marginalized populations has been cited as a major source of inequity, when compared to more privileged student groups (Gorski, 2002; Milone & Salpeter, 1996; Morse, 2004; Swain & Pearson, 2001). The need to balance drill and practice activities with rich technology experiences requiring higher-level thinking was apparent. As teachers identified and pursued a course of action to address this digital divide issue, more creative uses of computer technologies have been integrated into their lessons.

Teachers at Ravine Junior High, supported by the GEAR-UP team, have begun to provide their students with what Gorski (2001) would identify as "equality in access" and "equity in opportunity." Efforts to make computer hardware accessible and functional in most classrooms, as well as the computer lab, have provided students with more hands-on technology experiences in school. DEPD has allowed teachers to direct their own professional growth in the use of digital technologies for teaching and learning. Because of this, students are being challenged to use computers in "intellectually exciting educational experiences" (Becker, 1992) that parallel experiences shared by most non-marginalized student populations. The process has been slow, and many frustrations have been encountered along the way, but the evidence is clear. The digital divide can be bridged, or at least narrowed, as

Table 2
A Sample of Technology Integration Projects at Ravine

Digital Video	The creation of a 10-minute digital video about Ravine's summer experience for incoming 7th graders
Web Design	An academic team's website containing webpage resources for all content areas
Webquests	A Webquest for a Unit on Greece
Smartboard	Incorporating the Smartboard in various units of instruction
Digital cameras and digital audio	Digital stories created in language arts classrooms
Digital cameras and DVD	DVD creation targeting the Elements of Art in an art classroom

Module 1	Module 2	Digital Storytellers	Tech Tuesdays	Tech Tuesdays Tech Connections	Tech Tuesdays

Figure 1. Ongoing Professional Development & Technical Support

educators continue to challenge themselves and their students to integrate digital technologies into their curricula.

Implications

Districts, and the schools in them, face many competing policy decisions as they work to improve academic performance. In the area of technology, school district personnel must make choices concerning the purchase of hardware and software, what type of networking systems to provide, what type of access to the Internet will teachers and students have, and, based on this study's findings, what ongoing professional development and technology support will be provided to the instructional professionals at the point of instructional use.

It is clear from this study and ongoing data collection that one or two courses—the quick and dirty 'how to' workshops, are a starting point but not sufficient for deep technology integration into the teaching and learning process. Five years working with Ravine Middle School have told us that overcoming the digital divide takes:

- Initial hardware and software purchases—the technology must be present
- Circularity—workshops focused on training teachers on best practice software and hardware and then making that hardware and software present in their instructional environment
- Develop teacher interest and desire (intrinsic motivation) to apply technology knowledge and skills through explicit classroom and curriculum-based support and professional development
- Ongoing technology support—significant, one on one support that trouble shoots and builds confidence and skills
- Deeper professional development for those ready to move beyond novice uses of technology over time

We are ever aware of the enormous implications and the impetus to dismantle the digital divide (Gorski, 2002). And aware of the struggle to provide urban young people use of technology that is creative, and generative (Bull & Bull, 2003; Gorski, 2002). Ultimately, this study has shown that overcoming the digital divide is possible. Time, dedication, money and respect for the lives of urban teachers all being essential to the future impact of technology in schools that find themselves on the short side of that divide.

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Cheating Perceptions and Prevalence Across Academic Settings

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Abstract

This study investigated high school students' perceptions of cheating and its prevalence. Students were administered the Academic Honesty Survey to determine their perceptions and prevalence of cheating across three academic settings: tests, homework, and report writing. Overall, students had traditional perceptions of what constitutes cheating. Despite these perceptions, most students cheated. In addition, cheating perceptions and prevalence varied across academic settings. Perceptions and prevalence declined going from test to homework to report writing settings. Three other interesting patterns emerged. First, cheating was tied to effort. Cheating actions that still required students to exert effort were viewed as less dishonest than those that required little effort. Second, cheating was tied to giving versus receiving. Giving information was viewed less harshly than receiving it. Last, cheating perceptions were tied to environment. Cheating behaviors occurring outside the classroom were viewed less harshly than those occurring inside the classroom.

"Just because you plagiarize, that's not like cheating," a freshman high school student informed his teacher, the first author of this article. The student could define plagiarism, and he described various methods of cheating for tests and other schoolwork, but he simply did not recognize that plagiarism is cheating. "Teachers don't tell you plagiarism is cheating; they just tell you not to copy and paste," he argued. This conversation led the teacher, in partnership with educational psychologists, to investigate high school students' perceptions about and prevalence of cheating. How many other students have misperceptions about academic dishonesty and how many students actually cheat?

Cheating is a pervasive problem within American high schools. The topic of student cheating has been researched—both in terms of perceptions and prevalence. In terms of prevalence, most studies report that about 75 percent of students cheat. Bruggeman (1996) compared prevalence of cheating at secular and parochial schools. He found that cheating and lying were prevalent at both types of schools, with between 70 percent and 80 percent of students engaging in dishonest actions. Somewhat surprisingly, cheating was no more prevalent at one type of school than the other. Similarly, Whitley (1998) reported that nearly three in four students admitted to cheating on academic work. Moreover, McCabe's (2001) study of 4,500 U.S. schools reported that 74 percent of students admitted to cheating on exams and as many as 90 percent of students admitted to using the Internet to plagiarize. According to many commentators, educators, and researchers, the phenomenon of cheating has reached "epidemic" proportions (e.g., ABC News Productions, 2004; McCabe & Stephens, 2006).

The prevalence of cheating now seems particularly pervasive where digital technology is involved. The rapid expansion and development of digital technology has transformed academic cheating into "digital cheating." In a recent *New York Times* article, educators and school administrators spoke about how digital forms of academic dishonesty are on the rise (Glater, 2006). One possible reason for this increase is the huge amount of information that is rapidly accessible via computers, personal digital assistants (PDAs), search engines, instant messenger systems, cell phones, and MP3 players/ iPods™. Students are now capable of using these systems to plagiarize, take credit for work done by others, falsify data, and download articles to copy and paste on tests and assignments.

In terms of perceptions about what constitutes cheating and the origin of faulty perceptions, students often blame their cheating on teachers' failure to explain cheating adequately (recall the student's comments at the start) or to enforce academic honesty (McCabe 1999). Students might be right. Less cheating occurs when students are taught ethical guidelines (Ames & Eskridge, 1992; McCabe & Treviño, 1993). And, McCabe and colleagues (McCabe, Treviño, & Butterfield, 2001) found that although teachers support academic honesty policies, they are reluctant to punish cheating. As a result, students witness their peers cheating and getting away with it. Consequently, they come to perceive cheating as commonplace and acceptable.

Educators, meanwhile, often attribute cheating to a fault in students (Anderman & Midgley, 2004). Anderman and Midgley conducted a longitudinal study investigating changes in students' perceptions of cheating behavior. Results

showed that cheating increased as students' transitioned from middle school to high school and that students' perceptions of school and classroom environments were related to their cheating behaviors. In particular, perceptions about cheating changed in accordance with the goals that were emphasized in students' classrooms and schools. Murdock and Anderman (2006) confirmed that students' goals are related to their decisions about cheating behaviors. For example, one or more of the following goals might influence a student to cheat: getting a good grade, avoiding looking incompetent, or impressing the teacher or peers. Similarly, Jordan (2001) believes that students' perceive cheating as wrong but do it anyway because they neutralize their moral standards. Common neutralizing techniques include diffusing responsibility (e.g., "Everyone copies homework assignments from friends."), minimizing consequences (e.g., "Teachers don't even watch us during the test. I won't get caught."), and euphemistic labeling (e.g., "It does not count as cheating because I copied just a few sentences from the Internet source.") (Stephens, Young, & Calabrese, 2007).

Although previous research confirms why perceptions about cheating might change or be at odds with behaviors, it does not reveal students' perceptions about what behaviors actually constitute cheating. Moreover, existing research investigates academic dishonesty as an all-or-nothing behavior when it is possible that students might think and act differently about cheating in different academic settings. For example, a student who believes sharing test answers is dishonest and not do it might believe that sharing homework answers is okay and do it. Moreover, context-specific perceptions and behavior might be at odds. For example, students who perceive that copying test answers is dishonest might do so nonetheless. Therefore, it is important to measure both cheating perceptions and prevalence across academic settings. The present study, then, examined cheating across three common academic settings. Students were asked to gauge their cheating beliefs and actions germane to settings involving testing, homework, and report writing. By evaluating students' cheating beliefs and actions across settings, educators might better gauge students' cheating perceptions and actions, educate students about cheating, and control it.

Methodology

Participants

Participants were 100 high school juniors from four 25-student English classes in a large Midwestern high school. This public high school enrolled students primarily from middle SES homes who, on average, had ACT composite scores of 24. Juniors were included because they had sufficient opportunity to form perceptions about cheating and to practice or counter those perceptions. On average, participants had a grade point average (GPA) of 3.0 on a four-point scale, worked about eleven hours each week, and spent between one and ten hours per week participating in extracurricular activities.

Instrumentation

The primary researcher developed the 18-item *Academic Honesty Survey* (found in Appendix A) for this study in conjunction with other high school teachers, an academic dishonesty researcher, and an expert in survey construction. In addition, survey construction was guided by literature on academic dishonesty instruments and cheating behaviors (e.g., Anderman & Midgley, 2004; Stephens et al., 2007). Three preliminary items gathered information about students' GPA, weekly employment hours, and weekly extracurricular participation hours in order to determine if these factors related to cheating. These three factors were examined because of their interrelationship and potential relationship with cheating. Academic achievement is somewhat negatively affected by part-time employment (Singh, 1998) and somewhat positively affected by extracurricular activities (Marsh, 1992). Previous research with college students found that cheating was mildly more prominent among those with lower GPAs and those with greater nonacademic responsibilities (McCabe & Treviño, 1997). The main items reflected three main facets of schoolwork: taking tests, completing homework, and writing reports.

Each main item posed a specific scenario and asked two questions: a) Is this cheating, YES or NO; and b) Estimate the number of times you have performed this action as a high school student: (1) 0, (2) 1-2, (3) 3-4, or (4) 5+. The first five items asked students to determine if certain test-taking behaviors are cheating: (1) glancing at a classmate's answers, (2) providing answers, (3) using notes prepared outside class, (4) sharing test questions following an exam with someone yet to take the exam, and (5) sharing test answers following the exam with someone yet to take the exam. The next six items related to homework assignments: (6) completing take-home tests with a partner, (7) copying take-home test answers from a classmate, (8) copying a classmate's homework answers, (9) doing individual homework with a partner, (10) giving a completed assignment to another student, and (11) submitting a classmate's assignment as one's own work. The last four items pertained to completing a report: (12) basing the paper on a movie instead of reading the required text, (13) using *Cliff's Notes* or some other note service instead of reading the required text, (14) downloading information from the Internet as your own, and (15) failing to credit a source in the report.

Procedures

Participating students in four different English classes completed the *Academic Honesty Survey* at the start of the class period in their respective classrooms on the same day. The primary researcher administered the surveys to each class. The surveys were distributed and verbal instructions for completing the survey were given. In particular, students were asked to answer honestly, knowing that their answers would remain anonymous. Students had the opportunity to ask questions before beginning the survey. All students completed the survey within fifteen minutes.

Results

Students' responses were first analyzed with respect to the demographic variables of GPA, work time, and extracurricular activity time. These variables did not affect significantly students' perceptions of cheating or cheating prevalence (all *F*s < 1). Therefore, students' responses were examined collectively with regard to cheating perceptions and prevalence in each of the three academic settings: tests, homework, and reports. Results from each academic setting are described in turn, and all data are found in Table 1 in Appendix B.

Tests

Students' responses to cheating in test situations are presented in the upper portion of Table 1. The perception data down the left column indicated that most students had a strong and traditional perception about cheating with regard to test taking. In most cases, 85 percent to 95 percent of students believed these test-taking behaviors constitute cheating. The lone exception is in how students responded to providing test questions to others yet to take the test. Surprisingly, only 47 percent considered this action to be cheating.

Two interesting patterns emerged from the perception data for tests. First, students' perceptions of test honesty seemed linked to effort. Students generally believed it is okay to supply test questions to other students yet to take the test (47 percent thought this was cheating), but it is not okay to supply answers (84 percent thought this was cheating). In the supply questions case, the recipient must still expend effort to answer given test questions; in the supply answers case, the recipient need not expend effort. Second, students perceived actions taken outside of the testing area as more acceptable than if they occur during the test. For example, 94 percent thought that providing test answers during a test was cheating, whereas just 84 percent thought that providing test answers outside of class was wrong.

There is discord between students' test-taking perceptions and actions. Even though most students believed six of the seven actions to be cheating, the bulk of students admitted to cheating in these ways. The upper-right column of Table 1 confirms that 59 percent to 87 percent of students cheated on tests in these ways at least once. Examining the test prevalence data in Table 1, the most prevalent behavior is glancing at other students' papers (87 percent).

Homework

The middle section of Table 1 shows student perceptions and prevalence for cheating on homework. Note that the perceptions for homework are lower than those for testing. In general, students condone dishonest homework practices more than dishonest test practices.

Two interesting patterns emerged from the perception data on homework. First, students' perceptions of homework honesty again seemed linked to effort. When little effort is involved, such as when submitting someone's work as one's own (93 percent) or copying someone's answers for a take-home test (88 percent), the action was perceived as more dishonest than when students must still put forth effort, such as when doing individual homework with a partner (23 percent) or when doing a take-home test with a partner (67 percent). Second, students' perceptions of cheating depend on whether information is given or gained. More students believed "turning in someone else's previous work as your own" to be cheating (93 percent) than "giving a completed assignment from a previous class to another student" (68 percent). They found "giving" less serious than "getting." When giving one's work, it does not mean necessarily that the work will be used fraudulently, so the behavior was not commonly viewed as cheating. However, using someone else's work by submitting it as your own was clearly perceived as cheating.

Despite a strong indication that several homework practices were considered cheating, students admitted to performing these actions. For example, 93 percent of students declared submitting another student's assignment as their own to be dishonest, but 20 percent of students did this at least once. Students seemed especially prone to ignoring instructions to complete homework individually. Ninety-one percent completed individual homework with a partner and 60 percent gave their completed assignments to a partner. The prevalence of homework cheating might actually be underestimated because of lack of opportunity. For instance, some students might not have ample opportunity to give a completed assignment to another student or submit another student's work.

Reports

In terms of report writing, students' perceptions of cheating are again linked to effort. Few students believed that consulting outside sources to write a report rather than reading the book is cheating. As shown in the bottom portion of Table 1, just 39 percent believed that using a movie to write a book report is cheating, and 53 percent believed using sources like *Cliff's Notes* to write a book report is cheating. This kind of shortcut to writing a report is not viewed as dishonest, perhaps because students must still put forth effort to write the report themselves.

Conversely, students perceive the less effortful direct use of someone else's work as cheating. Table 1 shows that 83 percent believed using Internet information as your own is cheating, and 66 percent believed it is wrong to use someone's ideas as your own. From the opposite—and more startling—perspective, however, one-third of students believed that it is acceptable to plagiarize.

In terms of behaviors, roughly 50 percent of students engaged in these dishonest—or at least questionable—behaviors. These indices of behavior might again be somewhat restricted because of opportunity. For example, there are not always movies or *Cliff's Notes* available for the required book. Moreover, movies might be quite different than the book.

Discussion

The results of this research revealed that most students have traditional perceptions of academic dishonesty. The majority recognized most traditional forms of cheating, though some maintained beliefs that strongly contradict most school handbooks. It seems shocking that even 6 percent of students believed that providing answers during a test is not cheating, or that 54 percent believed that plagiarism is not cheating. Even though most students had a traditional view of what defines cheating, many still cheat. For instance, 85 percent believed glancing at test answers during a test is wrong, yet 87 percent did so.

The disconnection between cheating perceptions and behaviors does not fit well with traditional moral reasoning theory (Kohlberg & Candee, 1984) that posits that people will do what they believe is morally right. The disconnection, though, fits with more contemporary theory (Turiel, 2006) that posits that people do not always do what they believe is morally right. Instead, they weigh other personal considerations that might run counter to moral beliefs. A high school student, for example, might believe that copying a test answer is wrong morally but do it anyway because attaining a high GPA and entering a selective college are personal considerations that outweigh and override moral ones.

Perceptions and prevalence of cheating vary across academic tasks. Generally speaking, perceptions about what constitutes cheating declines from test taking to homework completion to report writing contexts. Cheating behaviors generally decline as well moving from test taking to homework completion to report writing contexts. This odd pattern means that students actually cheat more in academic contexts where they well recognize their behaviors as cheating. This pattern signifies that knowing what constitutes cheating is certainly no deterrent to cheating. As to why cheating is most prevalent in testing contexts, students might view tests as high-stakes (Carnoy, Elmore, & Siskin, 2003) outcomes likely to influence academic and professional careers. And research confirms that students face pressure to cheat in high-stakes testing environments (Nichols & Berliner, 2007). Alternatively, students might simply be more ill prepared to answer test questions from memory than to complete homework or write reports using available resources. Inadequate test preparation due to ineffective cognitive strategies (Gubbels, 1999; Rachal, Daigle, & Rachal, 2007) has been linked to cheating (Anderman & Murdock, 2007).

Three other trends emerged. First, cheating was related to effort across academic tasks. Dishonest actions requiring little effort were more likely perceived as cheating than those requiring greater effort. For tests, divulging test answers was perceived more dishonestly than divulging test questions, perhaps because the latter still requires effort (to answer the questions) on the part of the recipient. For homework, less effortful actions like submitting someone's work as one's own or copying someone's answers for a take-home test were perceived more dishonestly than more effortful actions such as doing individual homework with a partner or doing a take-home test with a partner. For reports, less effortful plagiarizing actions were perceived more dishonestly than more effortful actions such as using movies or *Cliff Notes* to help write a report.

Second, cheating was defined, in part, by whether information was given or received. And students clearly thought that it was better to give than receive. For example, just 68 percent believed it was wrong to give a completed assignment to a classmate, but 93 percent believed it was wrong to receive and submit someone else's work as your own.

Third, students perceived actions taken outside of the classroom as more acceptable than similar actions taken inside the classroom. For example, more thought that providing test answers during an in-class test was cheating than providing test answers outside of class. Moreover, students generally perceived out-of-class misdeeds associated with homework and report writing as more acceptable than such in-class deeds during testing. The apparent relationship between environment and cheating perceptions might hinge on teacher monitoring. In the in-class test environment, versus outside of class, students are monitored more closely and have a greater chance of getting caught by their teachers. Perhaps the added risk of getting caught makes the in-class offense seem more serious than the out-of-class offense.

In terms of implications, students should a) expand their perceptions of what constitutes cheating and b) behave more ethically across academic settings. Teachers, of course, can be instrumental in changing students' cheating perceptions and actions. In terms of perceptions, teachers can provide and discuss with students written policies or guidelines about what constitutes cheating. Students who are aware of cheating policies cheat less often than those who are unaware (Ames & Eskridge, 1992; McCabe & Treviño, 1993). Our own informal Internet search of "academic honesty guidelines" uncovered numerous published materials that teachers can adapt for their students. In terms of actions, three teacher practices might reduce cheating: a mastery learning orientation, tougher sanctions for misdeeds, and better monitoring.

Research has confirmed that students are less likely to cheat in mastery-oriented than performance-oriented settings (Murdock & Anderman, 2006). In mastery-oriented settings, students perceive a task's intrinsic value and seek to master it. The learning process is enjoyable, engaging, or rewarding. In performance-oriented settings, students instead perceive a task's external benefits like high grades or a spot on the Honor Roll. Students seek a certain product but are not always concerned about the process for achieving it. Some take short cuts and even cheat to attain their goal. Teachers can raise the intrinsic value of academic tasks and reduce cheating by making tasks more valuable in their own right and by minimizing evaluation procedures that stress high performance over mastery (see Anderman, 2007).

In terms of sanctions, research shows that less cheating occurs when schools establish, communicate, and enforce an honor code that includes serious penalties for cheating (McCabe, Treviño, &Butterfield, 2001). These researchers point out that when teacher reaction to failure is lax, students tend to cheat more in those classes. One recent example of using harsh sanctions to discourage cheating occurred at Simon Fraser University in Canada (Gatzemeyer, 2009). Students caught cheating received a final grade of "FD" (that meant failure with dishonesty) on their permanent transcript.

Finally, teachers need to better monitor and control cheating across academic settings. Although teachers seem to have considerable control over cheating in test situations where they can directly observe students, cheating actually occurs there more often than in homework and report writing settings where direct observation is less likely. Therefore, teachers must be vigilant about controlling cheating on tests, especially the casual peeking at someone's answers that 87 percent of students sometimes do. One way to reduce test cheating is to make alternate versions of the test for students seated near each other. This is accomplished by rearranging the order of the questions or answers. Another solution is to create different tests for each class period to prevent students from passing along the test questions or answers outside of class. Better test supervision and test security practices should help too.

To decrease cheating on homework assignments, teachers might take one of two routes. One, they can assign work that requires extended or subjective responses that are less likely copied than brief or objective responses. Two, they can minimize homework's summative contribution to final grades and make it a more formative process. As previously mentioned, cheating is less likely when work is completed to attain mastery (Murdock & Anderman, 2006).

Teachers should also educate themselves regarding the cheating tools available to students who are writing reports, especially more recent and technological tools. For example, there are websites where research papers can be purchased. Teachers should also alert students that they have the means to identify cheating. For example, they could tell students that they can identify a plagiarized paper by typing a sentence into an Internet search engine and immediately locating the copied source. Teachers should let students know that they have access to the same websites and literary notes that students do and will not be fooled by plagiarized work. These and other suggestions for monitoring and controlling cheating appear in an article by McCabe, Treviño, and Butterfield (2001).

The present study, of course, has limitations that future studies might address. Two limitations are most apparent. First, our sample was limited to high school juniors of relatively high academic and economic standing. The homogeneity of students might explain why student factors (GPA and outside activities) had no relationship to cheating. Future research can determine if the cheating perceptions and behaviors chronicled here apply to other types of students as well. Second, although we made some speculations about why students do or do not perceive certain actions as cheating or why they actually cheat, we did not directly investigate these issues. Future research can add a qualitative component that hopefully uncovers the whys behind cheating perceptions and behaviors.

Until such research is conducted, the present study offers these final conclusions for students, teachers, and researchers:

- Cheating is prevalent among high school students across the academic settings of tests, homework, and report writing.
- Students' perceptions of what constitutes cheating are often below ethical standards.
- Even when students perceive a behavior as cheating, they are still likely to do it.

Armed with this information, students, teachers, and researchers should seek ways to link students' cheating perceptions with ethical guidelines and to diminish cheating behaviors across academic tasks.

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Appendix A

Academic Honesty Survey

Please answer all items thoughtfully and honestly. Remember that your responses are anonymous and will be combined and averaged with others' responses.

1. What is your current overall GPA?
2. Roughly how many hours do you spend working at a job each week?
3. Roughly how many hours do you spend participating in extracurricular activities like music, sports, and clubs outside regular school hours?

For each scenario below, answer two questions by circling your choice: 1) Is the described behavior cheating? Yes or No, and 2) Estimate the number of times you have performed this action as a high school student: 0, 1-2, 3-4, 5 or more.

Items 4-8 pertain to test taking.

4. Glancing at someone's answers during the test

   Yes No

   0 1-2 3-4 5 or more

5. Providing answers to someone during the test

   Yes No

   0 1-2 3-4 5 or more

6. Using outside notes during the test

   Yes No

   0 1-2 3-4 5 or more

7. Providing test questions to someone yet to take the test

   Yes No

   0 1-2 3-4 5 or more

8. Providing test answers to someone yet to take the test

   Yes No

   0 1-2 3-4 5 or more

Items 9-13 pertain to homework completion.

9. Doing an individual take-home test with a partner

   Yes No

   0 1-2 3-4 5 or more

10. Copying someone's answers for a take-home test

    Yes No

    0 1-2 3-4 5 or more

11. Copying someone's homework answers

    Yes No

    0 1-2 3-4 5 or more

12. Doing individual homework with a partner

    Yes No

    0 1-2 3-4 5 or more

13. Giving a completed homework assignment to another student

    Yes No

    0 1-2 3-4 5 or more

14. Submitting someone's homework as your own

    Yes No

    0 1-2 3-4 5 or more

Items 15-18 pertain to writing reports.

15. Writing a report based on the movie instead of reading the book

    Yes No

    0 1-2 3-4 5 or more

16. Using outside resources to write a report without reading the book

    Yes No

    0 1-2 3-4 5 or more

17. Using Internet information as your own

    Yes No

    0 1-2 3-4 5 or more

18. Writing a report without crediting others for their ideas

    Yes No

    0 1-2 3-4 5 or more

Appendix B

Table 1

Percentage of students who perceived behaviors to be cheating and percentage of students who performed these actions at least once in high school

Behavior	Perception	Prevalence
Tests		
1. Glancing at someone's answers during the test	89	87
2. Providing answers to someone during the test	94	74
3. Using outside notes	95	54
4. Providing test questions to someone yet to take the test	47	68
5. Providing test answers to someone yet to take the test	84	59
Homework		
6. Doing individual take-home test with a partner	62	51
7. Copying someone's answers for a take-home test	88	45
8. Copying someone's homework answers	75	90
9. Doing individual homework with a partner	23	91
10. Giving a completed assignment to another student	68	60
11. Submitting someone's homework as your own	93	20
Writing Reports		
12. Writing a report based on the movie instead of reading the book	39	53
13. Using outside resources to write a report without reading the book	53	43
14. Using Internet information as your own	83	46
15. Writing a report without crediting others for their ideas	66	34

Understanding the Diminishing Academic Advantage of Full-Day Kindergarten

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Abstract

Most people agree that young children benefit academically from attending kindergarten; however, some research suggests that any academic advantage attributed to attending full-day kindergarten compared to half-day programs will disappear as early as third grade. Based on the results of this study which looked at students in typical classroom settings, a likely explanation for this is that teachers often provide considerable remedial assistance to low achieving students. Once students meet benchmark expectations, instruction tends to broaden to other instructional objectives. We also found that in practice distinguishing between full- and half-day programs based solely on time in school is problematic. Many schools offering full-day kindergarten do not provide a full day of academic instruction, and many teachers see little value of doing so.

Currently kindergarten is mandatory in only14 states, with most states requiring schools to offer only an optional half-day kindergarten program (Education Commission, 2008). However, there is an increasing trend for school districts across the nation to provide young children with a full-day kindergarten option (U.S. Department of Education, National Center for Education Statistics, 2004). Due to federal legislation which requires schools to meet rigorous and rising academic standards, an increasing number of states are considering making fully funded, full-day kindergarten mandatory (Manzo & Robelen, 2003; Plucker & Zapf, 2005; Snell, 2006; West, Denton,, & Germino-Hausken, 2000). As a result, the benefits and challenges of implementing full-day kindergarten programs continue to be popular topics among educators, politicians, and the general public.

Clearly, preparing children for academic achievement is not the only goal of kindergarten (Fratt, 2004). Kindergarten serves several important non-academic purposes; however, many people contend that in an age of accountability the primary purpose of kindergarten is to better prepare students for academic success in later grades. Historically kindergarten was seen as a bridge between the lightly structured world of early childhood and the academic world of a child in formal school situations (Grau, 2006). Logic would suggest that full-day kindergarten programs allow children to spend more time engaged in educational activities; thus a full-day program should better prepare children academically compared to a shorter half-day version (Brewster & Railsback, 2002; Da Costa & Bell, 2000). However, results from studies have been mixed. While some studies suggest that first grade students who attended a full-day kindergarten program test higher academically than peers who attended a half-day program (see Clark, 2001; Da Costa & Bell, 2000; Lee, Burkam, Ready, Honigman, & Meisels, 2006; Stofflet, 1998; Plucker & Zapf, 2005; Viadero, 2008; Walston & West, 2004), other studies have found no difference in achievement (see Brewster & Railsback, 2002; Rathburn & West, 2004; Wolgemuth, Cobb, Winokur, Leech, & Ellerby, 2006). More important, differences in academic achievement that may have existed between full- and half-day students at the beginning of first grade tends to diminish or completely disappear during the early elementary grades (Brewster & Railsback, 2002; Lee, Burkam, Ready, Honigman, & Meisels, 2006; Viadero, 2008; Votruba-Drzal, Li-Grining, & Maldanado-Carreno, 2008). What remains unanswered is why this occurs.

The results presented in this paper summarize the findings of 16 case studies conducted in a variety of elementary schools and school districts in northern Indiana. Each of these studies used a causal-comparative analysis of literacy achievement to determine any long-term advantage full-day kindergarten attendance might have had for students compared to similar students who had attended half-day kindergarten. Each of these studies employed an interpretive analysis of contextual factors that included interviews with the teachers involved. The purpose of this cross case analysis was to categorize and compare literacy achievement outcomes, then use the contextual analysis to better understand the divergent and seemingly contradictory achievement outcomes.

Review of Literature

Clearly there are many factors that affect the degree to which learning occurs in kindergarten. This analysis is focused primarily on the type and quality of the learning opportunities provided in full- and half-day kindergarten. The following review of literature provides a brief explanation of some important aspects regarding the effectiveness of both types of kindergarten programs.

Kindergarten Curriculum Differences

The primary difference between full- and half-day kindergarten is the amount of time teachers have to spend with their students, yet kindergarten classrooms differ significantly in the ways classroom time is used. Not only are there differences in the amount of instruction time available, but the curriculum can vary dramatically from school to school.

Kauerz (2005) suggests that it is not the *quantity* of time spent in kindergarten which makes the difference, but the *quality* of the experience. In the past, some have viewed kindergarten as primarily a child care setting, providing a safe environment for children to interact and develop basic socialization skills. The curriculum of many of these programs centered primarily on play-based activities, focusing more on social interactions than academics. For some time now, however, attempts have been made to link play-based curriculums more explicitly to academic outcomes (Logue, 2007; Neuman & Roskos, 2005). Through the purposeful integration of academics into carefully selected play activities, children are able to learn specific concepts, skills, and abilities. The balance between academics and other important learning objectives is often a fundamental issue. One of the most important decisions policymakers must make is how to establish academic goals and opportunities appropriate for kindergarten without sacrificing non-academic benefits (Strickland, 2006). Indeed, one problem some kindergartens face is the narrow focus academic demands may impose on young children (Kagan & Kauerz, 2006; Katz & McClellan, 1997).

As kindergarten is becoming a much more academic experience, what was once taught in first grade is now part of the kindergarten curriculum. Not only is there is an increased expectation for children to know the alphabet and understand basic mathematical concepts when they enter kindergarten (Concoran-Nielsen & Molson, 1996), kindergarten teachers are expected to prepare their student to meet much more rigorous academic standards (West, Denton, & Germino-Hausken, 2000). For proponents of academic kindergarten programs, the purpose of kindergarten is to prepare students with the prerequisite skills, abilities, and attitudes they will need in order to succeed academically once they start their formal schooling in first grade. In this respect, the role of kindergarten has changed from a semi-structured transitional program to a formal academic preparation program. The development of socialization skills is still important, and the inclusion of play-based activities is an essential part of the learning; however, academic skills, notably the development of early literacy skills, have taken a much more prominent place in the curriculum (Logue, 2007).

Perceived Benefits of Full-Day Kindergarten

In general, students who participate in early childhood programs are believed to be better prepared educationally, emotionally, and socially for future success in the primary grades than those who have not had this opportunity. Various researchers suggest that full-day kindergarten provides educators with several potential benefits (Elicker, 2000; Bronson, 2006). Having students attend kindergarten for a full day affords teachers the opportunity to more fully meet curricular expectations by providing more in-depth coverage of content and giving students more individual attention to guide skill development. A full-day kindergarten program may also allow more opportunity for observation and diagnosis in order to appropriately implement modifications and accommodations. Teachers also expect that full-day kindergarten will enable them to better meet students' individual needs by allowing additional time for developing a more personal relationship with the students and their families (Elicker, 1997).

Yet not everyone believes that full-day kindergarten programs are the answer to the nation's educational problems. Some skeptics believe that the real issue behind the push for full-day kindergarten is not a concern for academics, but rather a desire for childcare. Elkind (2000) suggests that the increased need for childcare in the United States makes full-day kindergarten an attractive option. He also maintains that while the promise of academic benefit is enticing, most children of kindergarten age may not be developmentally ready for a full day of rigorous academic schooling—which is why many childcare programs are, by design, non-academic.

Certainly there are various types of full-day and half-day kindergarten programs. Some offer a rigorous academic curriculum, while others are more oriented toward play-based activities. The basic premise that students will benefit scholastically by spending more time on academic endeavors is fundamental to the argument. Brewster and Railsback (2002), however, believe that it is not the length of the school day that affects academic success; rather it is the quality of the program. Hildebrand (2001) concurs with this theory and goes on to suggest that a student who attends kindergarten—or any environment that supports learning and is rich in experience—will not receive much advantage from attending a full-day program over a half-day program.

Evaluation of Program Benefits

When judging the value of any program or initiative, a variety of criteria might be used. Typically the determination of whether full- or half-day kindergarten is focused on academic advantage is measured by differences in average academic achievement. Assessment of academic achievement is typically based on estimates of learning as measured by standardized tests. Using this criterion, several studies suggest that first grade students who attended a full-day kindergarten program test higher academically than their peers who attended a half-day program (Clark, 2001; Da Costa & Bell, 2000; Lee, Burkam, Ready, Honigman, & Meisels, 2006; Stofflet, 1998; Plucker & Zapf, 2005; Viadero, 2008; Walston & West, 2004). These studies conclude that, based on standardized tests of academic achievement, attending full-day kindergarten provides an academic advantage to students as they enter first grade. However, the evidence supporting such academic advantage is not consistent. Several other studies found no difference in achievement based on attending full- or half-day kindergarten (Brewster & Railsback,

2002; Rathburn & West, 2004; Wolgemuth, Cobb, Winokur, Leech, & Ellerby, 2006). In addition, for many students any advantage in academic achievement that may have existed in first grade between those who attended full- and half-day programs diminish or disappear during the early elementary grades (Brewster & Railsback, 2002; Lee, Burkam, Ready, Honigman, & Meisels, 2006; Viadero, 2008; Votruba-Drzal, Li-Grining, & Maldanado-Carreno, 2008).

Some studies speculated that differences in academic achievement may be caused more by students' socio-economic status than by the length of their kindergarten day. Students attending one program might come from more advantaged households offering more stimulating home environments (Viadero, 2008). Many researchers suggest that the contextual factors of the students and the schools they attend might explain the diminishing advantage (Votruba-Drzal, Li-Grining, & Maldanado-Carreno, 2008).

Factors Affecting Learning and Retention

The teaching and learning process is a complex and dynamic endeavor. The fact that the process deals with human subjects is an important consideration. In fact, researchers cannot always account for the plethora of influential extraneous contextual factors that might affect academic learning outcomes. In practice, many of the extraneous variables that have the potential to affect achievement outcomes are typically not measured, difficult to measure, and often impossible to measure. Some examples include: peer influence, student interest, motivation, health, eye sight, hearing, home life, community life, personality, learning style preference, motivation, effort expenditure, learner intent, academic potential, test anxiety, or the amount of sleep students get (Gay, 1996; Johnson, & Christenson, 2004; Elicker, 2000; Rossi, Freeman, & Lipsey, 1999; Shadish, Cook, & Campbell, 2002). Not only do these factors affect learning, these and other factors also may influence the degree to which students retain information they are expected to learn. When conducting research that looks at the teaching and learning process researchers must rely on the research design to control for or at least attempt to control for contextual factors that might affect specific educational outcomes.

Summary of Literature

There is a general perception that kindergarten is a valuable program for young children as they prepare for formal education. For many the question of whether full- or half- day kindergarten is better comes down to the cliché "if some is good then more is better." Yet several researchers suggest that it is not the quantity of time provided, but the quality of the experience that makes a difference. In terms of the type of experience, kindergarten ranges from simple childcare to play-based curriculum that integrates academics to predominately academic curriculum. When evaluating the merit or worth of full- and half-day kindergarten, several different criteria might be used. Given the current mandate for accountability based on evidence of student achievement, academic advantage as measured by standardized tests is often the primary criterion for evaluating kindergarten programs. While research results are mixed, most studies tend to find that differences in academic achievement that may have existed between full- and half-day students at the beginning of first grade diminish or disappear during the early elementary grades. Explanations for these results remain speculative.

Method

Research Design and Procedures

An explanatory mixed method cross case analysis design was used for this research. This design was selected to account for comparison group differences cause by the inability to randomly assign subjects. The use of multiple cases was used to alleviate the potential for confounding variables affecting the result as much as possible.

The study was conducted in two phases. Phase 1 consisted of an assessment of academic advantage between students who attended full-day and half-day kindergarten. Phase 2 involved a qualitative analysis of contextual factors to better understand and explain the quantitative results.

The first phase of the study was a descriptive comparison of achievement results. Each of the individual cases in this study used a causal comparative analysis of extant student data for various grade levels based on whether the student attended full-day or half-day kindergarten. In each case average group results were analyzed and compared using t-test analysis. This was done to discern any advantage in literacy achievement students might have gained from having attended a full-day kindergarten program. It was also used to determine whether any beneficial difference in first grade continued through subsequent grades. The reader should note that the independent variable in each case was the type of kindergarten program students attended. In causal comparative studies no randomization is possible but any compounding factors that might affect the result between the time of the intervention and the time outcomes are measured (i.e., in later grades) are expected to affect both groups equally.

The second phase of the study employed a qualitative interpretive analysis based on teacher interview data to help explain and better understand the quantitative analysis obtained. Teachers at each school provided information about the type of kindergarten program provided and the way teachers worked with students in various aspects of the program. In most of the studies teachers in later grades were also interviewed.

Data from 16 different schools in 5 different school districts were used in this study. Demographics for the schools varied, but were primarily urban and suburban locations. Several of the schools included large minority groups (i.e., African American and Hispanic), with a variety of socio-economic status (SES) representation (predominantly lower to middle class). In each of the specific cases comparisons were based on actual grouping from each school; thus comparison groups were likely to be similar on at least a few key indicators (e.g., school environment, average socio-

economic status, and neighborhood considerations). Some of the schools included data from small samples of only 15 to 25 students for a specific grade. A few of the schools included larger samples of several hundred students from a variety of classrooms in the school district. This information is displayed in Table 1. The individual cases analyzed in this study used a variety of academic measures to determine literacy achievement. Assessment instruments included the DIBELS reading comprehension test, Northwest Evaluation Association (NWEA) tests for language arts, Iowa Test of Basic Skills (ITBS), Indiana Reading Assessment (IRA), and the Indiana Statewide Test of Educational Progress-Plus (ISTEP+). In each case the school's choice of assessments was considered an acceptable measure of student achievement and an accurate estimate of student literacy. While the tests used and the test administration conditions varied at each site, each of the assessments was conducted by one or more trained educational practitioner as per the requirement of each assessment. Given the often unique contextual circumstances at each school and the different assessment tools used, results were analyzed for each school separately.

Research Limitations

The greatest limitation for any causal comparative study is the inability to randomly assign students to treatment and control groups. Because these groups were preexisting intact groups, the best any researcher might hope for is that the groups employed will be similar, to within a tolerable degree of difference. The research design used in this study attempts to compensate for this problem by looking at multiple cases and when possible to use statistical analysis which attempts to control for differences in the comparison groups that might exist. The consistency in the results tends to give credence to the findings as valid. Still, no research can prove an issue, only provide evidence that the supports or does not support the researcher's assumptions and hypothesis (Johnson & Christensen, 2004).

Another challenge for this study, and in fact all research designs, is the difficulty in generalizing the findings to other settings and circumstances. And while the results of the case studies in this research were consistent, there is no way of knowing for certain that the explanations proposed in this study explain the phenomenon completely for all situations and circumstances.

Results and Discussion

Literacy achievement results varied across these case studies. In general one of two distinct results was obtained: either (1) there was no difference in literacy achievement related to full- and half-day kindergarten attendance, or (2) there was an advantage for one of the groups of students, but the achievement advantage tended to diminish over time. Table 1 presents a summary of the results for each of the cases. The number of students attending each type of kindergarten program is presented, as well as the times at which students' literacy achievement was measured.

Phase 1 Results

Cases 1 and 2 looked at kindergarten only. Both measured achievement at the beginning and end of kindergarten. In these cases preschool attendance was used as an independent variable in addition to participation in a half- or full-day kindergarten program. In both cases students who attended preschool were better prepared academically at the beginning of kindergarten; however, by the end of kindergarten no significant difference in achievement was noted. Thus by the beginning of first grade, it didn't matter which type of kindergarten program students had attended or whether they had had previous experience in a formal preschool setting. On average, all of the students seemed to be equally prepared to enter first grade.

In Cases 3-6 the researchers looked at student literacy achievement at the beginning of first grade and the end of first grade. In two cases students who had attended full-day kindergarten had an academic advantage starting first grade. In all of the cases there was no significant difference in students' achievement by the end of first grade based on whether they had attended full- or half-day kindergarten.

In Cases 7-11 the researchers looked at student literacy achievement at the end of first grade. All cases but one found no difference in achievement at the end of first grade based on attendance in full- or half-day kindergarten. The exception, Case 11, found that students who had attended half-day kindergarten performed better at the end of first grade than students who had attended full-day kindergarten.

In Cases 5, 6, and 9-11 the researchers looked at student literacy achievement in first grade and at the end of third grade. With the exception of Case 11, noted above, students showed no advantage in first grade correlating with attending full-day kindergarten. By the end of third grade, none of the cases found any significant difference in literacy achievement based on their kindergarten attendance.

In Cases 12-16 the researchers looked at student literacy achievement at the end of third grade only. All but one case found no significant difference in achievement at the end of third grade based on attendance in full-day kindergarten. The exception (Case 16) found that students who had attended half-day kindergarten performed better than students who had attended full-day kindergarten. It should be noted that in this case, the school district had a policy of providing full-day kindergarten only to schools with large numbers of students of low socio-economic status (SES). Thus differences in SES may have had more effect on subsequent literacy than differences in the type of kindergarten program students attended.

Phase 2 Results

An important aspect of this study was to better understand why these outcomes occurred. Many possible reasons can be inferred. The explanatory analysis and cross-case comparisons and contextual factors provided insight into possible reasons for these results. Clearly a variety of contextual factors at individual schools would affect the outcomes. The

Table 1
Case Study Details

Case Number	Number of Students (Half day, Full day)	Grade Assessed KG	1st	3rd	Result
1	45 (17,28)	√*			Preschool Attendees better at start of KG No Difference by end KG
2	62 (15,47)	√*			Preschool Attendees better at start of KG Half day better at start of KG No Difference by end KG
3	50 (20, 30)	√	√		Full day better at end of KG No Difference by end 1st grade
4	133 (57,76)	√	√		Full day better at end of KG No Difference by end 1st grade
5	112 (36,76)	√	√	√	No Difference KG or 1st Grade No Difference 3rd Grade
6	34 (15,19)	√	√	√	No Difference KG or 1st Grade. No Difference 3rd Grade
7	30 (15,15)		√		No Difference
8	26 (18,8)		√		No Difference
9	93 (51,42)		√	√	No Difference
10	40 (21,19)		√	√	No Difference
11	29 (22,7)		√	√	Half day better at end 1st Grade No Difference 3rd Grade
12	48 (34,14)			√	No Difference
13	30 (13,17)			√	No Difference
14	55 (19,36)			√	No Difference
15	39 (20, 19)			√	No Difference
16	1083 (291,792)			√	Half day did slightly better (Full day offered primarily to low SES schools)

* preschool attendance was also used as an Independent Variable

following interpretive analysis is based on achievement result analysis supplemented by teacher interview data.

Outcome 1: No difference in achievement. The most prevalent result obtained in these case studies (i.e., 10 cases) was no difference in the academic success of students who had attended full-day and half-day kindergarten programs. While most half-day teachers interviewed suggested they would like to have a full-day program and most full-day teachers preferred the full-day option, their reasons were not based on providing more academic emphasis. In fact, we concluded that not only was there no difference in the achievement results, there was often little difference in the kindergarten programs themselves.

The half-day teachers consistently stated that they focused primarily on academics, many commenting that they had little time for anything else. Many of the full-day kindergarten teachers suggested that their class focused on academics in the morning, or with minor coverage throughout the day, but provided other activities in the afternoon. In other words, a half-day portion of the full-day programs tended to focus on non-academic activities, which might include things like naptime, free play, and other social or enrichment activities. Both programs seemed to be providing a half-day academic program.

Outcome 2: Diminished advantage. In two studies a modest academic advantage at the beginning of first grade was identified which might be attributed to students attending a full-day rather than a half-day kindergarten program. However, analysis of these data suggests that while a quality full-day kindergarten program may benefit students academically at the beginning of first grade, the achievement advantage for students attending a full-day kindergarten program tended to diminish and disappear by middle elementary grades. In most cases any advantage derived from having attended full-day rather than half-day kindergarten disappeared before the end of first grade. Little difference was identified for students past first grade based on their attendance in full-day kindergarten.

Figure 1 presents the comparison of the reading achievement of students in Case 4 for full- and half-day kindergarten students from the beginning of their kindergarten experience through the end of first grade. This result seems to typify those cases in which a full-day kindergarten program did seem to benefit students academically. In this case and in others like it, the advantage of having attended a full-day program tended to diminish by the end of first grade.

One common pattern identified in many of the schools which may help to explain this result is the way primary grade teachers were dealing with different ability groups in their classroom. Referring to accountability demands, teachers consistently noted that they provided different instruction for students in terms of remediation and enrichment based on whether or not they were performing at benchmark levels. Most teachers addressed remediation far more than enrichment. Consensus among respondents indicated that teachers spend significantly more time working with and providing supplemental instruction for students who are not yet at expected levels of achievement compared to students performing at or above grade level expectations. Teachers

emphasized being required to meet the needs of struggling students so that they could pass standardized tests and their school could meet required goals of adequate yearly progress. Thus teachers indicted that they felt it was important and appropriate for them to work with struggling students more than advanced students. Other potentially important factors included the teachers' willingness, training, and ability to provide accelerated instruction for students performing above grade level.

Of particular note specifically in Case 4 is the fact that, while a few individual students may have been struggling, on average students were achieving at or above expectations at each reporting period in the first grade. In this and other cases when students were performing at an adequate level, there was a tendency for teachers to expand the focus of their instruction to other areas. Teachers indicated that once students attained adequate achievement levels in subjects that would be tested through standardized tests, they would broaden the curricular activities rather than continuing to focus only on those aspects of the curriculum that would be tested.

Clearly all schools spent considerable effort in remediation–pull out programs, individual teacher attention, special aides, and other programs with the primary purpose of helping low performing students meet benchmark levels of achievement. Each of the teachers in this study reported some type of remediation effort. However, considering both developmental and motivational factors, many teachers in this study questioned the logic of focusing too much on getting students to perform above expected levels of achievement when there is so much more they could be doing with students in other areas; expanding students' educational experience seemed to be more important than narrowing and focusing their training on a few essential skills.

Benefit of Full-day Kindergarten for At-risk Students

A common practice in many school districts is to provide full-day kindergarten programs only to those perceived to be at risk of academic failure. This may be done at a district level or at a school level. While the method for assigning students to full- and half-day classes varied, Figure 2 presents an example of a somewhat beneficial result for schools that provided full-day kindergarten primarily for at-risk students—Case 2. In this case the school assigned students to full-day or half-day kindergarten based a preliminary assessment of literacy skills. Students who tested low were assigned to a full-day kindergarten class. Each of the other students was assigned to one of three half-day kindergarten classes.

Literacy achievement in this case was measured by a district-wide assessment of knowledge of print concepts, letter and sound recognition, phonemic awareness, and sight word recognition. On average, children with a half-day experience scored significantly higher on the first quarter assessment compared to those with a full-day experience, $F(1,62) = 34.5$, $p < .001$. But by the third quarter assessment, students who were perceived to be at risk based on performance at the beginning of kindergarten were performing as well as the half-day kindergarten students, $F(1, 59) = 0.063$, $p = .802$.

It should be noted that in this particular case study, based on the effect size (ES) calculations, only 17 percent of the variance in scores could be attributed to whether students attended full-day or half-day kindergarten. Almost half (48%) of the variance in third quarter test scores was related to how well students did on the first quarter test. Students who had weaker scores on the pre-test assessment tended to have weaker scores on the post-test assessment. Students who did better on the pre-test assessment continued to do better on the post-test assessment. This result suggests that student ability may have more effect on how well students achieve academically in school than the length of time in the kindergarten classroom. However, providing disadvantaged students with a full-day learning experience did seem to be beneficial to those students.

The general perception among teachers in these studies was that full-day kindergarten would be beneficial for all students, but its primary advantage is to help low achieving students catch up. This perception, however, was not

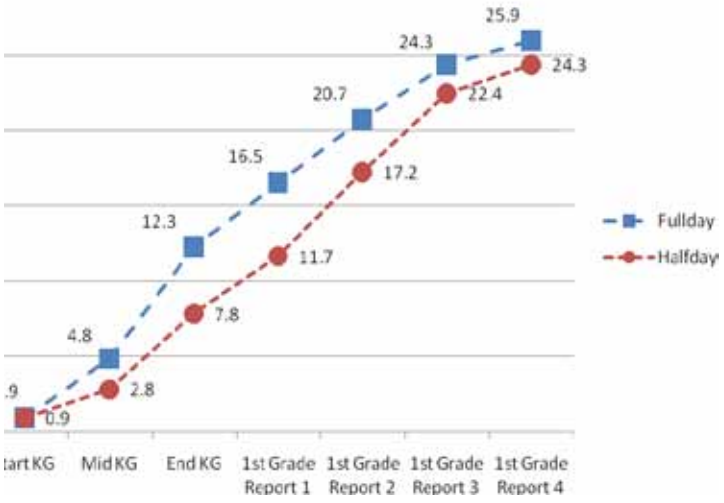

Figure 1. Literacy Comparison Kindergarten through First Grade

supported by the results in every case. In general students seemed to perform poorly on achievement tests and thus be considered to be at risk academically for one of two reasons. Some students fail to achieve because they have not had the opportunity to learn, while others fail to achieve because they have a learning disability or a cognitive delay (Lyon, et.al., 2001; McGill-Franzen, 1987; Slavin, 2009; Woolfolk, 2008). Providing full-day kindergarten seemed to help most in situations where students simply had not had the opportunity to learn. These students were capable, and when placed in a quality learning environment they tended to thrive. However, in severe cases of large-scale poverty or disadvantaged living situations, providing full-day kindergarten did not seem to catch students up to the same degree. Neither would we expect that students with learning disabilities or cognitive delays would catch up to the same degree.

Looking at the issue of providing learning opportunities to capable students, our conclusions seem to be substantiated by Cases 1 and 2, which additionally looked at preschool attendance in conjunction with full- and half-day kindergarten. Students who attended preschool tended to be better prepared at the beginning of kindergarten than those who did not have that opportunity. However, by the end of the kindergarten year no difference in average literacy achievement was evident. In these two cases, students who did not attend preschool prior to starting kindergarten were able to quickly catch up academically with their peers once they were provided the opportunity to learn. This result was the same regardless of whether students attended half-day or full-day kindergarten. Apparently when capable students are given the opportunity they are able to accomplish the learning required of them.

Arguably, even if all students received a similar full-day kindergarten experience there would still be an achievement gap. Given that typical ability and thus performance is normally distributed in the population, if all students received a quality full-day kindergarten experience, some would still to do better than others, and some would perform below average (Linn & Miller, 2005). Clearly, having the opportunity to learn is important, but so is a student's ability. If students are simply not developmentally ready or cognitively capable of doing the work expected of them, mandating an intensive academic experience may not be appropriate. In fact, forcing young children to work for extended periods of time on tasks they find challenging, given their circumstances, may have a detrimental long-term effect in terms of motivation to learn (Kagan & Kauerz, 2006; Keller & Susuki, 1988; Marcon, 2002).

Conclusions

In most cases considered in this study, there did not seem to be any difference between the performance of students attending full-day and half-day kindergarten. An analysis of the information provided in this study suggests that this may have been caused by the fact that many full-day and half-day programs are very similar in the amount of time spent on academic endeavors. Many full-day programs typically spend only half the school day on academic activities. Clearly the quality of the teacher and the learning environment would be factors. Other issues must also be considered. Having students spend more time on academics might seem like a good idea, but there may be many unexpected consequences of forcing students to work on academic tasks they are not developmentally ready to take on, or having them work extensively on tasks they find challenging due to diminished ability in that area. One likely unanticipated consequence of such action might be students developing an intense dislike of school at an early age.

Certainly, there is some evidence from these case studies that a quality academic full-day program may better prepare students academically compared to a half-day program as they enter first grade. Yet any advantage in student achievement attributed to participation in a full-day kindergarten program typically disappeared by the middle elementary grades. Some previous studies speculated that this outcome might be caused by students' socio-economic status. Students who attend half-day programs might come from more advantaged households which offer more stimulating home environments

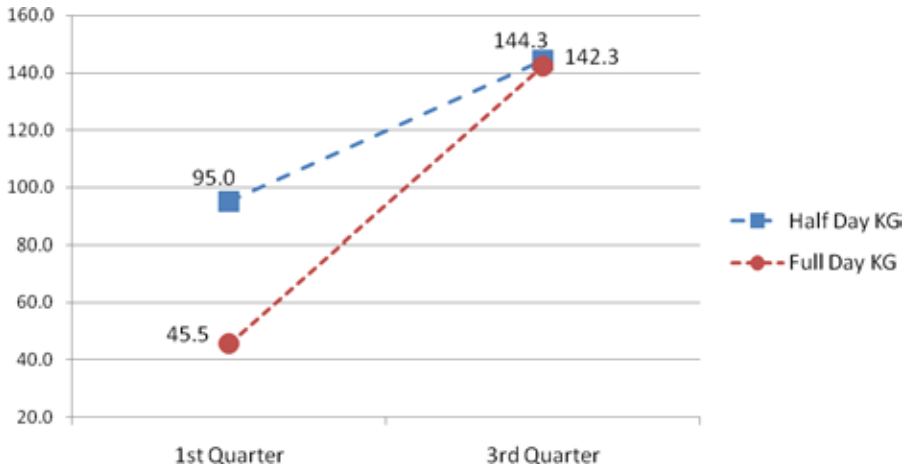

Figure 2. Benefits of Full-day Kindergarten Attendance for At-risk Students

(Viadero, 2008). However, based on an explanatory analysis of qualitative data provided in this study, the most likely explanation for this is the fact that schools tend to spend a lot of time remediating students whose academic performance is less advanced than their peers'. The diminishing advantage in terms of scholastic achievement may result from concentrated efforts by teachers and schools to bring low performing student up to benchmark levels. Several of the teachers in this study indicated that once students reach a certain level of achievement there are many other educationally valuable endeavors they could be pursuing with them. Getting students to perform beyond an established level of expectation does not seem to be important to many teachers.

Additionally, this study found evidence that in some cases providing all-day kindergarten to students at risk for academic failure may have some beneficial effect—particularly for students who are capable of learning but simply have not had the opportunity. Students who have learning disabilities or live in severe socio-economic situations and lack an educationally nurturing home environment may be less likely to benefit significantly from a full-day kindergarten opportunity. Regardless of what educational opportunities highly qualified teachers might provide, other factors must be considered which will adversely affect a child's learning. Even assuming there is a universal and consistent benefit to providing increased academic preschool preparation, providing full-day kindergarten to all students would maintain, not decrease, any existing achievement gap.

Educational research cannot answer the question of whether schools should implement a policy of mandatory full-day kindergarten for all students; however, research should provide educators with useful, valid data from which they can make "data driven decisions" (Johnson & Christensen, 2004). There will always be many political, economic, and social issues to consider (e.g., need for childcare, fewer transitions, or the cost of providing the program). Understanding how various policies and contextual factors influence student achievement is important. In an age of school accountability based on student achievement, there is an increasing expectation that schools must prepare students to succeed academically. In general, the case for full-day kindergarten seems to be driven by a perceived value of the program in terms of increased academic performance. However, providing full-day kindergarten to all children will not fix all the problems and challenges affecting student achievement. Certainly the academic benefits of mandatory full-day kindergarten by themselves do not seem to support such a decision. This does not mean that having full-day kindergarten has no value or should not be undertaken. Such a mandate may be worth pursuing for a variety of reasons. Understanding the possibly reasons for the phenomenon of diminishing academic advantage can only help educational policy makers decide what could and should be done.

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Keeping Native Languages in ESL Class: Accounting for the Role Beliefs Play Toward Mastery

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Abstract

Students' native language is a valuable resource in the English as a Second Language (ESL) classroom. Use of native languages may increase a student's sense of efficacy for learning English by: (a) facilitating vocabulary acquisition, (b) aiding learners in comprehension, (c) encouraging self-regulation, (d) making routines and explanations clear so as to direct attention and free up working memory for tasks in English, (e) modeling communication in environments where students may be reluctant to initiate conversation, and (f) setting the tone in situations where students have come to view English as exceedingly difficult.

An Overview of Native Language Use in ESL Classrooms

English as a second language (ESL) teachers face a dilemma in the classroom—whether to utilize, or even allow, the students' native language. The debate of whether to exclude students' native language (L1) from the target language (TL) classroom has been going on for some time. For some traditional theoretical perspectives on second language acquisition, exclusive TL use is seen positively while any L1 use in the classroom has been viewed in a negative light. For example, from the language transfer perspective (*e.g*., Gass & Selinker, 1983; Odlin, 1989), L1 is less valued as a cognitive tool for TL learning; rather it is treated more often as the culprit for errors made in the TL, typically in error analysis and discussions of negative transfer. Moreover, the theoretical rationale of exposing students to TL inherently justifies the exile of L1 in language classroom. For example, Krashen's hypothesis of comprehensible input pinpoints the crucial role of input for language learning (Gass, 1997; Krashen, 1982). Therefore, by over using L1, teachers reduce the valuable TL input and thus deprive students' learning opportunities with the TL. Some scholars even argue that L1 use may undermine the classroom learning and compromise the quality of target language teaching (Chambers, 1991; Ellis, 1984; MacDonald, 1993). However, in more recent years, this extreme view of L1 has been ameliorated with the reconceptualization of second language acquisition (SLA) (Firth & Wagner, 1997) and an emphasis on the role that the social context plays. In this view, the social context for learning and the positive profiles of the learners are brought to the foreground. Many scholars now argue that L1 is a cognitive tool that can facilitate TL learning (Edstrom, 2006; Macaro, 2001; Swain & Lapkin, 2000). The debate, although changing, does not totally go away.

The renewed debate unfolded with the appearance of two articles in two consecutive issues of the *Modern Language Journal*: Cook (2001) and Turnbull (2001). Cook (2001) summarizes the reasons for the long-standing tradition of rejecting L1 in the language-learning classroom. First is the belief that acquisition of the second or other language should be based on monolingual L1 acquisition. The rationale is that the presence of L1 may interfere with the acquisition of the target language, thus inhibiting students from achieving high levels of proficiency. After all, when acquiring the first language, monolingual L1 learners do not have another language to rely upon; yet they reach native-level proficiency. Such arguments rely on the idea that TL learners should follow the same route. Second, convention dictates that L1 and TL should be kept separate since the former will interfere with the learning of the latter. And third, time spent using L1 will decrease the available engaged learning time in TL. Arguing that the TL acquisition process is different from L1 acquisition and presenting how L1 can be actively and strategically used in TL classroom, Cook advocates the careful and systematic use of L1 in the TL classroom. According to him, maximizing TL input does not exclude the role of L1 in learning and teaching. Cook believes that L1 deserves a place in TL learning. Compared with Cook, who sees the advantages of the use of L1 in TL classroom, Turnbull (2001) is more conservative in embracing L1 use. Although Turnbull agrees with Cook that there is a place for L1 to be used in TL teaching, he strongly warns against the teachers' over reliance on L1, and advocates for maximizing TL use along the traditional line. Discussing SLA theoretical perspectives and empirical evidence, Turnbull highlights some pitfalls of extensive use of L1 and analyzes the disadvantages of such extensive use. Citing his own empirical studies and others, Turnbull testifies the benefit of teachers' use of TL in second- or foreign-language classes. The pitfalls of over using L1 include: a waste of class time, demotivating students, leaving very limited classroom functions to be conducted in TL, etc. Some of these pitfalls were also revealed in other studies (Rolin-Ianziti, & Varshney, 2008). Instead of "licensing" teachers to use L1, Turnbull warns the teachers to "make principled decisions to make judicious use of L1, while maximizing their TL use" (537).

Purpose Statement

Although Cook (2001) and Turnbull (2001) place a different emphasis on the role of L1 in their arguments, we do not see them standing at the two extreme poles. They both note the place of L1 in TL acquisition and both agree on the need for judicious use of L1. This commonality the two theoretical papers share has become our basic position for this paper—that the students' native language plays an important role in acquiring TL. Specifically, the judicious use of L1 in the classroom strengthens students' confidence in their abilities, and in turn, results in higher achievement and higher levels of proficiency in English. We will begin by illustrating how the beliefs students bring to the classroom impacts their learning. We will then examine how self-efficacy beliefs impact achievement. Lastly, we will describe how the use of L1 can result in mastery experiences leading to increases in students' perceived efficacy for learning English.

Self-Efficacy: Believing Is Achieving

One way to better meet the needs of language learners is to better understand them (Díaz-Rico, 2008) and the beliefs they bring to the language-learning environment—specifically, self-efficacy, or the beliefs they have about their ability to achieve a given task. Self-efficacy beliefs have thus far received little attention in the language-learning context though they have been of interest to educators in other domains such as mathematics and science (Zimmerman, 1995). A student who believes s/he is capable of performing a specific task is more likely to make an attempt than a similarly capable peer who casts self-doubts. Self-efficacy beliefs are associated with academic achievement (Zimmerman). Bandura (1995) describes a series of positive actions of individuals who have a high sense of perceived efficacy for a task: set higher aspirations, make stronger commitments to achieving the task, visualize successful outcomes, persevere longer through adversity, etc. These individuals are depicted as more highly motivated, more resilient, less distracted from the task, more relaxed during the task, and more proactive in regulating their learning. As a result, they have higher achievement than those low in self-efficacy. Indeed, a meta-analysis of studies conducted on self-efficacy and academic performance between 1977 and 1988 indicated that self-efficacy accounts for 14% of the variance of students' academic performance (Multon, Brown, & Lent, 1991).

While awareness of the positive outcomes of having a high sense of efficacy may be of interest to researchers, this knowledge is of little benefit unless educators are aware of ways to promote these beliefs. Fortunately, several theorists (e.g., Bandura, 1997; Pajares, 1996; Zimmerman, 1995) have provided direction. Four sources of self-efficacy have been described: (a) mastery experiences, (b) vicarious experiences, (c) social persuasion, and (d) physiological and affective states. Our focus here will be on mastery experiences. Mastery experiences, as their name implies, involve mastery over a task in the domain in question. The individual who succeeds at a particular task, especially if it requires the mobilization of effort, will consequently have an increase in self-efficacy for that task. That is, success will strengthen one's belief in her or his ability to achieve and increase one's motivation to initiate a task (Bandura, 1997).

In summary, self-efficacy beliefs play a significant role in students' academic performance and are informed through four sources—mastery experiences, vicarious experiences, social persuasion, and feedback through physiological and affective states. The way educators structure classrooms can affect self-efficacy beliefs—most notably through mastery experiences.

Increasing Mastery Experiences in the ESL Classroom

Mastery experiences are the most effective way to increase self-efficacy, since they provide the most authentic evidence for self-assessment of task competence (Bandura, 1997). An instructor who prohibits the use of L1 may fail to make the most of these experiences and could possibly even set the student up for failure by not allowing the student to utilize all the resources available to her or him. As noted earlier, use of L1 in English-learning situations has been discouraged based on the assumptions that: (a) TL is best acquired the same way as L1 (i.e. without the support of a previously learned language), (b) L1 will interfere with TL, and (c) time spent in L1 takes away engaged time in TL (Cook, 2001). Cook argues that these assumptions are not based on sound reasoning. That TL should be acquired in the same way as L1 assumes that L1 and TL learners are alike. However, there is generally a gap between the time one learns L1 and TL. This is certainly the case when TL is acquired in a formal educational setting, such as junior high school. In other words, most elementary or junior high students have made advances in cognitive development since the time they were learning their native language (Petitto, Katerelos, Levy, & Tetréault, 2001). That is, junior high students have a greater working memory capacity and a larger knowledge base from which to approach language learning than they did at the time of learning L1 (Cook; Piaget, 2002). Additionally, there is little evidence to support the assertion that L1 will interfere with the acquisition of TL (Petitto, et al.). Lastly, Cook points out that increased TL exposure is best when it is meaningful. It may be more beneficial to devote time in L1 when it enhances the time spent in TL. The maximization of TL can be supported through the use of L1 in a number of ways such as: (a) the conveying of meaning, (b) explanation of grammar, (c) organization of class, and (d) facilitation of collaborative learning and individual strategy use.

Our understanding of reading comprehension further supports the notion of L1 use to encourage mastery experiences. Print exposure has been shown to play a large role in vocabulary growth (Cunningham & Stanovich, 1991). Bruning, Schraw, Norby, and Ronning (2004) point out that

most of the current models of reading share four common features, two of which are relevant to this discussion. First, reading comprehension involves processing at multiple levels. Readers process surface features such as individual word meanings, syntax, and discourse structures. But skilled readers also engage in deeper processing such as making associations between words, converting sentences into propositions, and linking propositions to existing knowledge in long-term memory (LTM) to gain an understanding of the overall meaning of the text. A second tenet of current reading models is that comprehension involves the management of working memory. Working memory involves the active processing of currently attended stimuli coupled with relevant information drawn from LTM. Much of the information in LTM is stored semantically (Bruning, et al.)—presumably, to a large degree in L1. Working memory is limited, and comprehension deteriorates when its capacity is exceeded. L1 use can facilitate understanding of TL text when discussion to link content to prior knowledge occurs before reading. It is important to remember that English-learning classrooms often have a dual focus: content, in addition to language learning (Butzkamm, 1998).

In natural settings, novel words are rarely accompanied by definitions. Instead, readers infer meaning from the morphological and contextual cues embedded within the text. An understanding of the overall meaning of a particular passage can facilitate vocabulary growth—an understanding that can be greatly aided by the use of L1. Teachers can be explicit in showing students how to make the most of these cues. Indeed, in a study conducted by Liu, Ahn, Baek, and Han (2004), it was found that Korean English learners believed that L1 was much more effective in teaching grammar and vocabulary. In their study, students' L1 was found to be used most frequently for explaining difficult vocabulary and grammar, providing textual background information, and highlighting other important information. As their results suggest, it is likely that learners would benefit most from this type of metalinguistic instruction when it occurs in the learners' native language.

Schema theory suggests advantages to a discussion in students' native language of an English passage prior to reading. Schemata are mental structures that guide thought and organize LTM. According to Andre (1987), schemata help to provide a knowledge base for assimilating new information gleaned from text and to guide readers in allocating attention to the relevant parts of passages. Additionally, they allow readers to make inferences about text material, facilitate organized LTM searchers, and summarize content. Conceptually difficult material may require schemata activation through use of L1 with lower- or intermediate-level students.

Several studies illustrate how L1 can be used in a language-learning context to set students up for mastery (e.g., Anton & DiCamilla, 1999; Levine, 2003; Rolin-Ianziti & Brownlie, 2002; Swain & Lapkin, 2000; Woodall, 2002). For example, Antón and DiCamilla (1999) examined the use of L1 through a sociocultural framework. In their model, L1 works as scaffolding within Vygotsky's *zone of proximal development*—the "distance between the actual developmental level…and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Antón and DiCamilla proposed that cognitive development needs an external source as it is initiated through interactions with others. Only later only later do these processes become internal. If interaction with others is vital for cognitive development, then it reasons that use of L1 could be an important element in the ESL class. In Antón and DiCamilla's study, five dyads were audiotaped as they worked together on a writing task. Results indicated that L1 provided scaffolding in a number of ways. It allowed students to engage and maintain one another's interest in the task, develop strategies for making tasks more manageable, and maintain focus on the goals of the task. Additionally, L1 allowed students to discuss the important elements of the task before undertaking them, discuss how to approach specific problems, and build upon one another's partial solutions. Antón and DiCamilla conclude that "to prohibit the use of L1 in the classroom situations… removes, in effect, two powerful tools for learning: the L1 and effective collaboration" (p. 245). They add that this collaboration depends "on students' freedom to deploy this critical psychological tool to meet the demands of the task of learning a second language" (p. 245). In other words, L1 acts as a resource to accomplish the task at hand—mastery of TL. Also adopting a sociocultural framework, Swain and Lapkin's (2000) conducted a study in a French immersion environment. Examining L1 uses made by 22 pairs of eighth-grade French immersion students in collaborative tasks, the study shows how L1 could be used as an important cognitive tool to support L2 learning.

Rolin-Ianziti and Brownlie (2002) studied four instructors' introductory French classes at an Australian university. Data were collected by audio-taping the lessons. The researchers found that intra-sentential translation and language contrast were the most common occasions for using L1. L1 use for strategic translation may enhance input by drawing learners' attention to specific vocabulary items and help vocabulary intake through enhanced repetition. Language contrast, on the other hand, may help learners perceive differences between L1 and TL and thus avoid negative transfer. Therefore, such L1 use may contribute to the mastery of TL.

A study by Woodall (2002) also examined the use of L1 on a writing task in the context of a foreign-language learning setting. Specifically, he sought to observe how L1 use was affected by TL proficiency, task difficulty, and learning group. Results revealed that participants switched to L1 during lexical searches, higher-level operations (e.g., planning and revising), and lower-level operations (e.g., editing, spelling, and transcribing). Woodall stated that more self-regulated students appeared to control their language switching and used their L1 as a tool, whereas less self-regulated learners were not as systematic in their use of L1. With less self-regulated learners, "L1 seemed more like a crutch to obtain cognitive stability" (p. 20). Interestingly, Woodall found that longer

periods of L1 use related to the level of difficulty of the TL texts. That is, the more difficult the texts, the more time spent in L1. To interpret these results from a cognitive framework, it appears that when learners are engaged in a novel task, they may need to resort to L1 to free cognitive resources for the task (Bruner, et al., 2004). To be completely prohibited from doing so may result in a task that is too difficult and leads to failure rather than mastery.

More recently Levine (2003) conducted a study to explore the situation in which L1 and TL use occurred. Participants completed internet-based questionnaires that asked them to estimate the amount of time spent using TL in the classroom. Participants reported that TL generally occurred during activities directly tied to the textbook, while L1 use occurred more during instruction about grammar or usage, as well as during tests and assignment explanations. Additionally, higher levels of TL use were reported more frequently by students who were in their second year of instruction, expected a high grade, expressed greater levels of motivation to learn the TL, and had instructors who encouraged strategies in TL use. These results are consistent with what self-efficacy theory would predict—that students who have a higher sense of perceived efficacy for TL would be more likely to use TL. We also know that these students would have higher expectations and be more motivated to learn TL than students who had a low sense of self-efficacy.

Levine (2003) offers several tenets for language instructors based on these results. First, he notes that L1 serves various functions in the TL classroom and that instructors should not take a hard-line stance in prohibiting its use. Second, Levine advocates that students be given an active role in managing L1 and TL in the classroom.

In summary, allowing the use of L1 in the classroom can aid in the acquisition of the TL in the following ways: (a) helping student prime the appropriate vocabulary set prior to engagement with a particular passage, (b) explanation of particularly complex grammar points, (c) organization of the learning objectives, and (d) the facilitation of collaborative learning and individual strategy use.

Implications

These studies illustrate the variety of ways that use of L1 can help support the learning of TL. The four themes where L1 contributes to mastery are: (a) facilitating vocabulary acquisition, (b) aiding learners in comprehension, (c) encouraging self-regulation, and (d) making routines and explanations clear so as to direct attention and free up working memory for tasks in TL. As noted, print exposure leads to vocabulary growth (Cunningham & Stanovich, 1991), and vocabulary acquisition often relies on the cues provided by the text (Bruning et al., 2004)—cues often supplied by the meaning of the passage. It reasons that native-language discussion of the meaning prior to the reading of the passage would assist students in an understanding of novel words they encounter. This is especially true when the overall meaning of the passage is relatively more abstract or difficult.

In the same way, discussion of the passage can aid students in comprehension of the meaning of the text. Learners are more likely to revert to L1 as the difficulty of the TL passage increases (Woodall, 2002). If an English passage is difficult, the cognitive load may reduce reading to mere translation and code breaking, with the meaning of the current sentence failing to be retained as the reader proceeds to the next sentence. Difficult passages especially may require schema activation through L1. An understanding of the passage allows the reader to draw connections between the "micro-meaning" of a particular sentence and the larger "macro-meaning" of the passage in general.

Use of L1 in English class can encourage students to be better self-regulated. This can happen in two ways: (a) by facilitating communication between peers, and (b) by expressing their own thinking on how to approach a task. As Antón and DiCamilla (1999) pointed out, students can encourage one another to be better self-regulated. This occurs when L1 allows students to encourage each other, and engage and maintain one another's interest in the particular task. Students who are permitted to communicate in L1 about the task at hand can help one another develop strategies for completing the task or making it more manageable. Students can guide one another in keeping the goals of the task at the forefront and build upon the work of their peers. Additionally, as noted, students often revert to L1 when a difficult TL task is encountered (Woodall, 2002). Allowing students to express their thoughts during the task may help them to process the strategies they are utilizing and encourage metalinguistic awareness and analysis.

Lastly, L1 use is appropriate in making explanations of assignments and activities clear. A student who is using all of her or his available cognitive resources to understand the method of the assignment may not have the capacity to also address the purpose of the assignment. In other words, a student who fully comprehends the expectations is free to focus on the task at hand.

Use of L1 in the ESL class can do more than promote mastery experiences for increasing a student's sense of efficacy for learning English. Use of L1 by the ESL instructor can also provide vicarious experiences (Bandura, 1997). That is, it provides students with a real-life example of foreign-language use as a means of communication. This may be especially important in environments where students are reluctant to initiate conversation until they have formed grammatically correct sentences. Additionally, social persuasion (Bandura) and encouragement from the ESL instructor may be more meaningful to students when it comes in their native language. A word of praise in the students' native language may have more of an impact if there is no need for students to disengage from the task they were apparently performing

successfully to de-code a bit of English they had not been exposed to before. Finally, use of L1 by the ESL instructor could influence physiological and affective states (Bandura) by decreasing anxiety. This may be especially important in setting the tone on the first day of class in front of a room of students who have come to view English as beyond their ability.

Although most of our discussion is centered on the benefits of native language in increasing mastery experiences in ESL class, we should note that the implications of L1 use in English-learning environments are extensive and well worth exploring.

Directions for Future Research

We have several recommendations for future research. First, more empirical research is needed in order to continue the investigation of whether the judicious use of L1 increases the mastery experiences in the ESL classroom. Second, a set of concrete and theoretically sound guidelines for L1 use is called for. As Edstrom (2006) argues, "the appropriate quantity of L1 use by teachers cannot be defined universally, as a fixed percentage" (289). Future research may contribute to the creation of such guidelines. And lastly, future studies should continue to probe the teachers—as well as the learners—beliefs of and attitudes towards L1 use in mastery experiences, given the dearth of this type of research. Actual classroom observation data will add strength to such research.

Conclusion

This paper has advocated for the use of L1 as a valuable resource in moving students toward mastery of English in an ESL environment—specifically, in that use of L1 can facilitate vocabulary acquisition, aid in TL reading comprehension, encourage self-regulation, make task assignments clear, and promote an environment conducive to learning. However, in closing, we want to re-emphasize that we are not proposing that use of L1 should be encouraged in situations which do not support the mastery of English. That is, we agree with Turnbull (2001) that casual, extensive use of L1 may do more harm than good. L1 should not be used as a crutch; use of English should be maximized whenever possible. Clearly, if learners have the ability to comprehend task instructions or the meaning of more abstract passages, then schema activation in L1 may not be necessary. Additionally, more advanced learners who have the ability to communicate their thoughts in English about which strategies to utilize in their approach to a particular learning task should be encouraged to do so in English. The idea behind self-efficacy theory is that students come to believe they are capable of English mastery. Over-reliance on L1 does no more to encourage these competency beliefs than barring its use—and setting students up for failure. We thus argue for judicious, systematic, and strategic use of L1 in ESL classes to structure classrooms in such a way as to maximize students' mastery experiences with the target language.

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Dr. James H. McMillan

Dr. James H. McMillan is Professor and Department Chair of the Department of Foundations of Education at Virginia Commonwealth University, and Director of the Metropolitan Educational Research Consortium (MERC). MERC is a 20 year partnership between eight Richmond area public school divisions and Virginia Commonwealth University that conducts applied research and evaluation projects. Dr. McMillan is also Track Coordinator for the Research and Evaluation Track of the Ph.D. in education. He obtained his masters degree from Michigan State University in 1972 and his doctorate from Northwestern University in 1976. Dr. McMillan has published several editions of three research methods textbooks and two assessment textbooks, in addition to over 60 journal articles, and has made numerous national and state presentations. He has chaired the AERA Classroom Assessment and Professors of Educational Research Special Interest Groups. His current research interests include classroom assessment, benchmark testing, and the impact of high-stakes testing on schools and students.

Friday Luncheon Keynote Address

Featured Speaker

Dr. Michael J. Feuer

Dr. Michael J. Feuer is the executive director of the Division of Behavioral and Social Sciences and Education at the National Research Council (NRC) of the National Academies. He has been at the NRC since 1993, first as the director of the Board on Testing and Assessment and then as the founding director of the Center for Education. Prior to joining the NRC Feuer was senior analyst and project director at the Office of Technology Assessment of the United States Congress. He received a BA in English literature from Queens College of the City University of New York, an MA in public management from the Wharton School, and the PhD in public policy analysis from the University of Pennsylvania. Dr. Feuer has lived in Israel and France, and studied at the Hebrew University and the Sorbonne. Upon completing his doctorate he taught graduate seminars at Penn and then joined the faculty of Drexel University, where he taught courses in organization theory, labor economics, and public policy. He has published in numerous academic journals on human capital theory, manpower planning, psychological testing, philosophy of education policy and research, and democratic education; and he has had many reviews in newspapers and magazines in Washington, Philadelphia, and New York. His current special interests are evidentiary standards in education research and theories of rationality applied to education policy and education research. Dr. Feuer's most recent book is *Moderating the Debate: Rationality and the Promise of American Education*, published by Harvard Education Press in 2006.

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Interdisciplinary Curricular Conversations Examining Arts and Academics: Teacher Implementation and Student Outcomes

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Abstract

This qualitative study examined the integration of arts and academic curricula at a performing arts school by focusing on the curriculum as it is understood and perceived by the students. The study centered on five students at a performing arts magnet school who were chosen based upon contrasts in their arts classes in order to represent a range of participation in the various performing arts. Findings indicated that students were unable to recognize the integration of arts in the teaching materials, strategies, and interaction in academic courses. Results also indicated that the more teacher-centered instructional materials and pedagogical strategies utilized in the arts courses, although less cohesive to the students, allowed the students to perceive the integration of more academic activities and behaviors in those art classes. The authors argue that the students' familiarity with scholastic behaviors, understood by students as "doing school," impacted the students' capacity to perceive the cohesiveness of the academic curricula and recognize the integration of these behaviors and activities in the arts courses.

The mission of the Midwestern Arts Academy (pseudonym) is to "connect the arts, humanities, and sciences to today's real world success." In stating such a mission, this urban school in a mid-size city hoped to contribute to what Seidel and Castaneda-Emanaker (2006) called the promise of aesthetic education:

> The arts can transform education not because they 'reach' [an urban] student and assimilate him or her into the majority culture, but because they *connect* a student (and adults) to the knowledge and traditions of the larger community in a way that also encourages participation and expression of individual voice. (p. 146)

Consequently, such a mission placed the school within the tradition of curricular integration, although on an admittedly grand scale.

Through an exploration of student perceptions, this study examined the integration of arts and academic curricula at a performing arts school in which many of the students are artistically gifted. In previous classroom research on integrating curriculum, we found that distinct content area subjects did not necessarily mesh easily in the planning and enacting of integrated, or interdisciplinary, curriculum (Applebee, Burroughs, & Cruz, 2000). What would we find when an entire *school* attempted the integration of arts and academics? Would students recognize such integration in the specific classes? Would the interdisciplinary curriculum reflect a cohesive curricular conversation within the classroom context?

Literature Review

Integration of curriculum, or interdisciplinary curriculum, has a long tradition, stretching back at least to the Progressive Era (Dewey, 1913). Dewey placed great value on considering the ways in which curricula could be unified, both in terms of establishing relationships among its seemingly disparate disciplines, as well as connecting schools to the wider society in which they existed. Like Dewey, many advocates of interdisciplinary curricula have stressed the ability of integrated curriculum to address research and practical problems in ways that are not bounded by traditional content areas and disciplines (Adler & Flihan, 1997). Moreover, advocates have argued that integrated curriculum can have a positive effect on teacher working conditions, as planning for integrated curriculum often brings teachers of disparate disciplines together (Kain, 1996). Finally, advocates have often argued that integrated curriculum can make education and schooling more relevant to students' lives and experiences (Hargreaves & Moore, 2000) by giving direction to educational activities and helping students understand more clearly what their efforts in learning are about (Dewey, 1916, p. 119).

Although there have been many theoretical books, articles, and reports advocating the advantages of integrating curriculum, the empirical research literature on the topic is not large (Czerniak, Weber, Sandman & Ahern, 1999; Ellis & Fouts, 2001; Vars, 1996). For example, Vars argued that "more than 100 studies" have shown that interdisciplinary curricula offer students a program at least as effective as con-

ventional programs. Vars' review of the research, however, offers primarily a synthesis of findings, rather than a critical examination of the empirical studies, and some researchers advise caution (Ellis & Fouts). When reviewing research concerning integration of math and science curricula, for example, Czerniak et al. noted that "there is little existing empirical research supporting the notion that it is more effective than traditional, discipline-based curriculum" (p. 422). Reviewing interdisciplinary research in which music is correlated with other disciplines, Ellis and Fouts concluded that "it is difficult to find strong empirical evidence that the integration of music instruction with other content areas produces more positive results than does a traditional approach" (p. 22).

What empirical research exists tends to focus on the teacher and the individual classroom as the unit of analysis (Adler & Flihan, 1997). As such, the research focuses primarily on the planned and sometimes the enacted curriculum, i.e., the curriculum as developed and implemented by the educator, rather than the effects of curriculum on students (cf. Hargreaves & Moore, 2000).

Burroughs and Smagorinsky (2009) assert that there is a shortage of studies that investigate the effects of curricular organization and how students perceive those effects. These authors assert that, without empirical research that documents the outcomes of various curricular contents and configurations, arguments about the effectiveness of particular curricular designs, including interdisciplinary curricula, will remain primarily theoretical and unsubstantiated. One potential reason for the lack of empirical studies that consider the effects of curricular organization, specifically students' reception and understanding of the curriculum, is that the complexities of implementing an interdisciplinary curriculum can present significant problems. Researchers, for example, have found that in implementing an interdisciplinary curriculum, disciplinary knowledge may clash (Applebee, Burroughs, & Cruz 2000; Weinberg & Grossman, 2000). For example, Weinberg and Grossman (2000) studied the integration of a high school English and history program. Over the two and a half years of the collaboration, researchers concluded that conflicts arose at a deep level of disciplinary differences.

Determining how interdisciplinary curriculum is implemented is a crucial aspect of determining how students receive such a curriculum (Applebee, Burroughs, & Stevens, 2000). The implicit disciplinary traditions that teachers draw upon in constructing curricula are central to how students receive instruction. Being explicit about the curricular decisions—whether it is the criteria for text selection or organization of content—can guide students to make relevant connections (Burroughs, 1999). By examining the "conversational domains" supported by the curricula, we can discover to what extent one discipline is used to support or enrich another (Applebee, Burroughs, & Cruz, 2000). In the case of the present study, we sought to discover the impact of art and academic integration on students' perception of curricular cohesiveness. Specifically, we looked at the ways in which disciplinary activities and behaviors were incorporated in the classroom contexts, and then considered if, how, and to what degree the students perceived integration of arts and academics in their performing arts magnet school.

Curricular Conversations

In teacher education programs, pre-service teachers are often taught curricular planning with a part-to-whole approach. For example, education students are taught to create a single lesson plan, then multiple lesson plans, and finally a unit plan. Rarely do they learn to construct or examine long-term curriculum maps. This is due, at least in part, to the fact that curriculum is often defined as a course of study or a program of learning that ultimately leads to a certificate or degree. It is also a result of the fact that curriculum, so defined, appears to be organized and dictated by administrators and policy-makers, and not determined by the educators themselves. This narrow definition of curriculum, however, does not highlight the decision-making power of the educator in the planning and implementation of the course of study (Applebee, 1996).

Additionally, the notion of what exactly constitutes a curriculum and what its purpose might be varies. In curriculum theory, for example, Schiro (2008) describes four types of curricular ideology, each with its own strengths and limitations: Scholar Academic, Social Efficiency, Learner-Centered, and Social Reconstruction. The purpose of the education from the Scholar Academic perspective is to help children learn the accumulated knowledge of our culture, where understanding involves learning its content, conceptual frameworks, and ways of thinking. For the Social Efficiency Ideologue, the purpose of schooling is to efficiently meet the needs of society by training youth in skills and procedures needed for the workplace. In that case, the essence of learners lies in their competencies and activities they are capable of performing. With a focus on the needs and concerns of the individual, the Learner Centered teacher believes that real growth occurs as students construct meaning by interacting with their physical, intellectual and social environments, and the result of learning (the construction of meaning) is unique to the individual. Lastly, the purpose of education for the Social Reconstruction Ideologue is to facilitate the construction of a more just society that offers maximum satisfaction to all members; education is a social process through which society is reconstructed. Additionally, Schiro (2008) asserts that student beliefs as well as content areas can influence the classroom, and teachers can position themselves in more than one ideology. Clearly, this is just one conception of curriculum.

While there are multiple ways of conceiving of curriculum, we chose to utilize the conception of curriculum as conversation for this study. Curriculum, as we use it here, is the sense of purpose and direction that is established by teachers around which all texts, classroom discussions, and pedagogical activities are centered (Applebee, 1994, 2002).

In utilizing a curriculum so defined, we were able to consider curriculum as it exists at three levels: the planned, the enacted, and the received. The *planned curriculum* includes the materials and texts that are chosen, along with the methods and activities selected by the teacher intended for classroom instruction (Applebee, 1996). The *enacted curriculum* is the planned curriculum as it is implemented—the utilization of materials, texts, methods, and activities in the classroom as it occurs and unfolds. Because teachers may capitalize on teachable moments or find that lesson plans may not work the planned curriculum is not an infallible predictor of what is actually enacted. Lastly, *the received curriculum* centers on the students' perception and understanding of the enacted curriculum. What the student actually perceives as occurring in the classroom may or may not be consistent with either the planned or enacted curricula.

In addition to highlighting the levels of curricula, utilizing Applebee's (1996) theory of "curriculum as conversation" as a theoretical basis provided a way to inform our data collection across multiple classrooms of both artistic and academic content. Applebee (1996) argued that conceiving of curriculum as "domains for culturally significant conversations" can provide a way of conceiving curriculum that is more consistent with the constructivist pedagogy that has been the focus of much research on instruction over the past two decades:[1]

> Through such conversations, students will be helped to enter *culturally significant traditions of knowledge-in-action.* In most schools, these traditions will reflect major academic disciplines—language, history, literature, science, the arts—though they can just as easily be interdisciplinary or cross-disciplinary, or be based on traditions of the home, community, or workplace. (p. 37, emphasis added)

Such a notion of curriculum takes as its starting point that curriculum involves more than just what is learned, but how it is learned as well. Classroom constructs themselves, along with the pedagogical practices that are implemented within them, define what are acceptable or unacceptable ways of knowing and doing (Gallas & Smagorinsky, 2002). Applebee (1994) has stated that successful teachers are effective because they "have a sense of where they are going and why, and they create within their classrooms a sense of coherence and direction that students recognize" (p. 46). By entering into culturally significant conversations (Applebee, 1996), students are entering into traditions of discourse that implicitly represent various ways of knowing and doing. That is, knowledge is not only knowing *what*, but also knowing *how*.

It is these "ways of knowing, thinking, and doing" that form the boundaries of disciplines, as well as the criteria for legitimate participation in the discipline. What are acceptable topics, reliable methods of inquiry, compelling evidence, or persuasive modes of argument are all examples of features that define aspects of disciplinary knowledge (Bazerman, 1994a; Herrington, 1985; Langer, 1992). Educators in their respective disciplines, guide students in meaningful conversations and implement engaging activities that are supported by an appropriate amount of quality materials.

A curriculum in which students are drawn into the domains of culturally significant conversation is inherently "lively" and engaging, and such instruction creates spaces for students to explore, investigate and consider all manner of interpretive possibility (Applebee, 1997). Although traditions of discourse within disciplines change and evolve, what one often learns in school are often the codified notions of disciplinary traditions. Consequently, in contrast to Applebee's (1996) notion of a curriculum of "knowledge-in-action" that encourages students to enter into current conversations within living traditions of discourse, many curricula present "knowledge-out-of-context" for students to learn *about* disembodied content. A decontextualized curriculum "may enable students to do well on multiple choice items…[but] it does not enable them to enter on their own into our vital academic traditions of knowing and doing" (Applebee, 1996, p. 33). The content in such a curriculum does not encourage or induce student participation or appeal to the development of further conversation because it is "dead as well as deadly, certain to bring the curricular conversation to a halt rather than leading it forward" (Applebee, 1994, p. 47).

In the teaching of literature, for example, Williams (1961) has shown how the lived culture of an historical record gets distilled into a "selected tradition." These selected traditions often become "deadly" traditions, as students are marched through a list of classic texts, focusing on "right" answers, with few explicit reasons for why the texts were chosen or what connections there might be among them. Such deadly traditions often express themselves in classrooms through highly codified classroom discourse and rigid genres (Marshall, Smagorinsky, & Smith, 1995; Mehan, 1979) that students often recognize as "doing school."

When various disciplines meet in interdisciplinary curricula, traditions may conflict in their ways of knowing (Applebee, Burroughs & Cruz, 2000; Weinberg & Grossman, 2000). In a typical correlated curriculum in which subject matters are paired—as in a secondary course pairing American literature and American history—one discipline often dominates the approach. For example, a correlated literature and history course may use historical ways of knowing as the basis for the curricular conversation. In such a conversation, the literature read and discussed is used to address historical topics and issues. For example, *Huck Finn* might be approached as an historical artifact, an illustration of historical attitudes toward slavery rather than as a literary artifact (Weinberg & Grossman, 2000). Similarly,

1 Applebee is working in a tradition of seeing education as an entering into cultural and disciplinary conversations. See also (Burke, 1941, pp. 110-111) and (Graff, 1992, p. 77). For a conception of "instruction as conversation" see (Yinger, 1990). While Burke and Graff use "conversation" as a passing metaphor for instruction and curriculum, Applebee has sought to create a theory of curriculum, drawing upon the theoretical work of language philosopher H.P. Grice {, 1975 #102}.

when school disciplines meet in interdisciplinary designs, they may conflict in their degrees of "liveliness" as well. A social studies and language arts curriculum, for example, might conflict in its approach to primary sources such that students are actively interpreting documents in pursuing open questions in social studies, while answering more predictable questions concerning the literature they are reading. As we approached an integrated arts and academic curriculum, we were interested in identifying and understanding the ways in which the teachers attempted to amalgamate content area subjects in an interdisciplinary curriculum. We considered this integration by looking at the students' perception and understanding of the curricular conversation.

Methods

This research project took place in an urban performing arts magnet school. It employed naturalistic inquiry (Patton, 2002) in which the setting was observed in its natural state; neither the setting nor the outcomes were manipulated or constrained in any way. The participants, a small sample of students who represented a wide range of artistic majors, were a direct source of data. We focused on students as our unit of analysis because so few studies of integrated curriculum have analyzed or emphasized student outcomes within integrated curricula (Lake, 1994; Morrow, Pressley, Smith, & Smith, 1995; Vars, 1996). Specifically, we used an observation and interview method of qualitative research in order to capture the students' personal perspectives and experiences regarding their understanding of the curricular conversations in arts and academic classes and how these conversations were integrated into their classroom activities and understandings.

Context

In 1973, the performing arts school was established as one of five magnate schools in a Midwestern urban school district. With approximately 150 students in grades four, five, and six, the school shared space with an elementary school. In 1976, after a year spent in a temporary space outside of the city, the performing arts school moved into an historic 1906 building that it occupied downtown. The numbers of students continued to grow, and in 1979, the first class of seniors graduated.

All students auditioned for a place in the school. The performing arts school attracted students from within the urban school district in which it was located, as well as nationally and internationally. The school was free to students who resided in the public school district, while tuition was accepted from students outside the district. More than 90 percent of graduating seniors continued on to colleges and universities each year. The school offered a full college-preparatory curriculum for grades 4 through 12, which included challenging work in language arts, foreign language, mathematics, science, and social studies. Moreover, it provided a comprehensive study in the arts, including creative writing, dance, drama, instrumental music, technical theater, visual arts, and vocal music, preparing students to professionally pursue their arts majors. The school boasted a regularly high academic ranking where students consistently scored above the average on national achievement tests. The school was dedicated to providing an environment that facilitated the development of each student's artistic and academic potential.

Participant Selection

Participants were recruited through an academic class, with the help of teacher recommendations. Specifically, fifth grade students were recruited by the research team through their science class; eleventh grade students through their English class. Because the study focused on students' perceptions of arts and academics integration, we searched for students who were perceived by their teachers as well motivated in arts classes. Consent from parents for student participants and assent from students were obtained through signed consent/assent forms. Confidentiality of participants was preserved through the use of initials or pseudonyms throughout the study.

Originally, 16 students agreed to participate in the study. After conducting initial interviews, we narrowed participants down to six because of scheduling conflicts in classes, demands on students in their performances, and difficulties in scheduling interviews. While we attempted to focus on students who were the most articulate and appeared able and willing to provide most data, our primary concern was diversity in arts classes. While there was an attempt to allow for equal representation of grade levels, gender, and race, the students were chosen based upon contrasts in their arts classes; that is, students were meant to represent a wide range of participation in the various visual and performing arts classes offered at the school. Due to scheduling problems and illness, complete data was collected on only five of the six chosen participants. A complete table of the attributes of willing participants can be found in Appendix A.

Data Collection

Data included student interviews, classroom observations, and an analysis of classroom artifacts. The sources included the student participants, and through observations of classroom conversations, activities, and interactions.

Because this study was concerned with two of the three aspects of curricular organization (Applebee, 1996)—the enacted and the received—classroom observations during instruction in both the arts and academic classes were both appropriate and necessary. The research team conducted overt observations of classroom instruction in order to gather data on the curriculum enacted in every course in which each of the five students were enrolled. These observations entailed a holistic focus that included the topics and content of curricular conversations, the activities in which students engaged, the types of assignments that were given, the explicit (or implicit) interdisciplinary links suggested by the topics, the teacher, or the activities, and, finally, student engagement in classroom activities. Observations of students in academic and arts classes were recorded in field notes (see Appendix B).

Additionally, student participants were interviewed and tape recorded twice during the academic year. Open-ended semi-structured interviews focused on how students made sense of the curriculum; the coherence they perceived in the curriculum; the integration they perceived of the arts and academic curricula; and discussion of classroom artifacts like tests or arts events such as recitals (Appendix C). The main objective of these interviews was to find out things not easily observable in the classroom. Internal facets of the participants, such as thoughts, feelings, and intentions were sought through a general interview guide approach (Patton, 2002).

Finally, student artifacts, such as written assignments, tests, homework, papers, and visual depictions were analyzed for evidence of cross-curricular connections. Copies were made of the student artifacts; originals were returned to the students.

Data Analysis

Patton (2002) indicated that the "fluid and emergent nature" of naturalistic inquiry makes the line between data gathering and data analysis "far less absolute" (p. 436). Even while in the field, ideas about the direction of analysis, the emergence of patterns, and the surfacing of themes occurred. Furthermore, naturalistic inquiry required a holistic perspective, such that the complex system of curricular conversation was viewed as more than the sum of its individual parts. Thus, all of the data gathered from this study were analyzed with the ultimate goal of discerning patterns and variations within and across sources.

Data from the student interviews and observational field notes were initially analyzed using analytic induction, a process by which initial coding categories were discerned from patterns within transcripts and field notes (Bogdan & Biklen, 2003; Strauss & Corbin, 1990). Multiple readings of the data sources and regular meetings of the researchers helped complete this first phase of data analysis. Based on the three data sources, two discrete categories emerged. On one hand, there was "traditional" teaching that consisted primarily of teacher-centered discourse, paper-and-pencil textbook tasks, memorization, and questioning that elicited "correct" student responses (i.e., answers consistent with what the teacher wanted). On the other hand existed the less traditional instruction that included student-driven classroom conversation, classroom discourse that did not utilize typical classroom protocol (e.g., turn-taking and hand-raising), fluid collaboration between and among students and teacher, performance-oriented tasks, and open-ended questioning.

Student interviews were also analyzed using Grice's conversational maxim of relevance, which was used to classify the classroom curricular conversations. Applebee (1996) utilized this axiom to derive the five curricular organizations of continuity and coherence (Applebee, Burroughs & Stevens, 2000). Specifically, researchers categorized the curricular structures (Applebee, 1996) as catalog, collection, sequential, episodic, or integrated.

On one end of the continuum are *catalog* curricula. Some curricula are organized with no explicit topic or domain of conversation, and simply log or list experiences or activities. An English course designed in this manner might, for example, might include a variety of texts that are disparate and have no thematic connection to one another. Such curricula is completely lacking in continuity or coherence. A second type of curricular organization is a *collection*, where texts and activities are grouped as a "set" and taught separately, without an overriding premise to connect them. A biology course planned in such a way might present instruction around the different body systems, each of which are explored separately before progressing to the next. *Sequential* curricula have an internal organization based on chronology. These courses result in a well-structured scope that covers a wide breadth of material, but, like the collection, result in little support for connections between and among the individual parts. Many literature courses are developed in such a way, allowing teachers and students to sample text from different time periods, but in such a way that there is no relationship among them, other than the fact that texts are all part of the survey course.

When a stronger purpose or theme is added to a sequential curriculum, the curricular structure moves toward the other end of the continuum and becomes *episodic*. If, for example, the survey of literature course above adds a governing principle, such as the impact of an author's life on his work, it presents an opportunity for larger conversational domains to develop, in addition to allowing the students to return to and deepen their understanding of the organizing principle. Episodic curricula, however, are limited in that, while the conversations may elucidate the organizing principle, they do not illuminate one another. When students are afforded a chance to discover the interrelationships across all of the content "so that parallel but independent discussions of an episodic curriculum begin to echo back on one another" (Applebee, 1996, p. 77), an *integrated* curriculum has been achieved. As new information and elements enter the conversational domain, students have opportunity to revisit and reconstruct their understanding old material and skills, as well as develop new proficiencies and explore new content. Thus, curricular conversations observed in this study were analyzed in order to determine their level of coherence and continuity.

Trustworthiness

Trustworthiness is the parallel term for rigor in traditional social science and is essential to assuring readers that the research is worthy of attention (Lincoln & Guba, 1985). A valid inquiry, conducted through qualitative analyses, addresses for areas: credibility, transferability, dependability, and confirmability.

The credibility of qualitative analysis is dependent on rigorous methods and the credibility of the researcher (Patton, 2002). It is, essentially, the extent to which the representations of the study reflect the student participants' realities.

This was accomplished, first and foremost, by achieving triangulation during data collection. The variety of sources (interviews, observations, and student artifacts) assured that the data was diverse and allowed the researchers to elicit differing constructions of reality and a range of perspectives.

Because this study was rooted in a qualitative paradigm, generalizability of findings would not be considered (Lincoln & Guba, 1985). Instead, researchers looked at the specific contexts in which events occurred in order that those considering the results of this study would be able to make judgments concerning applicability in other contexts. This was accomplished by collecting detailed descriptions and direct quotations of participants in order to capture and reflect the participants' personal perspectives and experiences. Furthermore, through purposeful sampling (Patton, 2002), the researchers sought to maximize the information that could be obtained from the study's participants and context.

Moreover, there can be no credibility without dependability (Lincoln & Guba, 1985). Dependability is a methodical process that is systematically followed (Patton, 2002). First, all participants were recruited in person with the same recruitment script. Next, we followed the same field note collection too and interview protocol with every participant. Since all participants were asked the same questions in the same order, this increased comparability of responses. Lastly, during the final interview, all participants were asked to engage in reflection (Lincoln & Guba, 1985).

Authenticity pertains to the researcher's reflexivity, appreciation of multiple perspectives, and fairness in depicting constructions in values that support them (Patton, 2002). The research team achieved this by dialoguing about the data collection and analysis during monthly meetings. Additionally, direct quotations taken from the participants' interview transcripts assured authenticity during the reporting of findings.

Findings

Although the mission of the urban performing arts magnate school at which this research occurred was the integration of arts and academics, our findings showed that this was not the case. For example, the organization of the faculty did not reflect integration. Two separate faculty meetings were regularly scheduled, one for the arts faculty and one for the teachers of academic courses. Moreover, the class schedule also reflected that division; students clearly understood when they were attending an arts class and an academics class. In order to demonstrate this art and academic division, what follows is a description of researchers' observations.

Academic Classes

Academic classes reflected conventional teaching materials, instructional strategies, and student-teacher interaction. In the mathematics, history, language arts, and science courses, classroom organization was situated around established routines that were often teacher-driven and teacher-centered. For example, an instructional lecture on World War II in United States history was accompanied by silent student note-taking and outlining (history classroom observation, March 31, 2005). Additionally, a round robin read-aloud from the history text with teacher-facilitated questioning, was observed. In mathematics, students participated daily in a problem-of-the-day that was copied from an overhead into student notebooks (math classroom observation, March 31, 2005). The problem was then independently solved by each student, after which one student was called upon to reveal the answer and the method used to solve it. Classroom instruction in mathematics consisted primarily of an introduction of a skill, a teacher-driven discussion of that skill, followed by silent and independent practice by the students. In one particular science class, students spent no time at all interacting with either the teacher or one another (science classroom observation, March 17, 2005). The entire fifty-minute bell was devoted to the copying of definitions from the class textbook onto paper and the answering of end-of-chapter questions in a science text.

In language arts classes, more student involvement was noted, but there students were still clearly *doing school.* Students engaged in paired reading of a text, but teaching remained an activity facilitated by the educator, with a review of setting, plot, and characterization occurring largely as a whole class activity (Language Arts classroom observation, March 30, 2005). This instructional classroom conversation was dominated by the teacher asking close-ended questions with the students providing correct responses. There was also a daily language practice similar to problem-of-the-day in mathematics. Students were expected to copy sentences into a notebook, paying particular attention to correct capitalization, punctuation, and grammatical mistakes in those sentences. This was done independently by each student, after which one or more students were called upon to talk about the errors found and the changes made.

One exception to the little arts integration into academic classes occurred in a language arts class during the reading of *Mrs. Frisby and the Rats of Nimh* (O'Brien, 1971). After the students read and discussed the text, the teacher guided the students through a visualization activity (Language Arts classroom observation, March 30, 2005). During this activity, the students closed their eyes while the teacher read aloud selected sections of the text that were particularly descriptive of the underground rat home. Next, the students making pictorial representations of what they had envisioned while the teacher was reading. This activity was particularly well-received, with one of the focus students, SD, asking, "How should we draw the view—should it be a side view, an aerial view, or a frontal view?" to which the teacher responded that they could do whatever they wanted based on how they had visualized it.

These exceptions to established ways of doing school were few, and the majority of classroom time in academic classes was spent in dead-end curricular conversations, i.e. the type of discourse that focuses on correct responses to

close-ended questions where only one answer is perceived as appropriate because it revolves around classic texts and conventional academic activity (Applebee, 1996). The focus on conventional academic activity did not often include arts integration.

Art Classes

In opposition to academic classes, the arts classes demonstrated a more lively interaction between teacher and students, while at times incorporating conventional academic activity. In the visual arts, music, and dance courses, classroom organization was situated around more flexible routines that were often student-initiated and task, project, or performance-oriented. An instructional lecture, for example, in a visual arts class consisted primarily of the teacher engaging in artistic criticism with individual students in a voice loud enough for other students in the classroom to hear (visual arts classroom observation, January 27, 2005). Moving about the room looking at student compositions, she discussed blending and coloring techniques, tint choice, shading, light sources, and visual perspectives that were both specific to a particular to a student's work and general enough to be informative to the entire class. She responded pleasantly and thoroughly to questions presented to her without hand-raising or turn-taking. Throughout the class, the teacher made broad statements regarding art in the real world, which consisted of telling the students that when drawing, they should "rely on what they already know about the world to think about and fix mistakes" in their artwork, to use natural coloring so that the compositions would have a real world perception. Students, as both artists and art critics, were expected to work on their own compositions, but were also encouraged to look at and appraise the work of their peers, offering suggestions and encouragement in a manner similar to the teacher.

Likewise, in a string ensemble course, the class was a flurry of activity (string ensemble classroom observation, January 27, 2005). The students tuned their instruments and did warm-ups independently, by instruments (violins, violas, bass, etc.), and by section, while the teacher reminded, instructed, and encouraged students to watch their arm position, their sitting stance, and the compositional tempo. Teaching took place in the context of a performance task—the students were playing the *Brandenburg Concerto*—while the teacher concurrently focused on and corrected students on their intonation, rhythm, and playing technique. Skills were introduced then, in a larger context, and like the visual art teacher mentioned above, the ensemble teacher fielded questions from students who had not been acknowledged by being called upon in a traditional manner. The teacher would find identifiable problems in the compositions and point out to the students what to work on at home so that the vast majority of class time was spent on a collaborative activity.

In the spirit of knowledge-in-action, toward the end of this particular class, the teacher heard a couple of violinists trying to play the theme song from *Star Wars*. Instead of correcting these students for engaging in an activity unrelated to the class project, he stopped the class and helped these violinists find the notes they were looking for in a difficult section of the piece, and then returned to the concerto on which the class had been working. In doing so, the teacher kept music relevant to students' lives, allowing them voices in the construction of the curricular conversation.

Integration

While there were few examples of academic classes integrating fine arts activities into daily planning, there were examples of fine arts classes that utilized conventional academic activities in their coursework. Traditional pen-and-paper tests were observed in music, visual art, performance theater, and dance courses. Students reported taking vocabulary tests of "lots of hard French words" in dance and musical terms and symbols in instrumental and vocal classes (interview with KD, January 27, 2005). Additionally, students were expected to learn how to "sight read and understand" written music parts, including the melody and up to eight separate harmony parts. BD suggested that his orchestra class utilized mathematics because the teacher "like says you have to count this beat, like we have like two quarter notes is equal to like a half note…like a quarter note times two equals a half note" (interview, January 27, 2005). BD also reported "learning the history of acting and drama," as well as studying and writing biographical sketches of the lives and works famous artists, actors, and musicians.

This was significant in that, through this use of traditional activity, students employed more than just the *doing* aspects of the fine arts. By engaging in receptive and expressive vocabulary development, contributing to the curricular conversation in the classroom, and receiving constant and positive feedback from the teacher and one another, students also learned ways of knowing and thinking about their art. Students were able to participate not only in the community of *practice* of their art form, but also became members of the *discourse* community that knew, reflected, and talked about that art form. In this way, students were encouraged to enter into contemporary conversations about the learning in which they were currently involved, rather than learning *about* issues, trends, past events, or acquiring information that was not within the context of their lived experience.

Students' Curricular Perceptions

Despite some observational evidence of integration of arts and academics, students themselves were limited in their perception of that integration. Perhaps this is related to their inability to recognize the arts curriculum as an ongoing and cohesive course of study while they were able to identify cohesiveness in their academic classes. For example, the students seemed to have no idea how the teacher chooses topics or plans lessons, and rarely had a sense of what is coming next. Unlike the academic curriculum, which was often guided by a course text and one unit of study in that text follows another, the arts curriculum was, from the students' perspective, more random. Students were often unable to

anticipate the direction of curricular topics and activities, and had difficulty making sense of a cohesive curriculum. As KC, a fifth grader, stated in her initial interview: "I have no idea [how the teacher decides what to teach in her arts class] because nothing has one thing in common because it's just kind of confusing because we learn one thing, then another. I'm not really sure how she does it" (interview, December 7, 2005). KC further indicated that the teacher often "surprises" the students with what materials, activities, and assignments follow one another, and that she had "no clue" how the teacher determined what would come next in the planning of arts lessons.

This inability to recognize a cohesive curriculum in arts courses was also evident in talking to LZ, an eleventh grader (interview, May 20, 2005). Regarding her drama course:

> DBS: Do you have a sense of what [material or arts activity] is coming next?
>
> LZ: Not really.
>
> DBS: How do you think the teacher decides what is coming next?
>
> LZ: No clue.

The same was true for her chorus class:

> DBS: How do you think the teacher decides what to teach?
>
> LZ: Uh, she, sometimes she'll pick something and we'll sing it for about a week and she'll say, OK, I don't like it and it's basically, she picks a bunch of songs that are hard enough for us and we'll learn something from it but if we get to a point where we're not getting it or our voices aren't blending the right way, she'll throw it out.
>
> DBS: Do you have a sense of what [material or arts activity] is coming next?
>
> LZ: No idea.
>
> DBS: How do you think the teacher decides what is coming next?
>
> LZ: She just thinks what would be the next step up, I guess.

On the other hand, BD, a fifth grader, could see cohesiveness in his academic classes (interview, May 20, 2005). He explains his Language Arts class:

> DBS: How do you think your teacher decides what to teach?
>
> BD: Oooohhh….I think they like send her a list of things she has to teach and like she gets to pick which order she wants to teach 'em.
>
> DBS: Do you have a sense of what's coming next in the class? Like what she's going to teach next?
>
> BD: Yeah because like sometimes it's like she like to say the vocabulary… first you do synonyms and then antonyms and then completing the sentences. And then next week we do synonyms and antonyms and completing the sentence (laughs)

BD had similar ideas of cohesiveness regarding his math class:

> DBS: How do you think the teacher decides what to teach?
>
> BD: Well by probably she has like a schedule like what she's going to teach next like she like this week we'll work on measurement and then next week we'll work on a review of what we learned before in the quarter.
>
> DBS: Do you have a sense of what material is coming next?
>
> BD: Oh, yes, cause she likes gives a strip, a planning strip and having our planning in it like what we're going to do that week and everything.
>
> DBS: So each week you get one of those?
>
> BD: Yes, it tells us what we're going to do that week.

Students tended to see cohesiveness in the curriculum in academic classes but did not perceive it in their arts classes.

Discussion

The implications of our findings are relevant to educators interested in making the most of interdisciplinary curricula. For example, while academic classes rarely integrated arts activities, art classes were more likely to assimilate conventional academic activities. Because the integration of academic behaviors into arts classrooms appears to impact how students perceive the cohesiveness of the curriculum, it is important for educators to be transparent about the organization of their curricula, so that students know how and why it is organized. In doing so, students will be more likely to engage in the larger curricular conversations with an awareness of where it is going and from whence it came.

Second, whereas Seidel & Castaneda-Emanaker (2006) suggests that the arts and academic integration can connect a student to the knowledge and traditions of the larger community in a way that promotes participation in that community, in the eyes of the students at Midwestern Arts Academy, this was not that clear. Our intention was not to characterize the whole school, but to glimpse how students might experience integration of arts and academic classes. Our informants were all motivated students, who we reasoned might have the best chance to experience and recognition such integration. As previously mentioned, students perceived some integration (interview with KC, May 25, 2005):

> DBS: Do you ever do any kinds of arts activities in your history class?
>
> KC: Uhhh—no.
>
> DBS: OK, do you remember doing arts activities in any of your academic classes?
>
> KC: Yes.

DBS: Which one?

KC: Language Arts. We had to do a scrapbook about something we learned from a book, ummm…that… was…about it.

DBS :All right. Did you do any academic activities in your art classes?

KC: (responds immediately) Yes. We had to...

KC was then able to cite, quite easily, examples of her arts classes that had utilized traditional academic activities, but failed to initially recall even one example of arts activities incorporated into academic classes. Even though earlier in that same interview she had communicated the experience of using musical instruments in a science class involving a discussion of sound, she did not perceive that event as an example of curricular integration when asked about doing arts activities in academic classes. Other student interviews indicated that students in arts classes showed some ability to recognize the integration of traditional academic activities within the context of the more lively arts classroom setting. This suggests that teachers may have to be explicit with students regarding curricular integration (Burroughs, 1999). We assert that one way teachers can be explicit is by listing objectives and rationales for classroom activities, noting the integration as it is taking place in order to make education and schooling more relevant to students' lives.

Third, the organization of the school plays a role in integration. We suggest that arts and academic faculty collaborate in conducting faculty meetings, designing curricula, instructing students, choosing materials, and interacting with students. School structures and educators can model the type of integration we want students to perceive.

Conclusion

Although Midwestern Arts Academy held as its mission the integration of academics and arts, it was extremely complex to implement. The examples of integration that were evidenced within the classroom context were primarily initiated by teachers in the arts classes, such as vocabulary tests in dance classes, the historical study of acting and drama, and the support of music sight reading using mathematical concepts. Even within this context, educators in the arts classes utilized these traditional teaching activities and approaches as strategies to supplement and reinforce concepts. The arts classes remained, primarily, examples of "culturally significant traditions of knowledge-in-action" (Applebee, 1996, p. 37) where students concurrently learned, thought, knew, did, talked, and reflected upon the content area.

Why is this relevant? Integration and students' perceptions of the curricula are clearly intertwined. We believe that students' perceptions of the cohesiveness of the various curricula impacted whether or not they recognized integration. For example, the nature of the curricular conversation in the fine arts classes was different from the types of instruction and learning that occurred in the academic classes. Perhaps students perceived a slight amount of arts integration in their academic classes because they saw cohesiveness in the academic curricula, but little cohesiveness to the arts curricula. The academic courses employed teaching strategies, classroom routines, and student assignments that were conventional and teacher-centered, leaving fewer opportunities for students to engage in the type of "thinking" and "doing" necessary for student participation in the discourse community. However, we believe that students' familiarity with scholastic behavior impacted the students' capacity to perceive the cohesiveness of the academic curricula and recognize the integration of these behaviors and activities in the arts courses.

The differences in the nature of curricular conversations in arts and academics classes and students' understanding of "doing school" may help explain why curricular integration is so hard to do. Of course, school scheduling, school organization, and the demands of state standards may also contribute to the difficulty of integration as well. School scheduling often precludes opportunities for teachers to develop cross-curricular units or even share ideas; school organization, with separate arts and academic faculties, mean that teachers are hired for their perceived and enacted expertise in a field; state standards, especially in reading, mathematics, and science, make greater demands on the teachers and students with regard to mastering content, leaving less time for activities perceived as "unnecessary" or superfluous to that mastery.

But within the classrooms, the differences between the livelier conversations of arts classes and the "life-threatening," if not "dead" traditional exchanges in the academic classes were evident. Still, we are hopeful. We believe that with further research and practice, it will be possible to effectively mitigate the organizational and political factors so that integration is easier for teachers to negotiate and students to perceive.

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Appendix A: Attributes of Willing Participants

Student	Grade	Gender	Arts Majors						
			Vocal	Instrumental	Drama	Creative Writing	Visual Arts	Dance	Music Theater
LB	5	F	X	X					
AS	5	F	X						
KG	5	F			X	X			
AA	5	F	X		X				
RP	5	F		X			X		
SS	5	F	X	X					
AL	5	F				X		X	
KC	5	F				X		X	
DA	5	F						X	X
JW	5	M	X				X		
BD	5	M		X				X	
SD	5	M					X		
JL	11	F			X				X
KF	11	F						X	
LZ	11	F	X		X				
KSC	11	F		X				X	

Appendix B: Fieldnote Template

TOPICS	**ACTIVITIES**	**CURRICULAR CONNECTIONS**

Date of Observation:
Teacher name:
Primary content area:
Bell:
Student participant:

Appendix C: Interview Protocol

So what different kinds of things do you do in your [academic] class?

Which of these seems most important?

Which of these things seem least important?

How do you think the activities related to one another?

What do you like best about this [academic] class?

What do you like least about the class?

How is this different than last year's [academic] class?

What kinds of questions does your teacher ask?

What kinds of discussions does your class have?

What kind of tests do you have?

What does it take to do well in this class?

How does the teacher decide the grades are going to be?

What matters most in giving grades?

Why do you think you have to study [this academic subject]?

How do you think your teacher decides what to teach?

Do you have a sense of what's coming next in the class? What she's going to teach next?

How do you think the teacher decides what's coming next?

Imagine that you could change what is studied in you class. What would you change and what would you keep?

What is your favorite subject in school? Why?

What's your least favorite subject in school? Why?

What's your least/most favorite performing arts class? Do you take more than one?

So we're going to talk about [your performing arts class]. What different kinds of things do you do in this class?

Which of these seem most important?

Which of these seem least important?

How are the activities related to one another, the activities that you do in your [performing arts] class?

(repeat questions above for performing arts class)

Single-Case Designs and Qualitative Methods: Applying a Mixed Methods Research Perspective

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Abstract

The purpose of this conceptual paper is to describe a design that mixes single-case (sometimes referred to as single-subject) and qualitative methods, hereafter referred to as a single-case mixed methods design (SCD-MM). Minimal attention has been given to the topic of applying qualitative methods to SCD work in the literature. These two approaches potentially can be integrated using a mixed methods perspective to yield a powerful approach for understanding localized causality and describing intervention application. The SCD-MM also can be used within the context of action research if the purpose of such work is to investigate a causal question.

Introduction

Single-case designs (SCDs) are a form of interrupted time-series designs developed to yield causal evidence of intervention effects (Kratochwill, 1978; Kratochwill & Levin, 1992). These approaches use an individual case to serve as its own counterfactual and a dependent variable, typically an operationally-defined behavioral or academic outcome, is repeatedly measured across phases when a treatment is present and phases when it is not. A case is often an individual person, yielding the competing term *Single-Subject Designs*. However since the design is sometimes used with aggregated units such as a classroom, such as when testing the impact of group contingency programs on class-wide behavior, the term *case* is often used in the literature. A key feature of a rigorous SCD is the experimental manipulation of a treatment with each case yielding its own counterfactual data (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005). That is, the experimenter has control over and actively manipulates the introduction of a treatment and seeks replication of its impacts on a dependent variable, and compares performance between or within subjects across design phases. Details on basic design options are described below. When an SCD is well conducted, it is thought to yield unambiguous evidence of treatment impacts (Hayes, 1981; Hersen & Barlow, 1976; Horner et al., 2005; Horner & Spaulding, in press; Kazdin, 2003; Kratochwill, 1978; 1992; Kratochwill & Levin, 1992; Krishef, 1991; Morgan & Morgan, 2009; Task Force on Evidence-Based Interventions in School Psychology, 2003; Tawny & Gast, 1984).

SCD's ability to yield causal inference about a treatment effect has made the design a critical aspect of psychological and educational research. Its historical roots date back to the 1800s in studies of human perception; more commonly used applications in behavioral psychology took root in the literature in the 1950s (Krishef, 1991). An important feature of these designs is they can be applied with small sample sizes and/or rare settings. If for example one hopes to test the impact of a treatment on children with autism, it would be difficult to recruit enough participants to conduct a well powered randomized controlled trial (RCT). Furthermore, SCDs allow for some flexibility in terms of treatment delivery, as investigators can use early outcome data as reason to alter course. When comparing SCDs to RCTs and other group approaches such as quasi-experiments and regression discontinuity designs, SCDs focus on treatment impacts for a particular case and thus makes it harder to generalize findings outside of the study. On the other hand, their capacity to be used with small samples can allow for rigorous evaluations in localized settings, for example, in the application of action research to answer culture- or context-specific questions regarding causality.

Today SCDs are reported in several professional journals and have garnered the attention of the evidenced-based practice movement in education (Horner et al., 2005; Task Force on Evidence-Based Interventions in School Psychology, 2003; What Works Clearinghouse, n.d.), and other areas such as speech and language pathology (e.g., Schlosser, 2005). Indeed, the What Works Clearinghouse is in the process of designing standards for evaluating the causal validity of these designs as part of the project's attempts to summarize the evidence base for different educational interventions, and its work may further raise the general awareness of this class of designs. In sum, SCDs represent an important niche in the design literature.

Another movement within the social sciences is the proliferation of mixed methods research designs. Mixed methods research entails a design in which "the investigator collects

and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry" (Tashakkori & Creswell, 2007, p. 4). There is now a handbook of mixed methods research (Tashakkori & Teddlie, 2003), with an updated version in development as of this writing, the *Journal of Mixed Methods Research* (Tashakkori & Creswell, 2007), and burgeoning literature on these designs across diverse fields (Creswell, 2009). Although there are classic studies that use multiple methods spanning qualitative and quantitative approaches (e.g., Rosenthal & Jacobsen's [1968] work on the Pygmalion effect), the mixed methods field has grown out of the so called qualitative and quantitative paradigm wars (Tashakkori & Teddlie, 2003). Indeed, mixed methods research has been termed a "third paradigm" in that it is distinct from qualitative and quantitative modes of inquiry (Johnson, Onwuegbuzie, & Turner 2007). Contemporary work in mixed methods now focuses on ways to use planned integration and synergies of qualitative and quantitative work to yield designs that answer questions that extend beyond the reach of a singular paradigm (Nastasi, Hitchcock & Brown, in press). SCD-MM can potentially play an important role in the implementation of action research to solve localized problems (alternatively, the adaptation of evidence-based interventions in local contexts), particularly in addressing questions of causality when RCT designs are not feasible.

Purpose

Minimal attention in the literature has been given to applying a mixed methods perspective to SCDs. EBSCO was consulted in October of 2009 to check this assertion. The terms "mixed methods" was paired with "SCDs," and the search yielded nine hits from all available databases. It does not appear that any of the resulting citations explicitly discuss mixing SCDs with qualitative inquiry.[1] Incidentally, searching for single *subject* designs yields even fewer citations, which also do not appear to focus on mixing SCDs and qualitative work but instead mention both designs within the same text.[2] One exception is a dissertation by Gonzales-Lopez (2008) that used what was described as a mixed methods multiple baseline design. Despite the fact that the SCD research and qualitative traditions are quite different, the apparent inattention to combining the approaches is surprising since it seems that adding qualitative techniques (e.g., interviews, records reviews, etc.) would be convenient and could potentially go a long way in terms of elaborating on findings from SCD work. Furthermore, prior qualitative work where classroom and school contexts are examined could possibly set the stage for well targeted SCD investigations. The purpose of this paper is to provide a conceptual overview of how a mixed methods framework can be applied to SCDs, and a brief review of methods from each tradition to offer applied, introductory ideas.

Framework

The SCD and qualitative modes of inquiry may well have styles that, on the surface, appear to be incompatible. After all, SCDs appear to follow a traditional scientific paradigm in which theory informs a hypothesis, which then is empirically investigated via data analyses (Kratochwill & Levin, 1992). Although SCDs limit and even eschew statements of statistical significance in favor of logic and visual analyses (i.e., attending to changes in level of a given behavior/dependent variable that has been repeatedly measured, trend, latency of observed effect after experimental manipulation, etc.) and can alter treatment in the course of the study, the overall mode of inquiry is reasonably well aligned with traditional postpositivist perspectives (Creswell, 2009). Furthermore, SCD scholars want to further develop statistical techniques to analyze SCD data to support quantitative inference (Kratochwill & Levin, 1992; Shadish, Rindskopf, & Hedges, 2008) and view the design as a type of experiment with goals similar to that of a RCT (Horner et al., 2005). Indeed, one can apply randomization techniques within a SCD to support inference (Kratochwill & Levin, 1992). If one accepts that SCDs are best thought of as quantitative, postpositive experiments even if they are quite different from RCTs in terms of scope and application, one may wonder about philosophical difficulties when including qualitative techniques. After all, qualitative approaches tend to be more exploratory in terms of their goals and reflect constructivist and advocacy worldviews (Creswell, 2009). This is the very crux of the paradigm wars (Onwuegbuzie, 2002).

Although some researchers are still debating the relative benefits of qualitative and quantitative approaches, mixed methods scholars have moved beyond the paradigm wars. Briefly, it is erroneous to assume that qualitative investigations do not pursue causal questions (Brantlinger, Jiminez, Klingner, Pugach, & Richardson, 2005; Maxwell, 2004a; 2004b), and indeed, establishing causality is a matter of logic that can at times be found in qualitative studies (Shadish, Cook & Campbell, 2002). Furthermore, many who work in the mixed methods field have adopted philosophical perspectives, such as pragmatism, that serve as a basis for combining quantitative and qualitative designs (Johnson & Onwuegbuzie, 2004; Morgan, 2007). Pragmatism suggests researchers should be able to choose and mix methodologies that are best suited for the research question at hand. Johnson, Onwuegbuzie and Turner (2007) add to this idea via their notion of contingency theory, which in essence suggests that situational needs drive choice of research method, be it quantitative, qualitative or a mixed approach. In terms of combining the two approaches, Onwuegbuzie and Johnson (2006) describe a mixed methods legitimation model. Legitimation deals with validity across methods used in a study, in this case qualitative and SCD, and how their mixing can

1 Searching for case studies in the context of mixed methods work yields several articles as this is an oft discussed topic. Case studies and SCDs are however different designs

2 For example, Creswell (2009) classifies SCDs as essentially quantitative designs but does not comment on potential mixed methods applications.

yield stronger inference. There are other models but this one considers a mixed methods perspective in terms of all phases of design, including:

- obtaining a sample (i.e., using both quantitative and qualitative approaches to understand a sample);
- balancing the perspectives of the researcher and research participants (i.e., dealing with *emic* and *etic* perspectives, which are described below);
- minimizing weaknesses of subcomponent designs via their combined use;
- whether to make a design sequential or concurrent (i.e., if the design is broken into distinct phases such as doing qualitative work followed by an SCD or if both features are used at the same time);
- converting data for analysis (i.e., transforming qualitative data to quantitative and vice versa);
- mixing at the paradigm level (i.e., determining if and to what extent the researcher believes design approaches are integrated);
- the extent to which inferences reflect integration of qualitative and quantitative perspectives;
- dealing with the multiple forms of validity that comes from different methods and how these influence inference (e.g., whether credibility techniques have been applied to qualitative data and how this inter-relates with features of a high quality SCD); and
- the value stakeholders place on mixed methods findings.

The mixed methods field has addressed the use and integration of multiple methods and integrating while questioning everything from basic philosophies of design, through sampling, analyses, to inference and consumer perspectives. Even if one assumes SCD is postpositive in its orientation, mixed method researchers would argue it is possible to enhance their use via qualitative methods. Having established a basis for mixing SCD and qualitative traditions this paper reviews the basics of two commonly used SCDs, borrowing from works such as Horner and colleagues (2005), Kazdin (2003), Kratochwill and Levin (1992), and Morgan and Morgan (2009). Qualitative techniques, particularly from an education research perspective, are also summarized from Bratlinger and colleagues (2005), Maxwell (2004b), Nastasi and Schensul (2005) and Patton (2002).

An Overview of SCDs

A proper review of the SCD literature would entail a book-length manuscript (see for example Morgan & Morgan, 2009), and even an overview of most design options cannot be easily handled within part of a paper that has established other goals. Hence, this section endeavors to provide a cursory discussion of the most basic SCD designs with a focus on those features that are germane to mixed methods applications presented below. Readers interested in learning more are encouraged to consult the citations used, particularly Horner and colleagues (2005).

A commonly used SCD is the ABAB design (also called a reversal or withdrawal design) where baseline data (the A phase) is collected on some phenomenon for one or more cases. For purposes of illustration, assume a design where the investigator is interested in reducing the number of times a student is talking out loud at inappropriate times, such as when a teacher is offering a lecture or answering another student's question. Also assume "talking out loud" is operationally defined so that observers could reliably agree on whether or not a student is engaged in the target behavior and some measurement scheme is put into place to assess how often it occurs. These data are graphed to obtain a sense of its stability (i.e., whether the talking is highly variable or not) and level. Once the investigator believes the baseline will allow for reasonable inference of how often it is likely to occur absent treatment, an intervention is introduced (the B phase). Incidence of the target behavior is then tracked using the same observation scheme to see if it alters as expected, which can be determined by visually inspecting changes to level and variability. Key issues at this stage are the latency of effect (i.e., it is easier to claim causality if the impact is observed immediately after treatment begins), whether the behavior changes in a manner predicted by the treatment's theory of change, and if indeed the investigator has experimental control. In this first treatment phase, repeated measures of the target behavior are taken until stability is again established. A key design element in the ABAB framework is then to reverse the treatment condition (independent variable), hence the term withdrawal design. If behavior changes in a manner that is consistent with expectations after introducing a treatment, and reverts back to baseline levels when treatment is taken away, there is evidence of causality. This reversal function is especially compelling when performance/behavior changes occur in a time frame consistent with theory and general logic used to evaluate causal evidence. Use of any lesser design (e.g., an AB design) will leave causal inferences open to multiple threats to internal validity and is as problematic as a pre/post design. Finally, the treatment is typically reintroduced for the dual purposes of leaving the treatment in place and establishing a stronger case for causality by again demonstrating the effect (Horner et al., 2005).

Figure 1 provides an overview of the ABAB design. The figure depicts some key indicators allowing for strong causal inference regarding the effect of the treatment on the subject. Assuming there is experimenter control over treatment introduction and removal, there are three demonstrations of the intervention impact: (a) the change in level from the A to first B phase, (b) from the first B phase to the reversal phase, and (c) from the reversal to the second B phase. These effects appear around the vertical gridlines in the figure, which depict the onset and removal of treatment. As Horner and colleagues point out, this demonstration would address many threats to internal validity outlined by Shadish, Cook, and Campbell (2002). For example, ambiguous temporal precedence

(confusion about whether the treatment precedes the effect), history threats (co-occurring events that might explain the observed change), maturation (naturally occurring growth or change within a subject), regression to the mean (the tendency of extreme scores to gravitate toward the average), attrition (participant loss), and instrumentation (changes that occur via repeated measuring and habituating to a test) do not offer serious rival hypotheses for the observed impact. Because three demonstrations of the effect occur over three points in time, a standard suggested by Horner and colleagues (2005), it is unlikely that anything other than the treatment is responsible for the changes. It would be highly unusual for some co-occurring event to have been responsible for behavioral changes, the reversion back to extreme scores after treatment removal undermines concerns about regression to the mean, and the dramatic sway in scores would seem to limit concerns about maturation and instrumentation. Attrition is a non-issue as only one student is examined (more on this later). In short, this is a case where the intervention appears to have been responsible for reduction in talking out loud during inappropriate times.

Other details warrant consideration, such as, data patterns across and within phases, the number of data points per phase (notice the last phase in the example includes only four data points and a stronger case would be made with additional observations), and so on. Furthermore, the researcher can add cases to bolster findings or alter approaches such as in an ABABC design, where C is a new version of a treatment. One may attempt an ABACAC design if the first version of a treatment seemed problematic, was subsequently altered, and then the design proceeded to obtain causal data. Even in the simple example presented in Figure 1, SCD analysis techniques can be applied that go beyond the scope of this discussion. The purpose here is simply to provide a sense of how the ABAB design works.

Before leaving a discussion of SCDs, another commonly used option worth reviewing is the Multiple Baseline Design (MBD). In this approach, typically three or more baselines represented by three or more cases, or a single case reassessed in different contexts such as a math class, a reading class, and recess are collected. The baseline continues to represent performance prior to introduction of a treatment that is under the direct control of the experimenter. MBD options are typically used if there is reason to believe the dependent variable, such as academic skill, is unlikely to change after removal of treatment. Figure 2 represents a simple MBD with three students. For example, the baseline condition is existing mathematics instruction, and the intervention phase is a new technique. Assume the outcome measure is a short, simple, but psychometrically sound assessment of an elementary student's ability to multiply numbers and comes in multiple forms making repeated measures possible. This would be similar to measurement in a student progress monitoring context. The gridlines in the chart depict the intervention introduction for each student. As is the case with the previous example, each gridline demonstrates a causal effect because of the differential increase in math performance that co-occurs with the introduction of the new teaching technique (Horner et al., 2005). After the introduction of the experimental technique, there is an immediate increase in performance, followed by a steady upward trend where each student is regularly performing at the top of the range of the assessment at the end of the study. Threats to internal validity are addressed for many of the same reasons noted above. This prior discussion relies entirely on existing literature and should have provided some sense of how causal arguments are derived from simple SCDs. It is hoped that a contribution can be made in discussing how qualitative techniques can be used to bolster SCDs via a mixed method framework.

Ideas for Mixing Qualitative Techniques into SCD Designs

When conducted well, qualitative techniques are known for, among other things, capturing perceptions of research participants, systematically gathering data to understand natural contexts, summarizing records so as to understand background information, and so on (e.g., Creswell, 2009; Denzin & Lincoln, 2005; Patton, 2002). Nastasi and Schensul (2005) have considered how these broad approaches can contribute to intervention research and promote the validity of studies, yielding a possible framework for how qualitative techniques can inform SCDs. To summarize their points, qualitative methods can support intervention research by: (a)

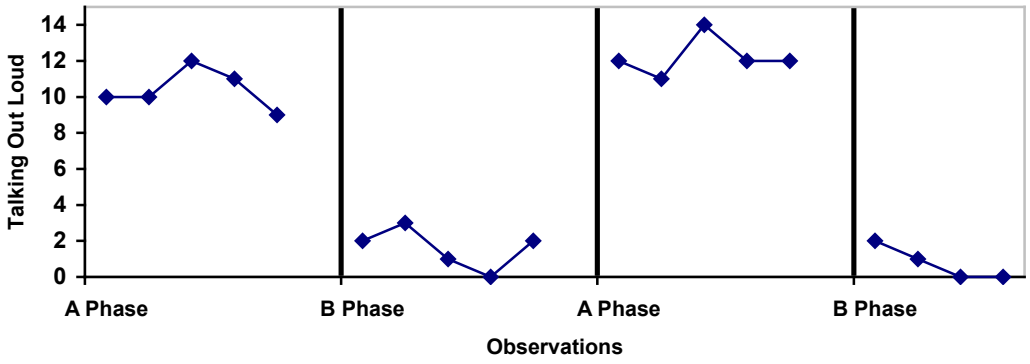

Figure 1. Depiction of a Simple ABAB Design

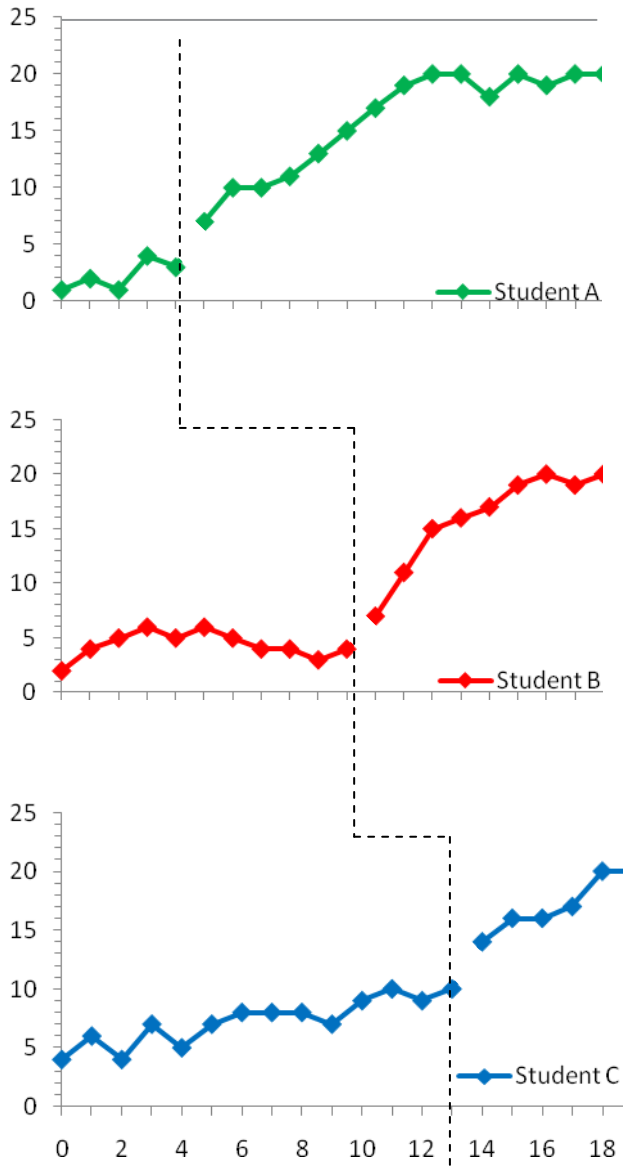

Figure 2. Depiction of a simple Multiple Baseline Design

helping to capture the participant's view of an intervention, referred to as the aforementioned *emic* view, as opposed to a researcher's *etic* perspective of what occurred during a study; (b) obtaining a sense of sample characteristics via in-depth examination of participant backgrounds; (c) obtaining systematic information about the natural context in which the study took place; (d) helping to generate outcome measures or at least interpret dependent variable data; and (e) promoting a strong sense of the researcher's role and possibly helping to articulate biases and interpretive errors.[3] Furthermore, as noted earlier the SCD-MM design may provide an alternative to RCT when engaging in action research (i.e., the process in which formative research informs development of localized theory and practice, followed by reflection and evaluation research) to test causal relationships in local settings.

3 Nastasi and Schensul include additional ideas. Only those that seemed directly germane to this paper are highlighted.

Each of these points is discussed in the following paragraphs (note that they are rephrased in some cases to organize text). When reviewing them, consider the distinction between causal description and causal explanation (Shadish, Cook, & Campbell, 2002). Causal description focuses on broad claims about whether or not an intervention worked, whereas causal explanation refers to what parts of an intervention worked and why.

Etic and Emic Perspectives

The broad tradition of qualitative work and specific fields such as anthropology have long attended to how one's perception of an event can be influenced by where one stands within a dynamic scenario with varying participant roles (Creswell, 2002). Consider classroom temperature. This is an objective, physical characteristic that can be precisely measured, yet if there are twenty people in a room there may well be twenty distinct perceptions on whether the temperature is ideal. A professor who is delivering a lecture, moving around the room and excited about a topic, may feel it is warmer than would a disinterested student who is sitting still. If the professor suggests that someone open a window because it is too hot, this, if you will, etic view is imposed on at least one if not more emic views. The point here is that these differing views can have important implications for research. Just as one might feel it is too hot and another it is too cold under constant temperature, it may also be possible that a researcher may see a treatment effect but a teacher or student does not. Hence, the practice of contrasting the etic and emic can have value in a SCD. Consider an intervention designed to help students with emotional-behavioral disorders who exhibit a particularly disruptive behavior. There is ample evidence that students are often unaware of just how disruptive they can be (American Psychiatric Association, 2000; Kauffman & Landrum, 2009). It would stand to reason that interviewing target students, their parents, teachers, and other stakeholders could go a long way towards better understanding the etiology and effects of the target behavior, whether students even recognize it as a problem, and offer insight into stakeholder perceptions of the features and effects of the intervention in question. Indeed, students are sometimes interviewed in the context of behavior management plans so that they in essence agree to a contract with teachers and parents in which conditions of the reinforcement contingencies are outlined. Older students sometimes benefit from understanding how a plan works and communicating about the effectiveness of given reinforcers (Kauffman & Landrum, 2009).

Generalizing a bit, although the researcher may have control of the presence of a treatment, someone else may be responsible for actually implementing it (e.g., a teacher) and this raises a host of issues about treatment acceptability, intervention fidelity, and social validity (Nastasi, Moore, & Varjas, 2004). Put another way, if a teacher is responsible for implementing a treatment, his or her related perceptions are critical for intervention planning and evaluation stages. After all, a teacher can change an intervention in both subtle

and not-so-subtle ways, whether intended or not. The implication here is that SCD researchers should be concerned about the perceptions of relevant stakeholders when it comes to intervention delivery and measurement, and open-ended interviews can help identify any concerns about treatment delivery as well as opportunities to capitalize on intervention strengths. Table 1 provides an overview of how qualitative methods can be applied to SCDs prior to the treatment, as well as during after implementation.

Table 1
Qualitative Methods Applied to Single–Case Design

Pre-implementation
• Participant (narrative) observations of the context to better define the behavior and contingencies; possibly across contexts to better understand contextual variations
• In-depth interviews to facilitate clear definition of target behavior and contingencies from perspective of multiple informants (student, teacher, parent); to examine acceptability and social validity of proposed interventions
During Implementation
• Participant (narrative) observation of context in which intervention is implemented to identify unintended impacts, changes in behavioral manifestation, changes in context; document integrity/fidelity; identify other factors that facilitate or inhibit implementation and might subsequently explain success or failure of intervention
• In-depth interviews with multiple informants (student, teacher, parent) to track acceptability, integrity, social validity, impact; and to facilitate identification of other factors that facilitate/inhibit implementation and success
Post-implementation
• Participant (narrative) observation in same and related contexts to determine extent of generalization across time and context; identify factors that facilitate generalization
• In-depth interviews with multiple informants (student, teacher, parent) to examine perceptions of acceptability, integrity, social validity, and outcomes; and facilitate identification of contributing factors

Sample and Contextual Characteristics

The issue of etic and emic perspectives helps highlight a point that does not seem to receive much attention in the SCD literature but has important implications for practical application of the design. Simply put, it is important to know your audience, and when defining an audience, to think through the various stakeholders in the SCD context. There is the obvious point of attending to issues such as a research participant's age, gender, and various cognitive characteristics that might influence intervention applications. But, as noted in Table 1, prior in-depth interviews with participants who will be treated may reveal much about their experience with the proposed intervention and whether they find elements of it to be particularly palatable or distressing.

Additional sample characteristics that may be germane to intervention delivery are of the cultural sort. Members of a majority often experience difficulty recognizing their culturally specific values, cognitions, and language, as well as how these can manifest to influence their behavior (Rogoff & Morelli, 1989; Sue, Bingham, Porche-Burke & Vasquez, 1999; U.S. Department of Health and Human Services, 2001). Also complicating matters is that, even when cultural influences are recognized during service provision, related behavioral manifestations in both service providers and treatment recipients can be highly dynamic. This is because cultural influences change according to context, and the knowledge base on this issue is limited (Hetherington & Martin, 1986; Lewis-Fernandez & Kleinman, 1995; Lopez & Guarnaccia, 2000; Rogler, 1999). In short, it is not unreasonable to be concerned that cultural differences can undermine intervention and assessment experiences in some situations and qualitative inquiry can help assess whether this might be an issue. Keep in mind that addressing stakeholder perceptions of a treatment and its impacts is not overlooked in the SCD design literature. Horner and colleagues (2005) recommend documenting fidelity and social validity of an intervention, and both goals can be supported by attending to sample characteristics that might influence treatment delivery.

Understanding sample characteristics via qualitative techniques may help address a particular weakness of SCDs: their limited external validity. As noted above, these designs focus on whether an intervention worked for a particular case (i.e., a student, classroom), but the fact that they are typically used with small samples limits generalization of findings. Generalization is largely a quantitative concept and puts the onus on the researcher to determine the degree to which a sample reflects a presumed population. Transferability, by contrast, puts the onus on consumers to determine if the characteristics of a sample and context of a study make findings relevant to their needs; this of course requires that the researcher reports the conditions in which effects occurred with enough detail to facilitate comparison to other contexts (Lincoln & Guba, 1985; Stake, 1997). If classic generalization from the quantitative paradigm is a difficulty for SCDs, then it would seem transferability is a weaker but tenable option if there is careful description of the sample and context in which the treatment impact was observed.[4] See the post-implementation section of Table 1.

Finally, qualitative interviews can help address attrition when it does occur (Shadish, Cook & Campbell, 2002). As noted above, this is typically a limited concern in SCDs because of small sample sizes. We assume that severe attrition of research participants probably leads to unreported studies if there is little outcome data to describe. But this doesn't mean attrition does not happen in SCDs, and the occasional report discusses how a participant was lost or even replaced. We suspect that in SCDs in which a group such as a class is the unit of analysis, attrition problems are more likely to occur. If participants within a group drop out of a study or are simply absent at key data collection points, interview-

4 The work by Shadish, Rindskopf & Hedges (2008), Schlosser (2005), Scruggs &Mastropieri (1998), Swanson & Sachse-Lee (2000), and others, pursue the intriguing idea of synthesizing SCD studies, which will go a long ways towards addressing generalization concerns.

ing them may help diagnose the extent to which sample loss undermines inference.

Choosing among Interventions and Outcome Measures

Measuring dependent variables in SCDs is a theory-based matter and it is often possible to select existing instruments or generate new observation schemes. Although SCDs have a long history of generating observation schemes, some traditional qualitative approaches may help improve the design. As noted above, SCD researchers pay attention to issues of social validity of outcomes. For example, a SCD may help assess whether a reinforcement technique promotes strict behavioral compliance, but most social scientists do not necessarily believe that unquestioning compliance is ideal. Hence, obtaining input from various stakeholders can help identify socially valid outcomes, which will influence the nature of the intervention as well as what is measured. Furthermore, qualitative methods can facilitate identification of unintended outcomes, whether positive or negative, through techniques such as participant (particularly narrative) observation and in-depth interviewing (see Table 1). Such open-ended techniques increase the likelihood of identifying changes not being tracked via more quantitative observations and ratings scales. The qualitative data could of course be followed by additional quantitative data collection.

Researcher Bias

In the qualitative tradition, researchers are often envisaged as data collection instruments who do not analyze data according to objective rules; there is for example no critical p-value to guide decisions. While qualitative research has been criticized for its subjectivity, others have countered that postpositive perspectives suffer from a delusion of objectivity (see Creswell, 2002; 2009). In the context of SCDs, some subjectivity may well be at work when decisions must be made about whether a baseline is stable, the best circumstances under which to begin treatment, and so on. Of real concern to SCD researchers is that analyses often rely on visual rules. Visual analyses entail their own form of judgment (e.g., can researchers reliably identify when a baseline is stable, or if the data demonstrate a causal relationship, etc.). One can therefore be concerned about whether visual analyses are consistent from one researcher to another, prompting some to continue to pursue statistical analysis options that can guide decisions about intervention impacts (Kratochwill & Levin, 1992). Qualitative techniques may help address these concerns via efforts to promote credibility of design and interpretation. These include techniques such as data triangulation, member checks, negative case analyses, peer debriefing, audit trails and external auditors, thick description, and prolonged engagement (Bratlinger et al., 2005; Nastasi & Schensul, 2005). For example, qualitative researchers will typically express any possible biases and expectations they may have about a phenomenon at the outset of a study, and use this to guide negative case analyses (i.e., attempts to find and explain disconfirming evidence). In the context of SCDs, at least one expectation is easy to identify: the treatment might work. Even the most objective among us would have to admit that an intervention would not be selected unless one thought it might have an impact (SCDs that compare treatments would seem to be more resistant to this sort of concern). Hence, qualitative traditions would seek any evidence, even if minimal, that suggests the results of a study may be erroneous. This could be done via careful examination of outcome data, interviews, and other records reviews.

Searching for such disconfirming evidence is only one strategy for promoting credibility of findings.[5] Another approach, which can be used in conjunction with negative case analyses, is to apply member checks that entail checking with stakeholders about the accuracy of qualitative data. Bratlinger and colleagues (2005) distinguish between level 1 and level 2 checks; the former is a check on accuracy of specific statements and comments and the latter is determining whether an aggregated theme matches well with stakeholder perspectives. In the context of a SCD, one could interview some or all relevant stakeholders about baseline and treatment features as well as the existence of an effect. In the above SCD example, the student might be asked about baseline and treatment differences, whether the treatment seemed reasonable and so on. Of course, one would have to rely on prior knowledge of students who are disruptive. As noted above, they are not always aware of the impacts of their own behavior. Teachers can be interviewed about issues such as whether they found the treatment to be palatable and what would be needed to sustain it. Furthermore, they should also be queried about its effectiveness as this can go a long way towards promoting acceptability and long-term use.

Cross referencing interview statements with SCD data yields an opportunity to triangulate information across methods. Triangulation typically seeks convergence of findings. For example, SCD evidence indicates a treatment impacted a target behavior and statements from stakeholders also suggest that it worked. When findings are divergent, such as when SCD data suggest the intervention is effective but a teacher suggests otherwise, the researcher attempts to explain why. If a reasonable explanation can be posited (e.g., it is clear from interview data that a teacher simply disliked a given treatment), then another finding can be reported. Indeed, such a finding would demonstrate the advantage of mixed methods designs because such discrepancies are not easily identified via the use of a single method (Tashakkori & Teddlie, 2003). If divergence cannot be explained then at least a study limitation is identified.

Any given set of qualitative data can be further checked via audit trails, external auditors, and peer debriefing. Briefly, audit trails entail documentation of all study procedures and

5 The rest of the credibility techniques listed here are commonly described in qualitative research methods overview. Sources used for this paper were drawn from Lincoln and Guba (1985), Maxwell (2004), Nastasi and Schensul (2005) and Patton (2002).

transcription of qualitative data for later accuracy checks. External auditors can be brought in to independently verify if the same qualitative themes and conclusions can be reached from raw data. This is typically done with a subset of the data given the level of effort involved with qualitative analyses. Peer debriefs entail consulting with experts in the field about study results to see if they match the literature and to yield alternative inferences. Surprising findings cause the researcher to review related data. Combined, these approaches can go a long way toward addressing aforementioned concerns about researcher bias. In addition, these steps are consistent with SCD work where visual analyses are often independently reviewed, careful records are kept on observation data, and so on.

Prolonged engagement refers to putting in sufficient time and applying multiple methods (e.g., interviews, focus groups, records reviews) to promote understanding of the phenomenon of interest. In the context of an SCD where one wants to understand contextual variables that influence the treatment effect and whether a treatment is like to be adopted, one could engage in a priori analyses on pertinent records (e.g., student discipline and academic records, related schoolwide records, etc.), observe teacher styles and interactions with specific students, and so on. After the SCD is completed, a researcher could observe follow-up use of techniques to see if they were adopted with fidelity and if additional support is needed. See the post-intervention section of Table 1.

All of these various approaches can serve to meet one of the primary aims of qualitative work which is to yield a thick description of the phenomena of interest. In this case, the presence of a treatment effect and factors that may have promoted or undermined it. Thick description entails providing key quotes and detailed depictions of events that allow readers to make judgments about findings and their applicability to new contexts (recall the earlier discussion of transferability and post-implementation procedures in Table 1). In the context of a SCD, one might identify specific testimonies about the intervention, its implementation, or even perceived impacts, which can be used to supplement graphed data and results of visual and statistical analyses.

Conclusion

The purpose of this paper is to review features of qualitative and SCD research in order to both justify mixing the two and identify preliminary ideas of how they might be mixed. The overall conclusions are that, despite the fact that mixed method SCDs appear to be absent from the design literature, there need not be a philosophical barrier for combining the two traditions, particularly if one adopts a pragmatic perspective. The benefit of doing so is the basic SCD design can be improved via increased knowledge of context and stakeholder perceptions of the treatment. This additional information can yield insight on treatment acceptability which in turn can address intervention fidelity in future applications. In addition, the additional qualitative data may move findings from causal description to the more complex matter of causal explanation. General strategies for mixing the approaches are presented in Table 1 by considering how qualitative work can be applied before, during, and after the SCD.

More advanced treatments of mixed method work focuses on ways to generate iterative and synergistic designs in a planned way, keeping in mind that some mixed methods researchers argue that not all analyses can necessarily, or even should, be identified a priori. The groundwork described here provides a basis for such plans but the idea can be advanced via an actual trial run of a mixed method SCD with these principles in mind. In addition, attention could be paid to specific types of mixed method studies that match well to ideas discussed here. For example, Creswell and Plano-Clark (2007), Morse (2003), and Leech and Onwuegbuzie (2009) discuss typologies that consider whether one approach is dominant and if the stages are sequential (e.g., qualitative followed by quantitative) or concurrent. Given the introductory nature of this work, we have avoided making specific suggestions about such details because it is not hard to imagine situations where sequential designs may be preferred over concurrent and vice versa, or even ones where qualitative work may dominate over quantitative in the case of a mixed method SCD. In sum, a mixed method SCD may offer a contribution to the design literature and we hope to see more of them in the literature. Moreover, for those researchers who hope to draw causal inferences from action research in localized settings, SCD-MMR provides an alternative to more traditional designs.

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An Examination of Collaborative Learning Assessment through Dialogue (CLAD) in Traditional and Hybrid Human Development Courses

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Abstract

This investigation assessed the effectiveness of using Collaborative Learning Assessment through Dialogue (CLAD) (Fitch & Hulgin, 2007) with students in undergraduate human development courses. The key parts of CLAD are student collaboration, active learning, and altering the role of the instructor to a guide who enhances learning opportunities. The effectiveness of this approach was explored in both hybrid formats where classes reduce face-to-face meeting time by incorporating on-line activities and traditional course formats, such as lecture. A sample of 169 students completed courses in human development either using CLAD or using traditional techniques that provided more direct instruction. In addition, some of the classes were taught in a hybrid format. In two of the comparison group subsets, students in the CLAD group demonstrated significantly higher final grades. Hybrid course formats resulted in higher student achievement as well. These results provide preliminary support for the use of CLAD and hybrid formats in higher education settings.

Previous research has indicated that cooperation in academic settings is more conducive to student achievement than competitive or individual efforts (Johnson, Johnson, & Smith, 2007). Johnson and Johnson (1989) reported that cooperative efforts in the classroom result in greater student achievement, greater retention of course material, more use of critical thinking and meta-cognition, greater transfer of learning, and improved problem-solving abilities. The concept of students working together has been discussed in the literature by two similar but distinct approaches: cooperative learning and collaborative learning. Fitch and Hulgin (2007) indicated that cooperative learning and collaborative learning have five characteristics in common. Both approaches involve a common learning activity designed for groups, cooperative behavior, positive interdependence, a small-group learning structure, and accountability and responsibility on the part of the individual.

While cooperative learning and collaborative learning appear to have much in common, they emanate from different theoretical backgrounds. The term cooperative learning is associated with the work of Johnson and Johnson (1989, 1994). According to Johnson and Johnson (2006), cooperative learning is based on social interdependence theory. Social interdependence exists in groups when members' outcomes are affected by the actions of the other group members. The theory evolved from Gestalt psychology and Lewin's Field Theory. Deutsch (1949) was the first to formally describe social interdependence theory and he indicated that group members' actions can be positive or negative. That is, group members can aid each other in attaining group goals or they can hinder goal attainment. Collaborative learning, however, is born out of the socio-cultural theories of Vygotsky (1978), Rogoff (1990, 1998) and Wertsch and Toma, (1995). The defining characteristic of collaborative learning is the co-construction of shared meaning through discussion, which is absent in cooperative methods (Fitch & Holguin, 2007).

*CLAD (Collaborative Learning Assessment through Dialogue***)**

CLAD is based upon Vygotsky's (1978) socio-cultural theory which views learning as a social process. The CLAD method views social interaction as a critical component of cognitive development. The basic assumptions of CLAD are that learning is social; cognitive conflict (referring to the Piagetian concept of disequilibrium where one is faced with concepts that challenge current knowledge and require a transformation of schemas) (Piaget, 1926) is essential to the learning process; individuals are more likely to evaluate and change their ideas during peer-driven dialogue; and immediate feedback is essential to the learning process (Fitch & Hulgin, 2007). CLAD has three primary components: working in teams to complete a series of true/false study questions; group quizzes; and immediate feedback. The true/false study questions are designed to facilitate student dialogue, critical thinking, and cooperation. The group quizzes are used because dialogue among peer group members is thought to be a critical component of cognitive development (Johnson & Johnson, 1994; Verba, 1993). According to Fitch and Hulgin (2007), the CLAD method is designed to bring forth cognitive conflict as a means of attaining the highest

levels of learning. Quiz questions, therefore, should cause high levels of dialogue and problem solving among group members. The group quizzes are designed so that students receive immediate feedback, allowing better understanding of the material before moving to the next topic. Immediate, corrective feedback is thought to be essential for academic achievement (Bloom, 1976; Levin & Long, 1981).

These components of CLAD allow for the use of structured collaboration and cognitive conflict in the classroom which, in turn, leads to academic and interpersonal benefits (Johnson, Johnson, Pierson, & Lyons, 1985). Academic benefits associated with the use of collaborative learning include higher quality reasoning, greater achievement and retention, more frequent creative insight better problem solving, and decision making, greater sharing of expertise, greater task involvement, and positive attitude change (Fitch & Hulgin, 2007).

Given that the CLAD method was recently found to be highly effective in elementary settings (Hulgin & Fitch, 2007) and Johnson, Johnson and Smith (2007) reported that cooperative techniques are an accepted and preferred method of instruction at all education levels, this study explored the application of CLAD to a college student population. Collaborative methods promote active learning and social interaction, two key factors of high achieving classrooms (Hulgin & Fitch, 2007). While collaborative methods have been shown to be beneficial at all educational levels, little if any work has examined the use of collaborative methods in blended formats such as hybrid courses. One of the purposes of the present research is to address this gap in the literature. Thus, the effectiveness of collaborative learning will be examined in hybrid courses as well as in more traditional classroom settings. It is hoped that a combination of collaborative learning and hybrid formats will be successful in term of student achievement in the classroom.

Hybrid Formats

Blended, or hybrid, classes combine traditional classroom learning with distance education (Williams, 2002). Specifically, in the hybrid classroom seat time is reduced and replaced with assignments using an online format (Vaughan, 2007). Arabasz, Boggs, and Baker (2003) found that about 80% of higher education institutions offered hybrid courses, a number that has likely increased since that time. Hybrid courses have become substantially more popular due to the increased use of web tools such as Blackboard. Recently, there has been a push in recent years for colleges to offer online or distance learning courses due to the growing number of students who have both work and family commitments that make the time flexibility of online courses especially attractive (Vaughan, 2007).

Research on the effectiveness of distance education has produced mixed and confusing results. Tallent-Runnels et al. (2006) reviewed research on online education and stated that empirical findings were less prevalent than anecdotal and descriptive findings, but that learning outcomes were comparable to traditional methods, and students liked working at their own pace. However, the effects of blended learning formats have not been extensively studied at this time although some preliminary findings are favorable. For example, according to Vaughan's (2007) review of existing research on blended or hybrid courses, improved learning outcomes and student preference surveys have supported the use of a blended format. Specifically, students gain flexibility with class time while still maintaining personal contact with instructors.

Garnham and Kaleta (2002) surveyed students about their attitudes toward hybrid courses. The majority of students who participated indicated that they could control the pace of their own learning, were better able to organize their time, and felt that there should be more hybrid courses offered at the university. Aycock, Garnham and Kaleta (2002) added to the favorable findings by reporting that 80% of students who took a hybrid course at the University of Wisconsin, Milwaukee said the experience was positive and that they would suggest such a course to others. After reviewing studies on learning outcomes associated with hybrid or blended learning courses, Vaughan (2007) concluded that hybrid courses have higher academic success rates (as measured by the number of students obtaining a C or better in the class) and lower withdrawal rates than courses with non-hybrid formats. Vaughan also stated that student retention in hybrid courses is better than in online courses and similar to the retention rates associated with traditional courses.

From a faculty perspective, there seems to be a high level of satisfaction with the hybrid format. Faculty report enhanced teacher-student interaction, increased student engagement in learning, flexibility of the teaching and learning environment, and opportunities for continuous improvement with blended formats (Aycock et al., 2002). In summary, it would appear that hybrid formats are superior to traditional classroom formats in terms of student achievement (Vaughn, 2007) and faculty satisfaction.

A review of research on teaching methodology seems to support the use of nontraditional approaches, such as collaborative learning and Hybrid models, over traditional lecture methods. In this study we not only wanted to test that assumption, but also wanted to explore combinations of nontraditional methods. We designed a series of studies to determine if one specific form of collaborative learning (CLAD) is effective in college level human development courses taught in several formats. We proposed four main hypotheses based on the literature:

1. Students in CLAD classrooms will have higher academic achievement as assessed through course grades than students in traditional classrooms.
2. Students in CLAD Hybrid classrooms will have higher academic achievement than students in CLAD non-hybrid classrooms.

3. Students in CLAD Hybrid courses will have higher academic achievement than students in hybrid courses.
4. In addition to improved academic performance, students in CLAD classrooms will view collaborative methods as effective.
5. Students in the hybrid course will have higher academic achievement than students in the traditional course.

Study 1: Child Development

Method

Participants

A sample of 94 students enrolled in one of four courses participated in the first study. The traditional Child Development course had 14 participants (mean age = 28), with 13 of the participants being female (93%) and 13 being White (93%). The CLAD Child Development course was much larger with 28 participants, but similar in terms of age (mean age = 27). Of the 28 participants in our sample, 26 were female (93%) and 27 White (96%). The hybrid Child Development course consisted of 14 participants (mean age = 23), who were all White with 12 (86%) being female. Lastly, the combined CLAD - Hybrid Child Development course had 38 participants who were again all White with 30 females (79%) (mean age = 22).

Procedure

Participants were enrolled in one of the human development courses taught by the first author over 2 years. The fundamental difference between all four courses was in the use of the CLAD process and hybrid formats. One was taught in a traditional manner, where lecture and other direct instructional techniques were the primary method of instruction. The second course used a CLAD model of instruction. The third was taught in a hybrid fashion, where in-class sessions were lecture based, but there was also a web-based component. The fourth course used CLAD in a hybrid format. In all classes, student academic achievement was assessed using course grades. Since the purpose of our study was to examine the overall effectiveness of CLAD in terms of student achievement, we did not focus on specific aspects of the CLAD process in this research. Thus, students in CLAD classrooms had more assignments than students in the traditional or hybrid classrooms. In addition, students completed attitudinal surveys assessing their perceptions of the CLAD process, collaborative learning, and the effectiveness of common classroom teaching techniques.

The steps involved in CLAD are as follows:

1. Students are provided with an Anticipation Guide (AG) which is an advanced organizer consisting of a series of true/false items designed to direct the student's reading and compare his or her pre-reading assumptions and experiences with the text information. Individual students make predictions about the text then mark their predictions on an (AG) before they do the reading.
2. Students confer with their group and come to consensus on the probable answers to the AG items also prior to reading the text.
3. Students then go home and individually read the text, indicating on the AG where they found evidence supporting or disconfirming the question.
4. At the next class meeting, students complete and submit an individual quiz on the reading.
5. After the individual quiz, students break down into their small groups to go over the AG and reach a consensus on the correct answer for each item and the location of the evidence.
6. At the next class meeting, the class comes back together and discusses the anticipation guide. The class works together to reach a consensus on the correct answers for each of the items. During this time the instructor does not give the answers to the class, but merely acts as a discussion facilitator.
7. Finally, the groups take the group quiz on the reading. All members of the group receive the same score. Group members must reach a consensus before choosing an answer. Any disagreement allows for constructive conflict. Answers are marked on an immediate feedback quiz using color changing markers. This quiz is precoded by the instructor such that the correct answer is evident by a certain color, and incorrect answers are indicated by a different color. Students are allowed to continue trying to get the answer correct, although for a lower number of points. For example, the question is worth 3 points if answered correctly the first attempt, 2 points for the second attempt, 1 point for the third attempt, and no points for the final attempt if a 4-choice format is being used.

Overall, the self-correcting group quiz is at the heart of CLAD. Bloom (1976) asserted that corrective feedback is important to academic achievement. Students need to know how to correct themselves as they learn. The instructor's role in this process is to make sure that there is equal participation, debate, and discussion towards consensus and mutual understanding. The instructor also acts to provide guidance when consensus is not possible, or to encourage further discussion when the students are incorrect.

In courses with a combined CLAD - hybrid format, individual aspects of the CLAD process were completed online by students through Blackboard. For example, students went on to Blackboard to get the anticipation guide and to take individual quizzes. In straight hybrid formats students went online to complete chapter quizzes and critical thinking assignments.

Results

In order to ascertain the effectiveness of traditional classroom methods, CLAD, and Hybrid formats, an ANOVA was performed with pedagogy as the independent variable and student achievement as the dependent variable. Student achievement was measured with final course grades. Because

unequal group sizes often affect the ANOVA assumption of homogeneity of variances, Levene's test of homogeneity of variance was computed, The test was not significant at the .05 level, indicating that the ANOVA's homogeneity of variance assumption had not been violated Cell means and standard deviations can be found in Table 1.

Table 1
Means and Standard Deviations for Type of Pedagogy and Student Achievement

Pedagogy	*N*	*M*	SD
Child CLAD Hybrid	38	91.26_{b}	11.37
Child Hybrid	14	88.01_{ab}	19.35
Traditional Child	14	81.33_{a}	11.61
Child CLAD	28	92.88_{b}	5.93

Note: Means with different subscripts differ significantly.

The effect of pedagogy was statistically significant, $F(3, 91) = 3.82$, $p < .05$. Tukey post hoc analyses were performed to identify specific differences in student performance across the various pedagogies. The traditional classroom method was significantly less effective than the combination CLAD - Hybrid classroom ($p < .05$) and the CLAD classroom ($p < .01$). There were no significant differences between student performance in the CLAD, Hybrid CLAD, or Hybrid classrooms.

In each course students were asked to fill out a survey assessing their impressions of the effectiveness of collaborative learning and traditional classroom methods. Most students in the CLAD classrooms rated various aspects of the CLAD format (e.g., anticipation guides, individual quizzes, and weekly group quizzes) as either effective or very effective in terms of their learning (See Table 2). In addition, students in the Hybrid class rated online quizzes as effective or very effective in regard to their own learning (90%) as did students in the Child CLAD Hybrid class (96.4%).

Table 2
Participants Ratings of Effectiveness of Collaborative Methods

	Collaborative Method		
Pedagogy	Anticipation Guides	Individual Quizzes	Group Quizzes
Child CLAD	96.4%	96.4%	89.2%
Child CLAD Hybrid	100%	96.4%	100%

Note: Participants ratings of effectiveness are depicted here as the percentage of participants rating the collaborative method as either effective or very effective.

Discussion

Students in CLAD and Hybrid formats, or a combination of the two, performed significantly better than students in a traditional classroom. It would appear that the use of collaborative methods in the classroom promotes student achievement. The introduction of a hybrid format also seems to enhance student achievement. In addition, students in CLAD classrooms felt that collaborative teaching methods were highly effective in enhancing their learning. The use of online quizzes was viewed by students as an effective method of instruction in the hybrid classrooms.

Future work is needed to determine the conditions under which the CLAD process is most effective. The classes in this study were all Child Development courses. It would be useful to know whether or not students respond to CLAD and combined CLAD - hybrid formats in other courses. Our next study will examine this question in Adult Development classroom.

Study 2: Adult Development

The results of study 1 indicate that CLAD and combined CLAD - Hybrid formats are beneficial in terms of student performance. In addition, it seems that the majority of participants believed that the use of CLAD and CLAD - hybrid methods were effective in enhancing their own learning. As the courses in the previous study were child development courses, the authors believed that it was important to verify that the CLAD and the hybrid formats would lead to the same outcomes in a different course. Study 2 will examine the CLAD and CLAD-hybrid formats in two adult development courses taught in two separate academic terms.

Method

Participants

Study 2 participants were students enrolled in Adult Development courses in the spring and summer quarters of the 2006-2007 academic year. The first sample consisted of 11 students (mean age = 24) enrolled in a CLAD Adult Development course. All participants were White and most participants were female (73%). The second sample was comprised of 17 students (mean age = 29) enrolled in a CLAD Hybrid Adult Development course. Again, all participants were White and the majority were female (89%).

Procedure

Participants were enrolled in one of two Adult Development courses taught by the first author during the spring and summer quarters of the 2006-2007 academic year. The courses differed only in terms of their pedagogy (method of delivery). The CLAD procedure described in Study 1 was used in the spring quarter Adult Development course. Students used anticipation guides and were evaluated with individual and group quizzes. The summer quarter Adult Development course also used the CLAD pedagogy but with a web-based component. As described in Study 1, students obtained their anticipation guides online through Blackboard. Individual quizzes were taken online, and students had online critical thinking assignments to complete. Students in both courses were evaluated with the same number and type of

assignments as both courses were taught using the CLAD method. Student achievement was assessed through course grades. Surveys were administered to ascertain students' perceptions of the effectiveness of collaborative learning and hybrid teaching methods. Students were also surveyed regarding their attitudes towards collaborative learning at the beginning and end of the CLAD-hybrid course in order to see if their experiences with CLAD had changed their perceptions of collaborative learning.

Results

Because unequal group sizes often affect the t-test assumption of homogeneity of variances, Levene's test for equality of variances was computed. The test was not significant at the .05 level indicating that the homogeneity of variance assumption had not been violated. A comparison of the courses revealed that the CLAD-Hybrid students performed significantly higher than those in the CLAD course (M = 97.4, SD = 2.85 versus M = 93.9, SD = 5.22; t (27) = 2.33, p = .03, d = .832). It would appear that the addition of a hybrid format increases the effectiveness of the collaborative classroom. Students in both courses rated collaborative methods as either effective or very effective (See Table 3). Likewise, most students in the CLAD Hybrid classroom felt the use of online quizzes was effective in terms of their learning (82.3%).

Table 3
Participants Ratings of Effectiveness of Collaborative Methods

	Collaborative Method		
Pedagogy	Anticipation Guides	Individual Quizzes	Group Quizzes
Adult CLAD	100%	91%	90.9%
Adult CLAD Hybrid	94.1%	94.1%	88.2%

Note. Participants ratings of effectiveness are depicted here as the percentage of participants rating the collaborative method as either effective or very effective.

In the CLAD-Hybrid course, students reported more positive attitudes toward collaborative learning at the end of the course (see Table 4). Specifically, at the end of the course students believed collaborative methods improved their grades and their attitudes towards the course.

Discussion

Study 2 investigated student academic performance in CLAD and combination CLAD Hybrid courses. The authors wanted to explore whether CLAD and combined CLAD - Hybrid formats would enhance student achievement in Adult Development courses as they had in the Child Development courses in Study 1. Of course, the Adult Development courses in Study 2 differed in terms of course content from the Child Development courses Study 1. However, students were required to complete the same number and type of assignments in each course. Student performance measured in terms of course grades appears to be high in both of these formats. However, unlike in Study 1, the combination of the CLAD and Hybrid formats was superior to CLAD alone. It is unclear why the CLAD-Hybrid format was superior to the CLAD format alone in Study 2. Future research will need to address this issue.

Table 4
Average Difference Scores Showing the Effects of CLAD on Attitudes toward Collaborative Learning

Classroom Experience Survey Items	*M*	*SD*	*T*
My grades improve when I participate in cooperative group work in class.	0.65	1.10	3.44*
Collaborative learning leads to decreased class productivity because group members socialize more and do not stay on task.	0.67	1.34	2.86
Self-esteem of struggling students suffers in collaborative learning activities.	0.59	1.26	2.73
I have a more positive attitude about a class when I work in cooperative learning groups.	0.56	0.82	3.96*
Collaborative learning results in more advanced students being "held back" by the presence of slower learners in a given group.	0.47	1.16	2.37
Group work causes students to be less dependent on the teacher.	0.21	1.30	-0.93
Collaborative learning improves peer relations among students of different ability levels.	0.06	0.98	0.35
I am more likely to consider conflicting or alternative points of view during collaborative work.	0.50	1.05	2.77
Collaborative learning does not allow me to think as deeply as I might on my own.	0.32	0.91	2.07

Note: N = 31-34. Means represent the difference between the post score and the pre score on each item.
* $p < .0033$; *p*-values were subject to a Bonferroni correction because multiple *t*-tests were computed.

Study 3: Child and Adolescence

Studies 1 and 2 were based on a series of courses taught by one instructor. Study 3 was conducted to determine if the effectiveness of CLAD would remain if used by a different instructor teaching a third course in a block format. It is based on the results of three Child and Adolescence courses taught by the second author over three consecutive summer sessions. One was a traditional course emphasizing class discussion led by the instructor, the second was a hybrid format, where the in-class portion was discussion based, and the on-line portion centered on interaction through the discussion board of Blackboard. The hybrid-CLAD course combined the essential elements of CLAD as discussed above into the hybrid format.

Study 3 differed from Study 1 and Study 2 in the following important ways. First, each class was taught in a 4-hour block twice a week. This provided an opportunity to extend the CLAD procedure to a less typical course format. To accommodate this course format, several steps of the CLAD process were combined into a single course session. Second, given the positive outcomes associated with CLAD in Study 1 and Study 2, we wanted to examine whether incorporating as many elements of the CLAD process itself into the on-line portions of the course would lead to favorable outcomes. We wondered whether it was possible for students to become engaged in group work, and reach consensus when not meeting face to face. Third, none of the participants had any prior exposure to CLAD. Thus student reactions would be based on this class alone, and prior expectations could not affect the results.

Method

Participants

Study 3 participants were students enrolled in Child and Adolescence courses during three consecutive summer sessions. The first sample consisted of 17 students enrolled in a traditional Child and Adolescence course. Fifteen of the participants were female, 15 were White, and 2 were African American. One participant was unable to complete one of the exams and was dropped from further analyses. The second sample was comprised of 21 students enrolled in a CLAD Hybrid Child and Adolescence course. Sixteen of the participants were female, 17 were White, 3 were African American, and 1 was of Hispanic decent. One student stopped coming to class, and one failed to complete the CLAD portion of the course. Both were dropped from subsequent analysis. The third sample was smaller, and consisted of 9 students enrolled in a Hybrid Child and Adolescence course. Seven participants were female, 8 were White, and 1was African American (see Table 5 for additional demographics).

Table 5
Demographics

	Age				
Course	*N*	*M*	*SD*	*Mdn*	Range
2006	17	36.71	14.26	27.00	22-64
2007	21	32.29	11.87	27.00	20-59
2008	9	22.67	3.97	21.00	19-32

Procedure

The primary pedagogy in the traditional Psychology of Childhood and Adolescence course was a discussion based format, led by the instructor. Students individually completed 3 exams and a major term-paper.

In the CLAD - hybrid course, the CLAD process followed that discussed in the Study 1 with the following exceptions. First, paralleling the hybrid course, for 33% of the class sessions, students completed all portions of the class on-line, utilizing Blackboard. Specific to CLAD, students were required to work together through a discussion board to reach a consensus on the AG's, and to complete the group quiz. The quizzes were set up such that the individual quiz had to be completed before the group quiz would become available. Second, instead of completing the individual quiz before having the class reach consensus on the anticipation guide, the steps were reversed. This alteration in the procedure was used as a mechanism to reduce the possibility of students studying and learning material that was incorrect. By reaching consensus with the class prior to taking the individual quiz, students may have been able to correct any misperceptions they had prior to answering quiz questions. Third, because the group quizzes were taken on-line, there was no opportunity for the use of color-change markers, nor the ability to correct an incorrect response for lesser credit. Fourth, during the in-class sessions, steps 4, 5, 6, and 7 (as described in Study 1) were combined, such that in a single class session, students reached a consensus on the questions presented on the anticipation guide, completed an individual quiz, and completed a group quiz which allowed for immediate feedback and correction.

In the hybrid version of the same course, which is based on a traditional course delivered partially on-line (with no CLAD components) students were assigned 2 exams, three quizzes covering the material they were primarily responsible for during the Blackboard sessions and a major term paper. Approximately 33% of the class was entirely on-line, through Blackboard. To maintain the focus on discussion, students in the on-line course were expected to respond to a series of questions posted on Blackboard. In addition, they were required to respond to each other's posting. In total, each student was graded on 30 postings.

Replicating Study 1, students were also surveyed regarding their attitudes towards collaborative learning at the beginning and end of the CLAD-hybrid course in order to see if their experiences with CLAD had changed their perceptions of collaborative learning.

Results

Results were analyzed with two different dependent variables, final grade based on all points and final grade based only on exams and quizzes. Because unequal group sizes and small group sizes can both impact the assumption of equal variances, Levene's test of the homogeneity of variances was conducted. When assessing grade based on all points, groups had equal variances (Levene = 3.137, $p > .05$). An ANOVA of the three courses revealed a significant effect of course type, whether the performance criteria was overall course grade, $F(2, 41) = 4.33$, $p = .02$, or average grade based solely on tests and quizzes, $F(2, 41) = 5.46$, $p < .01$. Tukey follow-up tests indicated that students in the CLAD-hybrid course outperformed those in the hybrid course (See Table 6).

However, there was heteroscedasticity in the data when analyzing grade based only on tests and quizzes (Levene = 4.93, $p = .012$). To account for this, Welch's test was used

Table 6
Means and Standard Deviations for Type of Pedagogy and Student Achievement

		Overall Grade		Exams and Quizzes	
Pedagogy	*N*	*M*	*SD*	*M*	*SD*
Traditional Child	16	84.03_{ab}	9.30	79.72_{ab}	13.30
Child CLAD Hybrid	19	88.53_{b}	6.10	86.03_{b}	6.55
Child Hybrid	9	80.16_{a}	5.89	73.43_{a}	7.13

Note. Means with different subscripts differ significantly at $p < .03$ in the Tamhane post-hoc comparison procedure.

in the place of the standard ANOVA. Results indicated a significant effect of course type when grade was based solely on tests and quizzes, F (2, 20.65) = 10.00, p = .001. Tamhane post-hoc tests, which do not assume equal variances, indicated that students in the CLAD-hybrid course outperformed those in the hybrid course (See Table 6). Overall course grades in all three courses were derived from differing numbers of assessments. Due to its nature, the CLAD method requires more assessments than a traditional classroom. The purpose of our research is to examine CLAD as an overall process not the various aspects of CLAD. We are not concerned with whether or not the specific assessments enhance learning, but whether CLAD as an overall process is conducive student academic performance.

Examining the change scores for the attitude items listed in Table 4, consistent with Study 1, students reported a significant increase in positive attitude about a class when working in cooperative learning groups. However, there were also significant increases in the belief that collaborative learning leads to decreased productivity because of group socialization and not staying on task, that more advanced students feel "held back" by the presence of slower learners in a group, and that collaborative learning does not allow one to think as deeply as he or she might alone (all p's < .0033 due to Bonferonni correction for multiple t-tests; see Table 4 for details of item wording).

Discussion

Although the small size of the third sample reduces generalizability, the results are promising. As hypothesized and consistent with Study 2, the CLAD process led to enhanced student performance when used in a hybrid course compared to a traditional hybrid class. Although the same portion of the course covering the same material was on-line in the hybrid version of the class, students were not part of an interdependent group. The quality of the posts indicated a lack of connection among students. In the CLAD-hybrid version, the posts tended to take on a dialogue among the students, an aspect that was lacking in the hybrid version of the course.

From the instructors' point of view, students were more engaged in both the traditional course and the CLAD-hybrid course. Further research will be needed to address the similarity in performance when comparing the traditional pedagogy and using CLAD in a hybrid format.

While the attitude items indicated an increase in positive attitude toward the class, perhaps indicating greater enjoyment with the course, students also reported increases in undesirable aspects of collaborative efforts, including less productivity, feeling held back, and less critical thinking. Because the CLAD method appears to improve course performance, and perhaps overall attitude toward the course, future research will have to examine the negative effects of collaborative efforts. For the majority of students this course was their first exposure to extensive collaborative learning. They may have experienced a group project in other courses, but apart from the on-line portion of the course, the entire course was built around the collaborative efforts. As students gain experience in collaborative learning, and begin to assume responsibility for their learning, perhaps the undesirable attitude changes we observed will decrease.

General Discussion

Overall, the results of our investigation support the benefits of the using the CLAD procedure in college level developmental psychology courses, although the hypotheses were not fully supported. The primary study demonstrates that the traditional mode of lecture led to the poorest level of student performance, in partial support of the first hypothesis. The second hypothesis received support from both Studies 2 and 3, where student performance was better in the CLAD - hybrid course compared to the CLAD traditional course. The third hypothesis only received partial support from Study 3, where students in the CLAD-hybrid course outperformed those in the hybrid course, but did not differ significantly from students in the traditional course.

Across these three studies, inconsistencies regarding the effectiveness of each pedagogy are evident. However, in no instance did a traditional format lead to better performance as compared to a course based on CLAD. This suggests the need for further analysis of the CLAD process. As an alternative teaching pedagogy, it does not appear to have any negative impact on student performance as assessed by two instructors comparing nine separate courses. The results support previous research (e.g., Johnson, Johnson, & Smith, 2007) indicating that students enhance learning when working in active groups versus passive learning. The results of prior research by Fitch and Hulgin (2007), who found the CLAD method to be effective in K-12 settings, were also supported.

Holding student performance constant, is there value to collaborative methodologies such as CLAD? On attitude measures, students reported positive attitudes toward the major components of the CLAD procedure, the anticipation guides and the group quizzes. Across 2 studies, students also reported an increase in having a positive attitude toward the class when working in collaborative learning groups.

Future research could also examine what else students might be learning in these collaborative sessions, other than

course content knowledge. In many instances, the students act as a teacher to peers who are having difficulty with a concept. Does this enhance their level of understanding of the material, perhaps in a manner that is not evident in many exams?

Although there were increases in positive attitudes toward collaborative learning, the results also suggest that there may be some risk involved. Some students reported that the collaborative methods utilized in the CLAD procedure led to decreased class productivity, and that more advanced students were being held back in a group setting. However, the negative attitudes toward CLAD may disappear in time. In Study 1 and 2, some of the students had been exposed to CLAD in prior classes, and the reactions toward CLAD were positive. Study 3 differed in that no student had any experience with the CLAD procedure prior to this course. From the subjective view of the instructor, as a whole the class expressed resistance during the initial description of the CLAD process. It is a major shift for students to adapt from viewing education as content that is delivered via an instructor, and being forced to accept primary responsibility for learning material. Perhaps with time the resistance diminishes as students see the effectiveness of this methodology. While increasing negative attitudes toward collaborative learning is a risk, it may be worth taking, given the increase in student learning, and the overall positive attitude toward the CLAD process.

Limitations

There are a number of limitations to this study. The primary limitation is that all courses were taught by two of the authors of this study, both of whom were aware of the research hypotheses. Thus, we could have unintentionally influenced our findings. Although the authors were aware of the purposes of the study, by having one instructor teach all courses within a given study, variables associated with the instructor and his or her personality are held relatively constant. Thus, individual difference variables do not affect the results of the study. We believe this to be more beneficial than having courses taught by different instructors. Realistically it was not possible to remain unaware of the purposes of these studies. One cannot attend a conference on teaching (such as the National Institute on the Teaching of Psychology) and avoid presentations on the effectiveness of collaborative learning, or on the outcomes of on-line learning. Some of the students taking the courses in these studies were education majors, who are also taught the benefits of collaborative learning. The ideal situation of a double-blind study was not possible. However, we felt the importance of determining whether CLAD was an effective means of education in a collegiate setting outweighed this limitation.

Second the number of assignments and quizzes was not held constant within each course within each study. Because research has shown that repeated quizzing can lead to improved test performance (; Dustin, 1971; Gaynor & Millham, 1976; Rohm, Sparzo & Bennett, 1986)), this is an alternate explanation for some of the results (we would like to thank an anonymous reviewer for identifying this limitation). However, the purpose of this article was to compare the effectiveness of courses taught using CLAD to those taught in a hybrid or a traditional format. The CLAD procedure has many more quizzes built into it compared to a traditional, exam based course. In addition, the reading guides are not a part of either of the other course formats. Our intent was not to determine which aspect of CLAD is effective. We needed to determine if a process that has not been used in college-level psychology courses was sufficiently effective in an overall manner to warrant further research. Given our results, we feel it is, and are planning an additional series of studies to isolate the aspects of CLAD that are most effective.

Third, we were unable to randomly assign students to condition, in part due to the size of the institutions involved. No more than 2 identical courses could be taught in a given semester, and summer sessions were further limited by enrollment. Second, there are technological issues surrounding any on-line classes that cannot always be anticipated. Servers can malfunction, and internet server providers can also fail to function properly. Attempting to have students interact as a group on-line, in a synchronous manner, not simply the asynchronous nature of a typical Blackboard discussion poses additional problems. Because students were using different methods of connecting to the internet from home, including dial-up connections and high speed cable connections, lag times for group responses caused enough trouble for one group that they chose to meet together as a group instead of interacting on-line. In addition, when doing classroom research it is difficult to coordinate equal class sizes, therefore there is variation among groups. Finally, these results can only be generalized to predominately White college settings and follow—up studies are needed to see if similar results are evident with more diverse samples.

In spite of these limitations, our results suggest further research is warranted to better clarify the conditions under which CLAD is most effective. It appears that this collaborative method is superior to traditional instruction methods used in many collegiate courses, and can be applied to both face to face and hybrid classes. Whether the technique could be adaped to a completely on-line or distance format where all of the collaboration would take place in cyber space could also be explored. If further research supports these findings, the implications for education are substantial, and may lead to better teaching methods, and improved student learning.

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