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## **A Learning Community's Potential Academic Impact: A Qualitative Analysis**

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### **Abstract**

*Learning Communities (LC) in higher education can serve as powerful connectors among individuals, particularly when integrating minority and White students. We conducted 24 in-depth interviews, using qualitative research methodology, with the 2004 cohort of LC students from a private, selective, Midwest university. Seniors at the time of interviews, the students reflected on their perceived outcomes of their freshman LC experiences. Elsewhere (Firmin, Warner, Johnson, Firebaugh, & Firmin, 2009a), we reported that participants showed the experience to hold a cogent social purpose, with many members recounting memories with a sense of positive nostalgia. We also reported attitudinal outcomes of the participants LC experience, with members' shifts in biases, level of satisfaction, and factors related to involvement (Firmin, Warner, Johnson, Firebaugh, & Firmin, 2008b). Present findings discuss the academic experience of members who participated in the LC program. Students reported that the social functions of the LC supported academic activities and learning. Students also developed relationships with the professors, and many viewed the instructors as being influential mentors.*

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University administration and faculty report desiring to promote and increase diversity across college settings (Challenger, 2004). Learning Communities (LC) are relatively recent programs aimed at contributing to this objective. A LC is a group of students who interact in formal programming for a specific purpose in academic and social situations. There are various types of LCs, such as those focused on particular subject matters or commonalities among students. A key aspect of most LCs is the opportunity for networking and social support (James, Bruch, & Jehangir, 2006). Thomas (1993) reports that the freshman year of college is a critical time for students to construct a strong academic foundation. LCs are a potential venue to help create that firm foundation.

One specific type of LC focuses particularly on multi-cultural issues. These may be especially beneficial at colleges with a primarily mono-racial or mono-cultural student composition (Park, 2009). The goal of multi-cultural LCs is to enhance the diversity opportunities available at the institution. Students are placed in cohort groups that interact in academic environments, such as classes, as well as in social activities (Tosey & Gregory, 1998). Cross (1998) found that close cohorts can create a more holistic learning environment for some students. A major challenge facing school administrators is retention, and minority student attrition can pose a particular difficulty for some institutions. LCs have been shown to increase college retention rates (Hegler, 2004).

Research shows that LCs offer certain benefits to students. For example, Zhao and Kuh (2004) reported that learning groups can foster heightened academic achievement and the sense of personal self-gains in students involved in a learning group. Students also reported the existence of an enhanced positive atmosphere at their institution. Zhao and Kuh also found that the organization of LCs fostered increased interaction and the development of social relationships with peers and faculty that likely would not have occurred without the LC structural framework. Cox (2004) found positive results when LCs were administered with appropriate sensitivity. Minority students can benefit from the academic integration into the college or university through LC participation. This is particularly important since Eimers and Pike (1997) reported that minority students tend to receive less overall external social support than non-minority students.

LCs can encourage educational gains as well. Chung and Sedlacek (1999) reported that a diversified student environment promoted learning in their sample. Although parents' cultural attitudes and beliefs affect students' perceived value of academic achievement, LCs can offer a nurturing learning environment that enhances the fulfillment of individual and group goals (Roach, 2004). LCs also have been shown to promote social and attitudinal benefits (James, Bruch, & Jehangir, 2006). Stereotypes may be lessened and critical thinking skills can be developed in diverse social and educational environments through LC participation (King, 1999). Minority and non-minority students reported, in a study by Meacham, McClellan, Pearse, and Greene (2003), that a diversified classroom provided opportunities for discussing challenging topics and gaining cultural awareness. Caucasian students with more diverse life experiences have demonstrated higher interests in understanding the perspectives of others. These students also showed an increased desire to pursue a graduate degree (Roach, 2004). The social impact of LCs is salient since freshman students may use LCs as social resources. For example, Jalomo and Rendon (2004) indicated that students who participated in LCs were able to meet others with whom they otherwise would not have interacted. Connecting with people from different

ethnicities also can promote cultural awareness and leadership skill development (Antonio, 2001).

In sum, research suggests potential benefits available for students who participate in LCs. Consequently, we sought to determine if the 2004 pilot year of a LC at a selective, private, Midwest university would provide these boons implied in the research literature. In order to allow the individuals free reign in expressing their experiences and opinions of success or failures of their cohort, we followed the construct of qualitative methodology. These students were seniors at the time of interviews, and they reflected on their experiences of the LC when they had been an active member. They also were asked to note perceived lasting effects of their participation, if any. We believe our findings will enhance the understanding of students' reactions to interacting in a LC—providing potential insights for future LC directors.

The purpose of the present undertaking was to generate a phenomenological, qualitative research study. The intent of this paradigm is to explain experiences and understandings of a construct from the viewpoints of the individuals who undergo the activities (Cope, 2004). It is exploratory, by nature, and researchers report inductively—relating what the participants report—rather than searching deductively for anticipated findings. Consequently, here we report the two findings that participants consistently and repeatedly related vis-à-vis their freshman year LC experiences.

## **Method**

### ***Participants***

The members in this study were students at a private, selective, comprehensive Midwest university of the United States, with an undergraduate student enrollment of slightly over 3,000. Grant funding during the 2004 pilot year of the LC made the LC study possible. The university is primarily Caucasian, with only approximately 6 % population being minority. Of the original 42 freshman students placed in the LC, we interviewed 24 individuals, 14 female and 10 male. Due to the purposeful multicultural nature of the LC, there was a variety of ethnicities and cultural backgrounds. These included Asian, Hispanic, Caucasian, Multi-Racial, and African-American. Thirteen of the students reported moderate to high levels of involvement, two rated themselves at medium-level participation, five described low involvement, and three were not involved (although they were placed in some of the same classes with other LC students, this obviously did not guarantee a personal commitment to LC participation). Faculty who were directly involved with the LC program contacted students in order to inform them of the students' freshman LC status, primarily through phone calls. A letter was also sent to their respective homes prior to students arriving on campus.

### ***The University's LC Program***

The purpose of the LC was to create a diverse, multi-cultural environment for in-coming freshmen. The goal was for students to be able to socially network with other students and receive mentorship from involved faculty. Four professors were involved in teaching classes, consisting of primarily LC students. The students who were in the LC program also participated in social events and bi-monthly group meetings. The LC students were primarily placed in four general education courses (two per semester) with other LC members. Some courses consisted exclusively of LC members (e.g., their Speech class). Students would gather for extracurricular activities such as bi-weekly group meetings, dinner at a LC-involved professor's house, and a

field trip to a museum. The bi-weekly meetings were loosely-structured and typically included an educational or culturally-relevant activity. The LC class divisions and structured activities existed during the school year of 2004-2005 and officially terminated with the start of the students' sophomore year.

### ***Data Collection and Analysis***

Tape-recorded, semi-structured interviews (Sideman, 2006) with the LC members were conducted during the spring 2008 semester and later transcribed for analysis. The semi-structured format allowed for flexibility when interviewing participants. Participants could take the interview different directions, elaborating on various points, relating stories and sharing personal accounts. We believed this best would provide rich-and-thick descriptions of students' percepts regarding their previous LC experiences. All participant names have been changed to pseudonyms to protect the privacy of professors and students involved. This present study was designed to be a phenomenological research study. Our aim was to garner LC members' views of their experience from three years prior. The primary research question involved exploring memories, feelings about their involvement, and any perceived potential academic benefits of the LC participants.

Using Maxwell's (2005) protocol, we implemented an open coding process. We followed an inductive approach where we arrived at general, over-arching themes from broad statements from the data. The research team collaborated repeatedly in coding the data and generating potential themes. Constant comparison techniques (Bereska, 2003) were utilized in coding the responses from the participants. We contrasted and matched the responses from the interview transcripts, assessing recurrent constructs in the transcripts. Consistent themes that were supported and repeated by most of the participants were kept; those that were not repeated were later discarded (Marshall, 2002). The process of moving from coding the data to thematic analysis involved organizational review, concept mapping, visual displays of findings, and asked key questions (Gay, Mills, & Airasian, 2008).

Qualitative researchers often approach the notion of theory with different perspectives. Some advocate that theory should be embedded into the research design and analysis of the findings (Guba & Lincoln, 2004). Others, however, recognize the potential drawbacks of this approach and, instead, indicate that qualitative research best should be atheoretical in design and analysis (Johnson & Christensen, 2004). In this paradigm, it is the role of the reader, not the researcher to use theory when reading a research article. Naturally, we will not solve this long-term debate in qualitative circles—but we explicitly state our long-term held position of not using theory in qualitative research design or interpretation. This is stated here to assure the reader that its lack of use in the methods and discussion section of this article is not an oversight. Rather, it is deliberate and follows a protocol for a legitimate means of conducting qualitative research methodology (Cresswell, 2007).

Internal validity for our findings was strengthened in a number of ways. Consensus among the multiple researchers provided checks and opportunities to consider alternative explanations for potential findings (Silverman, 2006). Consensus was reached among the authors regarding the themes we report as being representative of the participants. In addition, an outside qualitative researcher uninvolved in the data collection appraised the methodology and conclusions (De Wet & Erasmus, 2005; Merriam, 2002). We also generated a data trail

(Armiknio & Hutgren, 2002; Daytner, 2006), connecting each reported theme to the data in the transcripts. NVIVO-8 software was useful in the coding process, especially in creating the data audit. Particularly, grounding of our findings to specific quotations was enhanced by this computer software.

Member checks also were utilized in order to strengthen internal validity (Padgett, Matthew, & Conte, 2004). Participants related that the overall findings were congruent with their own sentiments and perspectives. Saturation (Neuman, 2006) occurred in the data collection and analysis. Specifically, after around 20 or so interviews, we found the ideas and themes of the participants were relatively consistent. New individuals added to the research sample resulted in diminishing returns. Consequently, we believe that the 24 participants in this research study were sufficient and consistent with sound qualitative methods protocol (Guest, Bunce, and Johnson, 2006). In sum, we sought to create a research study that possessed rigor and fit the traditional qualitative research design (Cope, 2004, Morse, Barrett, Mayan, Olson, and Spiers, 2002). Internal validity was an emphasis throughout the whole process, from inception to finalization.

## **Results**

We identified three themes representative of the data provided by the LC students: social outcomes, attitudinal outcomes, and academic outcomes. Previously, the current authors (Firmin, Warner, Johnson, Firebaugh, & Firmin, 2008; Firmin, Warner, Firebaugh, Johnson, & Firmin, 2008) presented findings that related to LC's social and attitudinal outcomes experiences. Students reported that the primary motivator for their participation in the LC was for social reasons. Social outcomes included student participation in further multi-cultural and diversity-oriented campus activities. The attitudinal outcomes related students' shifts in biases and stereotypes, their decisions to become involved, their levels of satisfaction, and suggestions for future learning communities. The present article focuses particularly on the academic outcomes of the multi-cultural learning community. Two salient academic themes that emerged from the data: academic support issues and interaction with the faculty.

### ***Academic Support Issues***

A cogent theme in the data showed that social support in the LC benefitted students academically as well. Particularly, the participants reported that the social ease and healthy relationships they experienced in the LC promoted learning. Students indicated that they felt comfortable in the classroom among their peers and instructors and they enjoyed interacting with familiar faces in the classroom setting. Jason stated: "You feel more comfortable around people that you spend more time with." This was said to encourage students' involvement in class activities and discussions. Dominique expressed: "I liked it a lot, having somebody that you're comfortable with that you can just say something to, something that you're thinking." Adjusting to any new milieu, including the first year in college, can be stressful. Further, stress often interferes with optimal learning. LC participants indicated that, by engaging socially with familiar people, they felt more at ease and they experienced better social support. Marcus shared sentiments similar to most LC participants we interviewed:

It made them a lot more fun because we were all just comfortable with each other. So socially classes were just fun and we enjoyed them. Academically, it was nice. I wouldn't say it made the course work easier, but it was nice just to be able to bounce ideas off of

each other or remind each other of when things are due, or to work together on projects. So it helped in that regard.

Students felt comfortable sharing their thoughts and opinions with others, free of some common freshman hindrances such as the unfamiliarity of others and formality in the classroom environment. Taylor shared that he felt “relaxed, and I felt like I learned more just from the aspect that we all felt comfortable to ask questions, and discuss real issues. We talked about real things going on instead of just the typical....more like experiential, like learning in the process in the classroom together.” Familiarity does not always breed contempt. Sometimes it helps to ground students so that they possess bearings with familiar people. Dinah expressed: “It was nice when we went from one class to the next with like, ‘Oh yeah, you’re going to be in this.’”

Students gained friendships from being in the same classes with others in the LC. These relationships were a form of social and educational support in larger classes. Shaela expressed “some of the classes I was with people from the Learning Community and those were typically my closest friends in those classes... With those big classes, it helped to give it a little more of a personal, relational-based feel, instead of just a teacher-student type thing.” Jason shared similarly: “The biggest thing I remember and to this day still is it helped me to form a lot of friendships. So that was probably the biggest thing.” This familiarity with peers increased student’s comfort and, ultimately, provided them a more optimal learning environment.

Students reported that they were more apt to study together outside of class than what they were likely to have done otherwise. Jason elaborated: “I definitely met a lot of people through classes. Because we all had the same classes together, I felt like more comfortable being willing to study outside of classes, things like that. So it helped me academically too.” The relationships gendered in the LC experienced were indicated to have made connected study more likely. The peer-helping behaviors that resulted were said to have been useful. Ruth, for example, commented: “It was good to have people to study with, and you know college is totally different than high school (laughs) and so figuring out how to do papers and stuff like that. It’s definitely helpful to have people to work with and people who you are comfortable with.”

Students reported that their classes were more enjoyable because of the social relationships they had with their peers. They appreciated students in class who eventually became their friends. Students seemed to especially enjoy the Speech class, due to the reportedly pleasant and fun atmosphere created by the instructor (Dan), and the fact that they were friends with people in the class. Jin described: “I think, especially my Speech class, I remember that being like a really fun time. I just felt like no one else has a Speech class like this. It just felt really family-like, so therefore, like I said, it just made me feel more comfortable to do things outside of the classroom and, you know, we’d eat lunch together, and stuff like that.” The LC seemingly provided a microcosm, of sorts, for LC students where they felt some level of bonding—and that was to aid their overall academic experience. For students in our sample, affective and cognitive variables intertwined. Tiffany commented: “I think it (the LC) made Speech easier to take because we all had that common, you know, like ‘Hey, we’re all in the LC.’ We have that common thread, so we’re kind of more comfortable with each other. And Dan made it, you know, easy and comfortable and cracking jokes all the time.”



Participation in the LC also was said to increase certain students' confidence in the classroom. This improved confidence was discussed as if it evidently enhanced students' perceived self-efficacy. Andrea, for example, reported:

I had an increased confidence level in the classroom....The classroom confidence has been major for me. I'm not sure that I should have been involved more than I was or kept up the friendships from the group. I don't regret anything about the way things have gone for me at college as I have grown exponentially since my first day.

Students frequently spoke of feeling better able to face the rigors of academic classes, since they knew the other students and had a shared sense of the challenge before them. For these participants, LC participation seemingly enhanced their overall positive self-beliefs.

### ***Interaction with Faculty***

A second academic theme found in students' interviews related to their interactions with faculty. Specifically, an important benefit of the LC on which students reflected was the opportunity to work closely with faculty. Students remarked fondly about their professors' influences. Marisol enthused: "I loved all the professors! I feel like I got the best professors in those particular Gen Ed classes and that I got to know many of them better than other students did." Many students bonded and formed close attachments with individual faculty members. They also reported learning life lessons as well that became formative enhancements to their respective freshman experiences. This seemingly became a value-added dynamic to the overall freshman year. Claire shared how her Composition professor shaped her:

I think it was my composition class Dr. Mays was talking about how it's my responsibility to learn. And learning is like a blessing because you can come to class and write down information and whatever and just study and whatnot. But learning is so much more than just getting a good grade. And so she really tried to challenge us to not think of this as just another day at school, another class, but this is an opportunity to learn. And maybe not just in this class, but learn about yourself and learn in life. Because you can learn a lot more than just what you have to write down in your notes. Take initiative, because we're only cheating ourselves when we don't really do our work completely. It doesn't really affect her, it only affects us. That was just something that stuck with me.

Students noted particularly close relationships with some of the faculty members. Students shared how these professors impacted them in multiple ways and across numerous courses. For example, students recalled Dr. Geer's fun, easy-going nature, and his ability to make class time enjoyable. This close, casual relationship was demonstrated by many students we interviewed referring to him by his first name, Dan. Carlita elaborated:

Dan was just a lot of fun. He's a good professor. I'm not a huge fan of writing speeches, but he really did help us a lot. He made it enjoyable, and I don't really talk to him as much now, but freshman year we had a good relationship.

Students similarly expressed admiration and gratitude for the knowledge they gleaned from Dr. Williams, such as Karina who used the phrase "big respect" when referencing her. Jose shared:

I only really knew Dr. Williams, and I've always really liked her actually. She didn't have just one way of looking at things, she always presented different views so I feel like I connected with her; I felt like I understood where she was coming from always.

When students made particular references to Dr. Williams, often they used familial-type words, such as “mothering” and “children.” They seemingly felt the care she demonstrated for LC students’ academic well-being. Latisha described:

And Dr. Williams, of course, she’s just so wonderful and so sweet. I took a class from her because I was like, I miss her. I feel like we’re kind of like her children or something. She just loves us—the LC kids—so much. She’s the one that I’m connected to the most.

Students who participated in the LC shared that they felt a closer connection to the faculty due to the professors’ involvement in the LC. Interacting with professors outside of class enabled the development of closer student-faculty relationships than regular classes provided. Tina expressed:

It made it a lot more fun, and then it was nice too because some classes, like the Speech class, Dan knew these people. Like, it was very obvious that he was involved in the Learning Community, and we were part of it, so that even between the professor and the student, there was another level of interaction that wouldn’t have been possible otherwise.

While evidently maintaining a healthy professional respect for LC instructions, participants indicated that seeing a more 360-perspective of faculty enhanced their comfort-levels of these professors in the formality of the university classroom. Ricky illustrated this point:

I’d say it left for a good relationship with the faculty who were involved because you felt like you knew them outside of the classroom... We would see the different side of the professors than what we would just see in classes or how they acted in classes... So I would say that the relationship with the professors improved because we knew that they were out there to help us. We knew that they were in support of this community and support for what we’re doing. It shows that they care because they’re a part of it and they’re dedicated to it.

Most students initially decided to participate in the LC because a faculty member contacted them. This type of personal interaction persuaded many to explore the LC and become involved. Jason, for instance, described:

The only reason I really did it in the first place was because Dr. Williams called me at my house in the summer before we even got to [the university] and explained the program a little, then asked me to participate. If we went back in time and she had never asked me to do it, I probably wouldn’t have. Or if I would have been contacted via email and randomly decided to go to the first meeting, I probably would have never gone back. I mostly only did it because I felt obligated by Dr. William’s invitation.

Other students echoed Jason’s sentiments and stated that their initial involvement came after contact from a faculty member. Evidently a more personal connection—such as a phone call—was considered more effectual to most of the LC students than less personal communiqués, such as written letters.

LC faculty members also played the role of confidante. LC participants expressed an increased level of trust and comfort toward some of the LC faculty as compared to other faculty. Karina expressed: “It was just a very familiar and comfortable atmosphere. We had a good time, and we still learned.” Students described that they would be more likely to confide in an LC faculty member and discuss issues and concerns. This personal trust and confidence was said to enhance students’ overall freshman experience learning experiences. Carla related this point:

I felt like he (Dan) is a member of the faculty and if I had a problem, he would be the person that I would go to I think. Like I maybe didn't necessarily need that—it's not like I had a problem that I needed someone to go talk to. But it was nice to know that I had someone there that I felt like I could talk to about anything. I thought it was good.

This willingness to confide seemingly was more than just a warm feeling that students had about some LC faculty. Rather, it evidently translated into students letting-down their guards and seeking-out personal contact that otherwise they felt they would not have done.

### Discussion

The finding that social atmosphere was reported to have impacted academics in a LC program corroborates some previous research by James et al. (2006). They reported that learning communities potentially can provide the opportunity for networking and the development of social relationships. Students in the present study, and also James et al's, reported an increased motivation and ease for learning when they felt comfortable with their fellow students and professor. Zhao and Kuh (2004) reported that learning groups promote increased academic achievement. Similarly, in our present study, students reported an increased enjoyment of the learning process. Students generally also felt that the social aspect of the LC experience increased their confidence in the classroom. This finding is similar to Zhao and Kuh's conclusion that learning groups can develop a sense of accomplishment in students.

Most students also described a connection to the instructors. Many of the LC professors were available to students outside of formal class hours and developed relationships with the LC students. This corroborates with Zhao and Kuh's (2004) finding that LCs encourage increased interaction and the opportunity for social relationships with peers and faculty that would not likely have occurred without the LC. Some students recounted how they still felt connected to particular professors. Certain instructors impacted students and shared life lessons along with course material.

A common tie-in between the two academic themes reported in the present study is the construct of relationships. These were shown to be particularly cogent. The participants in the study related that relationships that developed among themselves and also relationships that developed between themselves and the faculty members had lasting effects in ways they still felt three years after the LC experience. The integration of social with the academic is one of the most salient findings of the study. That is, participants seemingly rejected dualist notions of social relationships being one isolated part of their college life and academics being another, separated compartment. Rather, they consistently described the interaction between these two life components. The social aspects of their LC experience integrated into the academic components of their freshmen year.

We believe the findings in the present study have important potential implications for both divisions of student life and also the academic divisions of American universities. Although the two domains typically are operated by different vice presidents and have no organic connection in terms of line and staff operations—results from this study suggest that the two divisions should work in concert. Foster social connections among students—and among faculty—seem to make potentially important differences in how freshmen can perceive their first year college experiences. Both through LCs and also through general student life programming,

academic deans and student life deans would do well to consider how they best can work together in order to seam-together freshmen connections. The cogent dynamics can be tapped and channeled in order to help provide first year students with optimal learning success in the classroom.

### **Limitations and Future Research**

All good research recognizes limitations of a study and reports them (Price & Murnan, 2004). Research regarding LCs can be strengthened with replication of this present study at various types of colleges and universities in different regions of the country. The results may be varied or more profound for institutions with a large student body or with an increased minority student population. In addition, it would be helpful to interview participants of LCs while they are current members of the LC group. A current perspective may provide a different viewpoint than a retrospective one. That is, retrospective feedback of the LC experience may not provide an entirely accurate report in that positive experiences may be exacerbated and negative experiences may be downplayed.

Additionally, these pilot-year students' perspectives may have been influenced by interactions with LC members of subsequent years. Since 2004, every new academic year begins with the creation of a new LC cohort comprised of freshmen. For future research, replicating this study with students in subsequent years may provide insight vis-a-vis improvements in the overall organization of the LC group.

And finally, the results related in the present article reflect mostly the sentiments of those who actively participated in the LC. As noted, there were some students who chose not to participate in the LC experience, although they were members of the LC group. Future research should focus on these individuals and their reasons for not desiring to participate. These results can help assess what might be improved in the program in order to increase the overall yield of participation in the group. Such findings can be implemented into the planning and organization of campus LCs as they continue to improve through integrating empirical data into a continuous improvement feedback-loop.

### References

- Antonio, A. L. (2001). The role of interracial interaction in the development of leadership skills and cultural knowledge and understanding, *Research in Higher Education*, 42, 593-617.
- Bereska, T. M. (2003). How will I know a code when I see it? *Qualitative Research Journal*, 3, 60-74.
- Brower, A. M. (1998, November). What is a learning community? *About campus*, Vol. 3, pp. 15-21.
- Challenger, D. F. (2003). Effectively addressing issues of race on campus. *Black Issues in Higher Education*, 20, 35.
- Chung, Y., & Sedlacek, W. (1999). Ethnic differences in career, academic, and social self-appraisals among incoming freshmen. *Journal of College Counseling*, 2, 14-24.
- Cox, M. D. (2004). Introduction to faculty learning communities. In M. D. Cox and L. Richlin, (Eds.), *Building Faculty Learning Communities*, (pp. 5-23). *New Directions for Teaching and Learning*, San Francisco: Jossey-Bass.
- Cresswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches*. (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage.
- Cross, P. (1998, July). Why learning communities? Why now? *About Campus*, Vol. 3, pp. 4-11.
- Daytner, K. (2006). *Validity in qualitative research: Application of safeguards*. Paper presented at the 18<sup>th</sup> Annual Ethnographic & Qualitative Research in Education Conference, Cedarville, OH.
- DeWet, J., & Erasmus, Z. (2005). Towards rigour in qualitative analysis. *Qualitative Research Journal*, 5, 27-40.
- Eimers, M. T., & Pike, G. R. (1997). Minority and nonminority adjustment to college: Differences or similarities? *Research in Higher Education*, 38, 77-93.
- Firmin, M., Warner, S., Johnson, C., Firebaugh, S., & Firmin, R. (2008a, April). *Learning community's potential social impact: A qualitative analysis*. Paper presented at 5<sup>th</sup> Annual Black Atlantic Community Conference, Wilberforce, OH.
- Firmin, M., Warner, S., Johnson, C., Firebaugh, S., & Firmin, R. (2008b, November). *Attitudinal outcomes of a multicultural learning community experience: A qualitative analysis*. Paper presented at 28<sup>th</sup> International Lilly Conference on College Teaching, Oxford, OH.
- Guba, E., & Yvonna, L. (2004). Competing paradigms in qualitative research: Theories and issues. In S. Hesse-Biber & P. Leavy *Approaches to qualitative research* (pp. 17-38). Thousand Oaks, CA: Sage.
- Hegler, K. L. (2004). Assessing learning communities. *Assessment Update: Progress, Trends, and Practices in Higher Education*, 16, 1-8.
- James, P. A., Bruck, P. L., & Jehangir, R. R. (2006). Ideas in practice: Building bridges in a multicultural learning community. *Journal of Development Education*, 29, 10-18.
- Jalomo, R. E., & Rendón, L. (2004). Moving to a new culture: The upside and downside of the transition to college. In L. I. Rendón, M. Garcia, & D. Person. *Transforming the first year of college for students of color* (pp. 37-52). Columbia, SC: Center for the First-Year Experience and Students in Transition.
- Johnson, B., & Christen, L. (2004). *Educational research: Quantitative, qualitative, and mixed approaches*. Boston: Allyn & Bacon.

- King, P. (1999). Improving access and educational success for diverse students: Steady progress but enduring problems. In C. S. Johnson & H. E. Cheaham (Eds.), *Higher education trends for the next century* (pp. 5-11). Washington, D.C.: American College Personnel Association.
- Maxwell, J. A. (2005). *Qualitative research design* 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage.
- Meacham, J., McClellan, M., Pearse, T., & Greene, R. (2003). Student diversity in classes and educational outcomes: Student perceptions. *College Student Journal*, 37, 627-643
- Merriam, S. B. (2002). Assessing and evaluating qualitative research. In S. B. Merriam (Ed.), *Qualitative research in practice* (pp. 18-33). San Francisco: Jossey-Bass.
- Padgett, D. K., Mathew, R., & Conte, S. (2004). Peer debriefing and support groups. In D. K. Padgett, Ed. *The qualitative research experience* (pp. 229-239). Belmont, CA: Wadsworth.
- Park, J. J. (2009). Are we satisfied? A look at student satisfaction with diversity at traditionally White institutions. *The Review of Higher Education*, 32, 291-320.
- Price, J. H., Murnan, J. (2004). Research limitations and the necessity of reporting them. *American Journal of Health Education*, 35, 66-67.
- Roach, R. (2004). The great divide. *Black Issues in Higher Education*, 21, 22-26.
- Seidnam, I. (2006). *Interviewing as qualitative research* 3<sup>rd</sup> ed. New York: Teachers College Press.
- Tatum, B. D. (2004). The road to racial equality. *Black Issues in Higher Education*, 21, 34.
- Thomas, C. D. (1993). Making the most of your college experience. *Black Collegian*, 24, 98-102.
- Tosey, P., & Gregory, J. (1998). The peer learning community in higher education: Reflections on practice. *Innovations in Education and Teaching International*, 35, 74-81.
- Silverman, D. (2006). *Interpreting qualitative data* 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage.
- Zhao, C., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education*, 45, 115-138.

## **Examining Relationships Among Assessment Scores and Math Coursework in an Urban School District**

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### **Abstract**

This study investigates relationships between assessment scores and other indicators of math performance. The impetus for the research came from a district's need to better understand high school math achievement. Longitudinal data for a cohort of students were obtained, including math scores from their state assessment, TerraNova, and New Standards Reference Examination; cumulative math GPA; number of math courses taken; and type of math courses taken. The paper illustrates how researchers can help districts utilize their extensive databases to proactively examine data beyond accountability requirements. A discussion focuses on how results helped target areas for improvement and identified further analysis within schools.

### **Introduction**

In this era of accountability, school districts are required to maintain extensive longitudinal student databases complete with information including attendance, demographics, mobility, discipline, state test scores, course enrollment, and grades received in courses. Data systems created by districts are only useful in transforming schooling when they provide meaningful data

that stakeholders can use to raise questions, identify issues, and make informed decisions (Schmoker, 2008).

The research described in this paper stems from a partnership between a large urban school district, a community educational organization, and a local university. The partnership's initial focus was to create annual School Progress Reports (A+ Schools, 2007) that allowed administrators, teachers, and parents to access a variety of demographic, contextual, and performance indicators for each school in a form that was not available elsewhere. The data served as starting points for discussion about the strengths of each school as well as the challenges faced. Supplementary analyses followed the release of each Report with the purpose of further examining specific areas of interest to the district, such as attendance and mobility (Parke, 2006; Parke, 2008; Parke, 2009; Parke and Kanyongo, in press). The study described here is from an analysis undertaken due to the growing concern regarding low math scores on the state's 11<sup>th</sup> grade assessment. A broad question raised by the district and community was "how do students' math scores on the Pennsylvania System of School Assessment (PSSA) relate to other available measures of mathematics performance?" To this end, the analyses examined relationships between student achievement on the state test and five additional math indicators.

Although the study focuses on one school district, the purpose for sharing this research with the assessment community is to provide an example of how researchers can help districts better utilize their extensive databases to explore questions of interest to them, highlight areas that need attention, and make proactive decisions to ultimately improve learning for all students. The capacity of student data to make improvements in districts is quite large; unfortunately, much of it remains untapped because of a lack of time in personnel's busy work days, a lack of resources, or a lack of knowledge.



The following review of literature begins with a description of the state's research on relationships between assessment scores and course grades and is followed by correlation studies between scores and grades at the national level. Then, research from the mathematics education field is described in terms of the importance of incorporating coursework variables in studies that examine math achievement. Finally, the influence of race and gender on mathematics achievement is discussed.

### **Literature on Test Scores, Courses, and Grades**

#### **Previous Research on the PSSA**

The PSSA is a standards-based, criterion-referenced assessment that measures student outcomes according to state standards. It consists of both multiple-choice and open-ended items, and during the years of this study was administered in grades 3, 5, 8, and 11. Evidence for reliability, validity, and item evaluation is available in yearly technical manuals (e.g., Pennsylvania Department of Education, PDE, 2005.) In all these respects, the PSSA for mathematics is shown to be a technically sound assessment.

Studies on the 11<sup>th</sup> grade assessment investigated relationships between PSSA scores, SAT scores, self-reported total grade point average (GPA), and math course grades (Koger, Thacker, & Dickinson, 2004). Convergent validity coefficients between the PSSA and SAT were high (approximately .850.) Although the two assessments differ in content, format, and purpose, students who did well on the PSSA tended to do well on the SAT. Relationships between the PSSA and the two self-reported measures of grades were also significant but lower in magnitude (.546 for GPA total and .534 for math course grades.)

When studying PSSA scores by demographic subgroups, Koger et. al. (2004) found that, on average, high school males performed significantly higher than females, with an effect size of  $d = .31$ . White students performed higher than Black students ( $d = 1.07$ ). Students not from economically disadvantaged households performed higher than students from disadvantaged households ( $d = .75$ ). Comparisons for total GPA were significant and in the same direction as the results for the PSSA, but with smaller effect sizes for ethnicity (.71) and economically disadvantaged students (.39). Gender results were in the opposite direction. Mean GPA total was significantly higher for females than males ( $d = .239$ ).

### **Correlations Between Test Scores and Grades**

Over the past few years, Zwick and colleagues (e.g., Zwick & Green, 2007; Zwick & Schlemer, 2004; Zwick & Sklar, 2005) conducted numerous studies on the SAT and grade point averages in high school (HSGPA) and the first year of college (FGPA) to determine if relationships among scores and grades were consistent across demographic subgroups. If the relationship is stronger in one student subgroup compared to another, then the prediction of test scores using the grade variable is less effective for the subgroup with the weaker correlation. Zwick and Schlemer's study in 2004 focused on the effectiveness of SAT scores and HSGPA to predict FGPA. Using a single regression equation for the entire cohort, average prediction errors for each subgroup were obtained. Substantial overpredictions occurred for Latino non-native speakers when high school grades were the only predictor of college performance. After incorporating SAT into the model, prediction errors were smaller. A notable degree of overprediction also occurred for Asian Bilingual, Filipino, African-American, and Latino/English groups. Underpredictions were more common in the White group. Actual FGPA was higher than what was predicted by SAT and HSGA.

Zwick & Schlemer (2004) also estimated separate regression equations for each subgroup. The total amount of explained variance in SAT using all three predictors (HSGPA, SAT math, and SAT verbal) was somewhat small, ranging from .15 to .25 for most groups, with the exception of .44 for the Asian/English group. Similarly, Zwick & Sklar (2005) showed that about 23% of the variance in FGPA was explained by the high school grades and SAT.

When estimating correlations, two methods may be used. The most common is to combine data from all students, without considering the school attended, and obtain the across-school correlation matrix. This matrix represents within-school and between-school associations between variables. An alternative method is to obtain pooled, within-school correlations. This matrix does not reflect between-school variations. Using data from the College Board, Zwick and Green (2007) investigated the two methods. Across-school matrix results indicated that relationships between SES and SAT were substantially higher than relationships between SES and HSGPA. After removing between-school variations, the within-school matrix showed that the SES and SAT relationships were similar to the SES and HSGPA relationships. However, there was not a difference in the two methods for correlations between SAT and HSGPA (within-school correlation was .525 and across-school correlation was .513.)

Willingham, Pollack, & Lewis (2002) sought to understand why the relationship between test scores and grades is only moderate at best. A potential reason for the moderate relationship is the inherent nature of each measure. In terms of content and statistical properties, a standardized assessment is developed to provide data comparable across schools. Course grades, on the other hand, can vary widely across schools and teachers not only because of variations in content and format but also because teachers may take into account elements beyond knowledge and skills (e.g., class participation, attendance, behavior, and effort). In their analysis of data from NELS

1992 transcript files, three major factors accounted for differences in observed grades and grades predicted from test scores: 1) grading variation among schools, 2) scholastic engagement (e.g., showing initiative in school), and 3) teacher ratings (influence of additional elements in evaluating achievement.)

### **Incorporating Coursework Variables**

Studies in educational measurement (e.g., ACT, 2004; Campbell, Hombo, & Mazzeo, 2000; CEEB, 2001) and mathematics education (e.g., Ma, 2000; Ma & Wilkins, 2007; Riegle-Crumb, 2006; Wilkins & Ma, 2002; Wilkins, Zembylas, & Travers, 2002) incorporated coursework indicators into studies on academic achievement. Within the measurement field, results from NAEP trends analysis (Campbell, Hombo, & Mazzeo, 2000) and profiles of college-bound seniors from the College Board (CEEB, 2001) show strong relationships between math courses students take in high school and their achievement. Moreover, reports published by ACT on relationships between high school math coursework and future success in college show that “not only is taking the *right number* of courses important, but taking the *right kind* of courses is critical to student readiness for college-level work” (ACT, 2004, p. v).

In mathematics education, a body of research by Ma and Wilkins (Ma, 2000; Ma & Wilkins, 2007; Wilkins & Ma, 2002) focused on the influence of coursework on achievement in middle and high school. Using cohort data from 7<sup>th</sup> to 12<sup>th</sup> grades, Ma (2000) investigated the impact of taking specific math courses, such as prealgebra, geometry, and calculus, on students’ attitudes and achievement in math. After accounting for prior achievement, attitude, gender and SES, results from regression analysis indicated that taking algebra 1 in Grade 11 (considered to be a low-level course at this grade level) did not have a significant impact on achievement. However, taking algebra 1 in Grade 8 and trigonometry in Grade 11 (both courses considered advanced for

the particular grade levels) showed substantial effects. Thus, the timing of math courses appears to impact achievement. Smith (1996) also found that students who take algebra prior to high school had higher 10<sup>th</sup> grade math scores than students who took algebra during high school.

In their growth study, Wilkins and Ma (2002) incorporated several student personal factors into the model, such as math self-concept, educational aspirations, home resources, peer influence, teacher/parent encouragement, exposure to books, and time spent on homework. Student factors related to growth differed in middle versus high school. Self-concept had a strong effect on middle school growth, whereas educational aspirations effected high school growth. Peer influence was related to growth in middle school, but not in high school.

Finally, Ma and Wilkins (2007) investigated the extent to which math coursework influences growth in math achievement from 7<sup>th</sup> to 12<sup>th</sup> grades. In general, low-level courses had the smallest impact on growth, and advanced courses had the largest impact. Coursework effects did not systematically bias demographic subgroups. Success (not failure) in prealgebra and algebra courses in middle school was important in maintaining future growth in achievement.

### **Race, Gender, and Mathematics Achievement**

There is a wealth of research on the varying math achievement levels among demographic subgroups of students. According to Campbell, Hombo, and Mazzeo (2000), trends in math achievement on the National Assessment of Educational Progress (NAEP) over the past three decades show that the average math score of White students is higher compared to their African American and Hispanic peers. Overall, the gap decreased between 1973 and 1999, but a significant difference remains. Research also shows that math scores of students from both ethnicities varies by family income status. In a study of urban middle schools, Kinney (2008) found that 4<sup>th</sup>, 6<sup>th</sup>, and 8<sup>th</sup> grade students who qualified for free/reduced lunch, a proxy for

socioeconomic status, had significantly lower math achievement than those who did not qualify. With regard to gender, however, research is somewhat inconclusive. Some investigations report differences between males and females, while others do not. Examples from a few specific studies on the influence of demographics on math achievement are described below.

A state-level study on gender differences at the high school level (Koger et al, 2004) is one example of mixed results. Math achievement as measured by the state assessment showed that males had significantly higher scores than females. Conversely, when math achievement was measured by course grades, females came out on top with higher grades than males. An international study of high school students across 16 countries (Wilkins, Zembylas, & Travers, 2002) examined whether differences in math literacy were due to school variables (such as opportunity and experience) or individual student characteristics. Both gender and self-concept were found to be two of the most important predictors of math success. Males had higher scores than females, and higher math self-concept was related to higher math scores.

The release of the *Curriculum and Evaluation Standards for School Mathematics*, published by the National Council of Teachers of Mathematics (1989), spurred much research in examining math performance by students' race/ethnicity. The Standards stated that all students can learn mathematics and called for an increased emphasis on mathematical communication, problem solving, reasoning, and connections. A four-year study of elementary students conducted by Pungello, Kupersmidt, Burchinal, & Patterson (1996) examined ethnicity, gender, and socioeconomic status. Math achievement was negatively associated with the minority student group, specifically African American. When analyzing interaction effects, Black students had a smaller gap between the two income groups compared to White students. In another study, the conceptual and computational scales from the California Achievement Test (CAT) were used to

measure math achievement (Hall, Davis, Bolen, & Chia, 1999). No gender differences were found for either subscale. However, White students had higher scores than Black students, especially on the math concepts scale. They also found that parent variables, such as educational level and math anxiety, were related to math scores and varied somewhat by race.

Within the past decade, indicators of students' math achievement expanded from using only test scores to incorporating information about math courses taken and grades received. Several studies found differences in the types of courses taken across ethnicity subgroups. In a study by Byrnes (2003), White students were more likely to take classes beyond algebra (such as geometry and trigonometry) when compared to their African American or Hispanic peers. Riegle-Crumb (2006) investigated high school math course patterns by gender and race. White students of both genders had higher representation in advanced courses when compared to African American and Latino students of the same gender. In addition to taking fewer classes, these two student subgroups had higher failure rates when compared to White and Asian peers of the same gender. Furthermore, African American and Latino students of both genders had smaller percentages of students obtaining high grades in their math courses.

### **Summary of Literature**

The research on test scores, courses, and grades show that the type of math course taken is more important than the quantity of courses taken when examining students' readiness for college (ACT, 2004). In general, a student will more likely be an achiever (i.e., have high test scores) if he/she takes algebra in middle school with a positive self-concept, then goes on to take advanced courses in high school and has aspirations to attend college (Wilkins & Ma, 2002). Literature also shows that high-achieving students, those who perform well on state mathematics tests, tend to perform well on college-readiness tests (Koger, Thacker, & Dickinson, 2004) and

are better prepared for future success in college (ACT, 2004). Moreover, research shows the importance of examining data by demographic subgroup to identify potential inequities in assessment (Zwick & Sklar, 2005) and the availability of advanced courses (Wilkins & Ma, 2002). An implication of these research results is that when students do not have access to high-quality, advanced math courses, their achievement and options for future careers become limited (Ma & Wilkins, 2007).

### **Purpose and Research Questions**

Due to the heavy emphasis on accountability and the need to document Adequate Yearly Progress, all states and, increasingly, some districts are maintaining a wealth of student information in electronic databases. These longitudinal systems contain data to “determine not just whether an individual student’s performance is improving, but also how and why.” (Data Quality Campaign (DQC), 2009). The goal of this analysis was to investigate the nature of relationships between a state assessment and other indicators of math performance in order to provide an urban school district with a broader picture of students performance than the data they use to meet accountability requirements mandated by the No Child Left Behind Act.

This paper is unique in that the impetus for undertaking the research came from district concerns about low math performance on the state test. Year after year the district received results identifying gaps in demographic subgroups. Longitudinal student information regarding course-taking and math grades had not been systematically examined. Thus, the following three questions were posed. Personnel were specifically interested in knowing more about mathematics performance for students who stayed in the district’s high schools, therefore



analyses were conducted on data from a cohort of students who attended the district's high schools from 9<sup>th</sup> grade in 2002-03 to 11<sup>th</sup> grade in 2004-05.

- 1) What are the relationships among scaled scores on the TerraNova (TN) in 9<sup>th</sup> grade (2002-03), New Standards Reference Examination (NS) in 10<sup>th</sup> grade (2003-04), PSSA Math in 11<sup>th</sup> grade (2004-05), cumulative grade point average for math courses (GPA Math), number of math courses (Course Total), and type of math courses (Course Type)?
- 2) Do the relationships above remain consistent across gender, ethnicity, and socioeconomic (SES) subgroups?
- 3) What proportion of variance in 11<sup>th</sup> grade PSSA math scores is explained by 9<sup>th</sup> grade TN scores, 10<sup>th</sup> grade NS scores, GPA math, Course Total, and Course Type? And, are the results similar across ethnicity subgroups?

## **Methodology**

### **Sample**

This urban school district serves the second largest city in one northeastern state. Total student enrollment was approximately 32,000 during the time of the study. Across all grade levels, the majority of students (57%) were African-American, 38% were Caucasian, and 6% were Asian, Hispanic, or American Indian. Two-thirds of all students (64%) were eligible for free/reduced lunch.

There were 53 elementary schools in the district. A small portion of these schools also served grades 6, 7, and 8. Average student enrollment was 287. The 17 middle schools, grades 6 through 8, had an average enrollment of 383. Average enrollment in the 10 high schools, grades 9 through 12, was 981. Similar to most school districts in urban areas, student mobility

was high as well as the number of student disciplinary infractions, especially in the upper grade levels.

Specifically in the high schools, average student attendance was somewhat low (82%). Scores on the state assessment at grade 11 were below the state average (14 percentage points for reading and 13 percentage points for mathematics). A disparity also existed between scores for Black and White students. Across all high schools in the district, 59% of White students scored at the proficient or advanced level, whereas only 17% of Black students scored at these two highest levels. The state also had a disparity between the two subgroups, although not as large.

The cohort of district students focused upon in this paper is defined as all students who attended the district's ten high schools as 9<sup>th</sup> graders in 2002-03, 10<sup>th</sup> graders in 2003-04, and 11<sup>th</sup> graders in 2004-05 and who took the three large-scale math assessments. This represents a total of 1,298 students. Approximately 42% of the cohort students were Black, 55% were White, and 3% were other ethnicities (Asian, Hispanic, or American Indian). Slightly less than half the students (43%) were eligible for free or reduced lunch. The remainder of students in the district across these school years were called the "non-cohort" and were not included in the analysis described here.

When compared demographically to non-cohort students (Parke & Keener, 2011), the cohort had significantly higher percentages of female students, White students, and students not from low-income families as compared to the non-cohort. Academically, the cohort had significantly higher mean scores on the large-scale assessments at each grade level than the non-cohort.

### **Data Source and Variables**

Data for the study was obtained from the district's Real-Time Information system, a web-based interface designed to provide efficient and accurate access to the school's server. The district appears to be ahead of other districts across the country in terms of the potential of its system to provide meaningful longitudinal data to stakeholders (Brooks-Young, 2003; DQC, 2009; Enomoto & Conley, 2007). Several features make it a strong database. First, all information is consolidated into a centralized location. Many school systems keep records in multiple locations, leading to inaccurate data. Secondly, one department in the central office is responsible for developing and maintaining the database, and it is staffed with people who have assessment, data management, and computer/technical experience. Third, training and support for teachers and clerical staff in using the database is offered on a regular basis.

Variables in this study include math scaled scores on three large-scale assessments: the TN in 9<sup>th</sup> grade, NS in 10<sup>th</sup> grade, and PSSA in 11<sup>th</sup> grade. The district had been administering the TN and NS in order to have standardized information about students' math performance prior to the state test. There are also three math coursework variables: 1) cumulative GPA for math courses, 2) total number of math courses taken, and 3) type of math courses taken. The type of math course was a dichotomous variable: core courses only versus core plus advanced courses. Core courses included algebra 1, algebra 2, and geometry. Advanced math courses included elementary functions, advanced topics, linear algebra, calculus, and statistics. Demographic variables include gender, ethnicity, and eligibility for free/reduced lunch (a proxy for SES.)

## Data Analysis

Correlation analyses was used to answer the first question regarding the relationships among achievement indicators for the entire cohort. To investigate the second question, correlation coefficients were obtained separately by gender (male and female students) and by ethnicity/SES subgroups (Black free/reduced lunch, Black regular lunch, White free/reduced lunch, and White regular lunch students). Fisher's r-to-z transformation was used to determine if correlations between subgroups were significantly different. The "other" ethnicity subgroup was too small to include in the analyses.

Multiple regression analyses were used to answer the third question regarding the amount of variance in PSSA math performance explained by other mathematics indicators. The first analysis entered demographic variables in Step 1 and the five math indicators in Step 2. The second analysis examined the unique information provided by the two sets of math indicators. Assessment variables and math coursework indicators were entered into the equation in different orders. In other words, one regression added the TN and NS in Step 2 of the model and GPA Math, Course Total, and Course Type in Step 3. The other regression reversed the order by adding the three coursework variables in Step 2 and the two assessments in Step 3. Changes in  $R^2$  were important to examine because the district was interested in knowing how much of the variance in PSSA scores could be explained by coursework information without knowing students' scores on the other assessments. The final analyses examined whether the strength of the prediction differed by ethnicity subgroups. For example, do coursework variables account for a larger amount of variation over and above TN and NS for one ethnicity subgroup compared

to another? Thus, separate regression equations were estimated for Black students and White students.

These data analyses techniques were chosen over other equally appropriate procedures because the purpose of conducting this research was to help the district better understand mathematics achievement and produce results that were meaningful to them. A final note is that when students are nested in schools, traditional regression procedures involving ordinary least squares analysis may be problematic because of the assumption of independence of observations (Goldschmidt, Martinez, Niemi, & Baker, 2007). If this assumption is not tenable, then hierarchical linear modeling is the desired statistical procedure. Intraclass correlations can be used to examine this assumption by determining if variances in the outcome variable attributed to schools is large. When these correlations are large, then traditional regression has a tendency to underestimate standard errors. In this study, intraclass correlations, regardless of whether they were obtained by a random effects or mixed model, were less than .01, a level which is considered to satisfy the independence assumptions. Therefore, the traditional regression procedures described in the above paragraphs were deemed appropriate for the data in this study.

## **Results**

### **Research Question 1: Relationships Among Indicators for the Entire Cohort**

Correlations among all math indicators are shown in Table 1. TN and NS are strongly related to PSSA scores. The largest correlation occurred between the NS and PSSA ( $r = .859$ ). GPA math and Course Type were also significantly correlated to PSSA, and the magnitude of the coefficients were moderately large ( $r = .672$  and  $r = .557$ , respectively). Course Total was not

significantly related to PSSA ( $r = -.024$ ). Intercorrelations among math indicators were moderate to strong with the exception of course total.

Table 1. Correlation matrix for scores on three mathematics assessments and three math coursework indicators.

	<b>PSSA</b>	<b>TN</b>	<b>NS</b>	<b>GPA Math</b>	<b>Course Total</b>	<b>Course Type</b>
<b>PSSA</b>	---					
<b>TN</b>	.780*	---				
<b>NS</b>	.859*	.798*	---			
<b>GPA Math</b>	.672*	.524*	.662*	---		
<b>Course Total</b>	-.024	-.032	-.057	-.111*	---	
<b>Course Type</b>	.557*	.522*	.612*	.403*	.102*	---

\*  $p < .001$

It is possible that the correlations are underestimates of the true relationships because they were calculated at the student level. Differences between schools in assessment performance and in the assignment of course grades tends to lower the correlations (Willingham et al, 2002).

Therefore, within-school correlations were also computed. The pooled within-school correlations were quite similar to the across-school correlations given in Table1. Over 80% of the differences were less than .030, and many were .010 or less. For example, the across-school correlation between the PSSA and GPA Math was  $r = .672$ , and the within-school correlation was  $r = .671$ . One reason for the similarity in relationships estimated by the two methods might be that the data was from one large school district, whereas other research studies have used national data from many school districts across states. Most likely, the degree of grading

variation and course-taking patterns between schools would be higher at the national level than at the district level.

### **Research Question 2: Relationships Among Indicators by Subgroups**

To examine whether the magnitude of relationships was consistent across demographic subgroups, separate correlations were obtained for gender (male, female) and four ethnicity/SES categories (Black free-reduced, Black regular, White free-reduced, and White regular lunch).

The correlation matrix for gender is not shown here since there were negligible differences in male and female correlations among all indicators. Relationships between PSSA and other math indicators were equally strong for both genders, with the exception of PSSA and Course Total which was equally weak for both genders. When comparing coefficients for free/reduced and regular lunch students within ethnicity subgroups, Table 2 shows similarities and differences. First, relationships between PSSA and other indicators (except course total) were stronger for regular lunch than free/reduced lunch students, regardless of ethnicity.

For example, the PSSA and TN correlation was .755 for White regular lunch and .711 for Black regular lunch students, whereas the correlation was .661 for White free/reduced lunch and .645 for Black free/reduced lunch students. Using Fisher's  $r$  to  $z$  transformation, the correlation between PSSA and TN among all White regular lunch students ( $r=.755$ ) was not significantly different from the correlation between PSSA and TN among all Black regular lunch students ( $r=.711$ ),  $z = -1.10$ ,  $p>.05$ . Likewise the PSSA/TN correlation among all White free/reduced students ( $r=.661$ ) was not significantly different from the PSSA/TN correlation among all Black free/reduced students ( $r=.645$ ),  $z = .30$ ,  $p>.05$ . Similar results were found for the PSSA

relationships with three of the four remaining math indicators (NS, GPA Math, and Course Total).

However, the relationships between PSSA and Course Type did differ for the two ethnicities. The PSSA/Course Type correlation among all White regular lunch students ( $r=.587$ ) was significantly different from the PSSA/Course Type correlation among all Black regular lunch students ( $r=.412$ ),  $z = -2.73$ ,  $p<.01$ .



Table 2. Correlation matrix for scores on three assessments and three math coursework indicators by ethnicity and SES.

	<b>PSSA</b>	<b>TN</b>	<b>NS</b>	<b>GPA Math</b>	<b>Course Total</b>	<b>Course Type</b>
<b>PSSA</b>	---					
<b>TN</b>						
Black, free/red <sup>1</sup>	.645*	---				
Black, regular	.711*					
White, free/red	.661*					
White, regular	.755*					
<b>NS</b>						
Black, free/red	.731*	.664*	---			
Black, regular	.794*	.766*				
White, free/red	.806*	.644*				
White, regular	.829*	.774*				
<b>GPA Math</b>						
Black, free/red	.579*	.347*	.543*	---		
Black, regular	.617*	.521*	.588*			
White, free/red	.513*	.266*	.517*			
White, regular	.633*	.489*	.631*			
<b>Course Total</b>						
Black, free/red	-.001	-.029	-.107	-.174*	---	
Black, regular	.049	.052	.024	-.041		
White, free/red	-.160	-.061	-.121	-.288*		
White, regular	.039	.032	.018	.013		
<b>Course Type</b>						
Black, free/red	.298*	.225*	.341*	.263*	.016	---
Black, regular	.412*	.429*	.463*	.332*	.229*	
White, free/red	.400*	.331*	.493*	.121	.072	
White, regular	.587*	.579*	.664*	.401*	.168*	

\* p&lt;.001

<sup>1</sup>Sample sizes are 364, 182, 166, and 545 for Black, free/red; Black, regular; White, free/red; and White, regular lunch students, respectively.

Next, SES coefficients were compared within each ethnicity subgroup. For the Black subgroup, regular lunch correlations were higher than free/reduced lunch correlations for each PSSA relationship, but differences were not statistically significant.

Within the White subgroup, regular lunch correlations were higher than free/reduced lunch correlations for all PSSA relationships with other indicators, and they were also statistically

significant for four of the five pairs of correlations (PSSA/TN, PSSA/GPA math, PSSA/Course Total, and PSSA/Course Type). For instance, the correlation between PSSA and Course Type among all White regular lunch students ( $r = .587$ ) was significantly different from the correlation between PSSA and Course Type among all White free/reduced lunch students ( $.400$ ),  $z = 2.80$ ,  $p < .01$ .

In summary, there were no statistically significant differences in the strength of PSSA relationships with other math achievement indicators for the Black regular lunch group versus the White regular lunch group, except for course type which had a stronger relationship for the White subgroup. When comparing SES categories, regular lunch correlations were always higher than the free/reduced lunch correlations. Most of the differences in these correlations were statistically significant within the White student subgroup but not the Black student subgroup.

### **Research Question 3: Explaining Variance in PSSA Math Performance**

Multiple regression analysis was used to answer the third research question regarding the amount of variance in 11<sup>th</sup> grade PSSA math scaled scores explained by demographic variables, 9<sup>th</sup> grade TN and 10<sup>th</sup> grade NS math scaled scores, GPA Math, Course Total, and Course Type.

The first model included only the demographic variables. Ethnicity, SES, and gender accounted for 26.5% of the variance in PSSA scores. Ethnicity and SES were significant predictors ( $p < .001$ ), but gender was not. In the second model, ethnicity and SES were entered as a block in Step 1, then all five math indicators were entered in Step 2. The indicators accounted for an additional 52.1% of the variance above and beyond the demographic variables. Thus, the full model explained a total of 78.5% of variance in PSSA math scores ( $F_{(7, 1249)} = 652.833$ ,

$p < .001$ )<sup>1</sup>. Results for the full model are given in Table 3. When including math indicators in the model, SES was no longer significant, but ethnicity was significant ( $p < .05$ ). The TN, NS and GPA Math were significant ( $p < .001$ ). Course total and course type were also significant ( $p < .05$ ). As indicated by the standardized coefficients, NS was the most influential indicator followed by TN and GPA Math.

Table 3. Regression results for the full model of demographics and all math indicators.

Predictors	B	Beta	t	p
<b>Ethnicity</b>	17.975	.034	2.091	.037
<b>SES</b>	10.712	.020	1.319	.187
<b>TN</b>	1.452	.256	11.654	<.001
<b>NS</b>	11.786	.491	18.043	<.001
<b>GPA Math</b>	52.970	.181	10.305	<.001
<b>Course Total</b>	21.238	.027	2.049	.041
<b>Course Type</b>	18.667	.034	1.978	.048

Next, assessment variables and coursework variables were entered in different orders to examine the unique information provided by each set. The left columns of Table 4 show results for a model in which TN and NS were entered in Step 2 and GPA Math, Course Total, and Course Type were entered in Step 3. The two assessments alone accounted for an additional

<sup>1</sup> Multicollinearity, outliers, and assumptions were examined to determine the validity of the full model. Even though there were intercorrelations among some of the predictors, multicollinearity was not a problem. Collinearity statistics showed tolerance values above .1 and variance inflation factors below 10, ranging from 1.046 to 4.311. Cook's measure indicated no influential data points and DfFit values identified only 9 cases as influents, with no pattern in demographics. As for assumptions, relationships among predictors were linear and residuals were normally distributed as indicated by a normal probability plot. A standardized residual plot showed homoscedasticity of residuals.

50.1% of the variance in PSSA scores beyond ethnicity and SES. Coursework variables accounted for another 1.9% of variance.

The right half of Table 4 shows variance accounted for when coursework variables were entered in Step 2 and assessments in Step 3. Although the  $R^2$  Change for GPA Math, Course Total, and Course Type was not as large as Step 2 in the previous model for assessment indicators, the proportion of additional explained variance in PSSA math scores was still quite high (33.4%). In other words, if TN and NS scores were not available, knowing students' math coursework information and their demographics explained 60% of the variance in 11<sup>th</sup> grade PSSA math scaled scores.

Table 4. Variance in PSSA Scores Accounted for by Math Indicators in Different Orders

Model: Assessments, Coursework			Model: Coursework, Assessments		
		$R^2$ Change			$R^2$ Change
Step 1	Demographics	.265*	Step 1	Demographics	.265*
Step 2	Assessments	.501*	Step 2	Coursework	.334*
Step 3	Coursework	.019*	Step 3	Assessments	.186*
Total		.785*	Total		.785*

\* $p < .001$

#### Full Regression Model by Ethnicity

Separate models for each ethnicity were also obtained to determine if the regression on PSSA scores was similar for Black and White students. Because the previous analyses showed that gender was not significantly related to PSSA scores, only SES was entered at Step 1. It

explained 4.2% of the PSSA variance in the Black subgroup and 5.9% of the variance in the White subgroup. All math indicators were included in Step 2. Total  $R^2$  was similar for both groups (66.9% for Black and 74.9% for White). Results in Table 5 show similar standardized beta coefficients for the predictors. SES was no longer significant after including the other variables in the model. In both subgroups, the large-scale assessments (TN and NS) were the most influential predictors of PSSA followed by GPA math. For the White subgroup, Course Total and Course Type were not significant. For the Black subgroup, Course Total was significant but the standardized coefficient was quite low.

Table 5. Standardized Regression Coefficients by Ethnicity for Full Regression Equations.

<b>Standardized Beta Coefficients</b>		
	<b>Black Subgroup</b>	<b>White Subgroup</b>
<b>SES</b>	.044	.011
<b>TN</b>	.260***	.267***
<b>NS</b>	.430***	.497***
<b>GPA Math</b>	.246***	.175***
<b>Course Total</b>	.074**	.004
<b>Course Type</b>	.020	.037

\*\*p<.01, \*\*\*p<.001

#### Coursework Regression Models by Ethnicity

Results described above were for a model using all math indicators. The final set of analysis on the subgroups was conducted to examine the influence of coursework variables alone. Total

percent of variance explained by SES, GPA Math, Course Total, and Course Type was 53.4% for the White subgroup and slightly lower (41.3%) for the Black subgroup. The standardized beta coefficients in Table 6 indicate that GPA math was the most influential predictor (.538) in the black subgroup. Course Type and SES were also significant but had much smaller coefficients (.183 and .123, respectively). For the White subgroup, GPA math was also the most influential (.460) followed closely by Course Type (.398).

Table 6. Standardized Regression Coefficients by Ethnicity for Coursework Regression Equations.

	<b>Standardized Beta Coefficients</b>	
	<b>Black</b>	<b>White</b>
<b>SES</b>	.123***	.070**
<b>GPA Math</b>	.538***	.460***
<b>Course Total</b>	.070	-.032
<b>Course Type</b>	.183***	.398***

\*\*p<.01, \*\*\*p<.001

### Discussion

This section begins with an interpretation of results for each research question within the context of other literature on test scores, grades, and coursework. Most district personnel are not familiar with the larger research base, and it is beneficial for them to have conversations about how their results fit in with those from other studies. The discussion then turns to viewing the outcomes from a district's perspective and describing how they help identify priorities for schools. Some results lead to further questions of the data which is a natural part of the research

process. These additional questions will lead to deeper investigations that can ultimately make a difference in schools and student learning.

## **Situating Results in the Context of Other Related Research**

### Relationships Among Math Indicators

The two strongest relationships with PSSA were the TN and NS assessments. It is not surprising that other standardized math tests, even those with different purposes, formats, content, and item types, are strongly related to the state assessment. If students perform well on one test, they tend to perform well on another. In Thacker, Dickinson, and Koger's study (2004), coefficients for TN and PSSA in four districts in Pennsylvania were similarly high.

Two math coursework indicators also had strong relationships with the PSSA. The coefficient for PSSA and GPA math was .672, which is somewhat larger than the coefficients reported by Koger, Thacker, & Dickinson (2004). This might be due to the use of self-reported grades in the state study compared to the use of actual grades in this study. Another possibility is that the state sample was more heterogeneous than the cohort sample and between-school variations may have been large. Results from Willingham et al. (2002) support the latter rationale. They found a coefficient of .63 between total GPA and total NELS scores when using the across-school correlation method. After accounting for between-school variation and several other factors impacting the relationship, the coefficient increased to over .80.

The Course Type indicator was also moderately related to the PSSA. Students who took at least one advanced math course beyond algebra 1, geometry, and algebra 2 tended to score high on the PSSA. The only indicator not significantly related to PSSA was the number of courses taken. Other researchers have also shown that taking more math courses is not necessarily related to higher achievement (Hoffer, 1997; Ma, 2000). Instead, results from national studies

indicate that taking advanced mathematics courses is a strong predictor of math achievement, and its effect is still pronounced even after accounting for student background variables (Campbell, Hombo, & Mazzeo, 2000; CEEB, 2001).

#### Consistency in Relationships Across Demographic Subgroups

Correlational results by student subgroups showed no gender difference in the coefficients. With regard to ethnicity and SES, in most instances there were no significant differences between the Black and White regular lunch groups. The one exception was for Course Type. A stronger relationship between PSSA and Course Type occurred for White regular lunch students compared to Black regular lunch students. When comparing SES, correlations for regular lunch students, regardless of ethnicity, were always higher than correlations for free/reduced lunch students. Most comparisons were statistically significant within the White subgroup but not the Black subgroup.

Other research shows varied results, possibly due to the nature of the samples. In a validity study for the SAT, Young (2004) found that correlations between GPA and SAT were substantially lower for Black and Latino students than for White students. However, in the Willingham et. al. study (2002), correlations between grades and tests were similar. For the ethnic subgroups, interrelationships among the study's variables were consistent. Finally, with respect to international comparisons, a gender gap occurred across countries. In a study of math literacy on the TIMSS (Wilkins, Zembylas, & Travers, 2002), correlations between gender and math literacy were consistently significant. Boys tended to score higher than girls.

#### Explained Variance in PSSA Math Scores

A high percentage of variance in the PSSA (79%) was explained by the full regression model. Demographics accounted for an initial 27% of the variance, which is consistent with



other research on demographics and achievement (e.g., Ma, 2000). NS was the most influential variable, followed by TN and GPA Math. The three coursework variables jointly accounted for 33% of the variance over and above demographics, and the assessments accounted for an additional 19%. Separate regression models for ethnicities were similar in most aspects. Results using the full set of variables explained 67% of variance for Black students and 75% for White students. Standardized coefficients were consistent for the two models, and SES was not significant. Willingham et. al. (2002) also found similarity in regression results for gender and ethnicity subgroups.

However, one difference did occur. When assessments were no longer in the equation, and only coursework indicators and SES were included, the variance explained was 53% for White students, but only 41% for Black students. GPA Math was more influential in the equation for the Black group, whereas Course Type was more influential in the equation for the White group. This result raises a question as to why taking an advanced math course is more influential on PSSA scores for White students than Black students, which leads to the next section.

### **Interpreting Results from the District's Perspective**

This section discusses a few areas of particular interest to the district in their desire to understand and ameliorate inequalities related to student demographics and maximize how well their schools foster student achievement and readiness for success after high school. Some results raise questions for further exploration, other results help to confirm what they suspected based on previous reports of data. Two follow-up studies have occurred since this paper was written (Parke & Keener, 2009; 2011). Selected findings from them are incorporated here.

### Advanced Course-Taking

One relationship that stands out among the many examined is between Course Type and PSSA. Correlations between taking an advanced math course and scores on the PSSA were lower for Black students than White students. The correlation was weakest for Black low SES students (.298). Additionally, in the regression analysis, taking an advanced math course was less influential in explaining Black student performance than White student performance. These results cause one to wonder about the upper level math course experiences that are available to Black students, especially low SES. There are several potential hypothesis to explore.

First, not only do advanced courses need to be available to all students, but more importantly the content and instructional strategies must be sound in order for students to have the potential to succeed. Simply enrolling in a high-level course does not necessarily promote math learning and understanding. If students are in an environment that is not positive and does not provide them with worthwhile and meaningful learning experiences, they will not benefit from those courses (Ma & Wilkins, 2007).

Another avenue for exploration is to examine the academic culture, teacher experience, implementation of course curriculum, and grading practices in each high school. Is instructional delivery similar across schools? Do teachers know and understand the math concepts they are teaching? Overall, are some schools better than others at preparing students for success in math? Do all ten high schools offer a range of advanced courses? Are there viable course options for all students? When answering these questions, it would also be helpful to explore reasons for not taking advanced courses, some of which include low math performance in the early grades, low self-confidence, lack of motivation, and lack of encouragement from teachers or parents.

As a follow-up to this study's results, additional analyses were recently conducted within each of the ten high schools (Parke & Keener, 2009). Some findings were not surprising. Two schools that are often touted as top-performing schools in the district had positive results for both Black and White students on all math indicators. These schools had few low SES students, high attendance rates, and few discipline problems. Furthermore, two typically low-performing schools in the district had discouraging results. They had high percentages of low SES students, low attendance rates, and high numbers of disciplinary infractions.

Results were more interesting for other schools. For example, despite several negative contextual factors (majority of students were low SES, mobility rate was high, attendance was low, disciplinary rate was higher than all other schools), something positive seemed to be occurring in one school. Student performance on the state assessment was somewhat above average. The school also had the highest GPA math mean for Black students across the district, one of the highest percentages of Black students taking advanced mathematics across all schools, and one of the lowest percentages of Black students failing math courses. Now the district needs to conduct a qualitative analysis to discover what is occurring in mathematics classrooms in this school.

### Gender

Results for gender aligned with other data from the district. They do not need to be as concerned about gender differences as they do about ethnicity or SES differences. Previous reports showed that gender gaps in high school math achievement and coursework were essentially non-existent. However, a recent analysis that disaggregated gender by ethnicity found that equal percentages of White male and White female students took advanced math

courses, but a higher percentage of Black females compared to Black males took advanced math (Parke & Keener, 2009). This result will be further investigated within schools.

#### Information Provided by TN and NS

During the school years analyzed in this study, the district administered two large-scale assessments because they wanted standardized information on student math performance between the 8<sup>th</sup> grade and 11<sup>th</sup> administrations of the PSSA. Correlations between TN, NS, and PSSA, technically called validity coefficients, were quite high, especially considering that a whole year passed between taking the tests. Students who scored well on one test scored well on another, which is not uncommon in educational testing. Recently, the district made a decision to no longer use the TN and NS. Instead, they are using a benchmark assessment (4Sight) which gives teachers diagnostic information to analyze and use in making instructional adjustments. Anecdotal reports on how results are used and the impact they have on student learning is positive. Empirical data is now needed to support these claims.

#### Students Not in the Cohort

The study raised a broader question about the non-cohort students who attended the district high schools for some, but not all, years. District personnel and others hold the belief that most students leave for one of three reasons: 1) families move to a suburban or rural district outside the city limits, 2) families stay in the district but transfer their children to private, religious, charter, or cyber schools, or 3) students drop out of school. Accountability reports show high dropout rates, especially for some schools, but there has not been concrete data on the reasons for exiting.

The district database maintains information on when, where, and why students transfer for the purposes of examining movement of students within and outside the system. In follow-up

analyses from this study (Parke & Keener, 2011), a beginning attempt was made to determine when and why students leave. Most non-cohort students left after 9<sup>th</sup> grade. The average grade in 9<sup>th</sup> grade math courses was between a “B” and “C” for cohort students versus a “D” for non-cohort students. Tracking students is a complicated process, though. Many non-cohort students had complex withdrawal and reentry patterns that involved moving in and out of the district, attending alternative education centers, and dropping out of school only to return again a few months later. These preliminary results warrant more attention to better understand why enrollment in the district decreases in the high school years.

### **Final Remarks**

Although this study was specific to one school district, there are practical applications that can project out to researchers who investigate mathematics achievement as well as researchers who work with school personnel to help them better utilize student databases. The latter reflects the *process* of conducting a study similar to the one presented here, and the former refers to *knowledge* gained from this study of urban high school students’ math performance.

One of the most important steps in the process of helping schools make meaning of their data is to create a clear, specific question that relates to administrators’ and teachers’ needs. Broad questions such as “what can the data tell us about students’ math achievement across our high schools?” will not suffice. Instead, a conversation should take place about the variables to include, the specific sample of students, and the time period upon which to focus. The breadth of data can be overwhelming, but one should resist the urge to include all available variables.

Secondly, try to steer clear of analyses that have already been done and for which everyone knows the answer. For example, some researchers (e.g, Lubienski & Gutierrez, 2008) are now

saying that gap analyses that compare mean math scores or percent proficient for one student subgroup versus another are no longer beneficial. This research does not guide further analysis nor does it help in making decisions. In the study described here, the district already knew a gap existed in math scores, so they focused instead on exploring relationships among several math indicators to gain a more in-depth picture of performance in their high schools. Finally, the simplest approach to analysis should be used so that everyone can understand the meaning of the results. As long as it is technically sound and systematically provides an answer to the question, the analysis does not need to be fancy or unnecessarily complex.

A few key outcomes of this study may be of interest to researchers of mathematics educators and school personnel. The number of math courses taken in high school was not related to math scores in any way. However, the type of math course taken was related, and it varied by race. These results helped to set priorities for further analysis in the school district, generating questions such as: Why is taking advanced math scores more influential on math scores for White students than Black students? Are White students learning more in the advanced math courses? Are both subgroups of students equally prepared to take the advanced courses?

Advanced course-taking and grades have been shown to vary across subgroups in a few other research studies in mathematics education (e.g., Riegle-Crumb, 2006). To answer these types of questions in large school districts, analysis by high school could be undertaken. Possibly, teachers are more mathematically experienced and provide higher quality instruction at one school versus another; or the overall school environment and culture at one school might be more positive toward learning and enjoying math than at another school. In smaller districts, additional indicators of math performance can be examined at the classroom level, such as

samples of student work and the cognitive level of math discussions. The ultimate goal in these further analyses is to improve upon the teaching and learning process in all math classrooms.

## References

- A+ Schools. (2007). *The Third Annual Report to the Community on Public School Progress*.  
A+ Schools: A Community Alliance for Public Education, Pittsburgh, PA.
- ACT. (2004). *Issues in College Readiness: The Sensitivity of the ACT to Instruction*. Iowa City, IA: Author.
- Brooks-Young, S. (2003). Technology's role in accountability reporting. *School Planning and Management*, 42(5), p. 42-44.
- Byrnes, J. P. (2003). Factors predictive of mathematics achievement in White, Black, and Hispanic 12th graders. *Journal of Educational Psychology*, 95, 316-326.
- Campbell, J. R., Hombo, C. M., & Mazzeo, J. (2000). *NAEP 1999 trends in academic progress: Three decades of student performance*. Washington, DC: U.S. Department of Education.
- College Entrance Examination Board (2001). *2001 profile of college-bound seniors*. New York, NY: Author.
- Data Quality Campaign. (2009). *The Next Step: Using Longitudinal Data Systems to Improve Student Success*. Author.
- Enomoto, E. K. & Conley, S. (2007). Harnessing technology for school accountability: A case study of implementation. *Planning and Change*, 38(3/4), p. 164-180.
- Goldschmidt, P., Martinez, J. F., Niemi, D., & Baker, E. L. (2007). Relationships among measures as empirical evidence of validity: Incorporating multiple indicators of achievement and school context. *Educational Assessment*, 12(3&4), 239-266.
- Hall, C. W., Davis, N. B., Bolen, L. M., & Chia, R. (1999). Gender and racial differences in mathematical performance. *Journal of Social Psychology*, 139(6), 677-89.



- Hoffer, T. B. (1997). High school graduation requirements: Effects on dropping out and student achievement. *Teachers College Record*, 98, 584-607.
- Koger, M. E., Thacker, A.A., & Dickinson, E.R. (2004). *Relationships among the Pennsylvania system of school assessment (PSSA) scores, SAT scores and self-reported high school grades for the classes of 2002 and 2003*. HumRRO Report No. FR-04-26.
- Lubienski, S. T. & Gutierrez, R. (2008). Bridging the gaps in perspectives on equity in mathematics education. *Journal for Research in Mathematics Education*, 39(4), p. 365-371.
- Ma, X. (2000). A longitudinal assessment of antecedent coursework in mathematics on subsequent mathematical attainment. *Journal of Educational Research*, 94, 16-28.
- Ma, X. & Wilkins, J. L. M. (2007). Mathematics coursework regulates growth in mathematics achievement. *Journal of Research in Mathematics Education*, 38(3), 230-257.
- National Council of Teachers of Mathematics. (1989). *Curriculum and Evaluation Standards for School Mathematics*. Reston, VA: NCTM.
- Parke, C. S. (2006). *Student Attendance and Mobility and the Effects on Student Achievement in Mathematics and Reading*. Technical Report #06-12-01. Pittsburgh, PA: A+ Schools: A Community Alliance for Public Education.
- Parke, C. S. (March 2008). *High School Mathematics Achievement for a Cohort of Students (2002 to 2005): Large-Scale Assessments and Math Coursework*. Technical Report #08-03-01. Pittsburgh, PA: A+ Schools: A Community Alliance for Public Education.
- Parke, C. S. (2009). *Mathematics Achievement for Cohort and Non-Cohort High School Students (2002 to 2006): Large-Scale Assessments and Math Coursework*. Technical Report #09-05-01. Pittsburgh, PA: A+ Schools: A Community Alliance for Public Education.

- Parke, C. S., & Kanyongo, G. (In press). Student attendance, mobility, and mathematics achievement in an urban school district. *Journal of Educational Research*.
- Parke, C. S. & Keener, D. (2009). *Analyzing math assessment scores, math coursework, and contextual factors for high schools in an urban district*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
- Parke, C. S., & Keener, D. (2011). Cohort versus non-cohort high school students' math performance: Achievement test scores and coursework. *Educational Research Quarterly*, 35(2), p. 3-22.
- Pennsylvania Department of Education. (2005). *Technical Report for the Pennsylvania System of School Assessment: 2005 Reading and Mathematics*. Data Recognition Corporation.
- Riegle-Crumb, C. (2006). The path through math: Course-taking trajectories and student performance at the intersection of gender and race/ethnicity. *American Journal of Education*, 113(1), 101-122.
- Schmoker, M. (2008). Measuring what matters. *Educational Leadership*, p. 70-74.
- Smith, J. B. (1996). Does an extra year make any difference? The impact of early access to algebra on long-term gains in mathematics achievement. *Educational Evaluation and Policy Analysis*, 18, 141-153.
- Thacker, A. A. & Dickinson, E. R. (2004). *Item Content and Difficulty Mapping by Form and Item Type for the 2001-2003 Pennsylvania System of School Assessment (PSSA)*. Alexandria, VA: Human Resource Research Organization.
- Thacker, A. A., Dickinson, E. R., & Koger, M. E. (2004). *Relationships Among the Pennsylvania System of School Assessment (PSSA) and Other Commonly Administered Assessments*. Alexandria, VA: Human Resource Research Organization.

- Wilkins, J. L. M., & Ma, X. (2002). Predicting student growth in mathematical content knowledge. *Journal of Educational Research*, 95(5), 288-298.
- Wilkins, J. L., Zembylas, M., & Travers, K. J. (2002). Investigating correlates of mathematics and science literacy in the final year of secondary school. In D. F. Robataille & A. E. Beaton (Eds.) *Secondary Analysis of the TIMSS Results: A Synthesis of Current Research* (p. 291-316). Boston, MA: Kluwer Academic Publishers.
- Willingham, W. W., Pollack, J. M., & Lewis, C. (2002). Grades and test scores: Accounting for observed differences. *Journal of Educational Measurement*, 39, 1-37.
- Young, J. W. (2004). Differential validity and prediction: Race and sex differences in college admissions testing. In R. Zwick (Ed.), *Rethinking the SAT: The Future of Standardized Testing in University Admissions* (pp. 289-301). New York: Routledge/Falmer.
- Zwick, R. & Green, J. G. (2007). New perspectives on the correlation of SAT scores, high school grades, and socioeconomic factors. *Journal of Educational Measurement*, 44(1), p. 23-45.
- Zwick, R. & Schlemer, L. (2004). SAT validity for linguistic minorities at the University of California, Santa Barbara. *Educational Measurement: Issues and Practice*, 23(1), 6-16.
- Zwick, R. & Sklar, J. C. (2005). Predicting college grades and degree completion using high school grades and SAT scores: The role of student ethnicity and first language. *American Educational Research Journal*, 42(3), 439-464.

## **A Kaleidoscope: Using True Colors™ and the Holland Scale for Career Exploration**

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## **A Kaleidoscope: Using True Colors™ and the Holland Scale for Career Exploration**

### **Problem**

Many students in higher education institutions present themselves as undeclared majors and over time these students become high risks for academic failure. Noel (1985) claimed that, “uncertainty about what to study is the most frequent reason that talented students give for dropping out of college” (p. 12). Anderson (1985) concurred and suggested that uncertainty and indecision about career plans is a negative personal barrier to persistence for the undecided. Current studies have shown that one out of every four college students will drop out after his/her first year (U.S. Department of Education, 2000). For this reason many higher education institutions consider retention to be a very high priority.

Research has shown that the first step in any major career decision-making process is self-knowledge. Many students begin their collegiate careers with a large measure of career uncertainty and require guidance from faculty advisors and mentors.

### **Purpose**

The major focus of this study was improved self-knowledge for our undeclared students which would result in more carefully-focused career decisions. The Pre-Major

Academic Advising Center works on a continuing basis with over 1700 undecided students. Students in this exploring phase require more than one hour of scheduled advisement and this may not always be humanly possible. This study examined the relevance and success of three highly informative and career-specific workshops, based on the True Colors Model™ of personality types coupled with the Holland Scale of Career Themes, for one-hundred fifty undecided students at three different times during the academic year (September 2010, November 2010, and February 2011).

The True Colors™ Model has evolved as a very user-friendly version of the work of Karl Jung, Katharine Cooke Myers, and Isabel Myers Briggs. By utilizing color as a metaphor, the True Colors™ Model effectively defines personality types/ learning styles and in conjunction with the Holland Scale assists in directing students' career choices.

### **Relevant Literature**

The Ridgell and Lounsbury study (2004) concluded that the predictors of academic achievement consisted of non-cognitive measures, such as personality traits, as well as cognitive measures. In a similar study, Dyer (1987) determined that specific personality traits in addition to strong cognitive acumen predicted the possibility of strong academic performance. Within the last 20 years a number of research studies have addressed the link between students' cognitive ability and personality traits and the same students' performance and success in higher education ( Dyer, 1987; and O'Brien, 2000). From these studies, research suggests that personality may be a factor that is worth consideration when predicting the academic success of a given sample of collegiate students. Because of the diversity which exists there is no one proven methodology which works best with every undecided student ( Steele & McDonald, 2000).

## **Methods**

In preparing and scheduling the three True Colors™/Holland Scale workshops, critical times for undeclared majors during the academic year were chosen. These included: a) the beginning of the school year, b) the week after midsemester examinations, and c) the month after final grades had been released. To gather campus-wide interest and attendance, flyers and emails were generated across the entire campus for several weeks prior to the event.

The workshops were three hours in duration and afforded opportunity to gather data before, during and after the presentations. The Career Decision Scale Pre/Post Tests were used in addition to a locally-prepared qualitative instrument with general and open-ended probes addressing the student's level of career uncertainty. All data collection instruments were used in anonymity.

During the workshop itself the students responded favorably to the True Colors™ presentation and readily identified their types/styles. Additional activities and group discussions guided the students in transferring their newly-acquired self-knowledge to the descriptions of careers which worked well with their personal strengths, needs, and values. This was the most productive part of the experience and the students readily related to the careers which embraced their personality style and type.

## **Results and Conclusions**

Each of the workshops was scheduled at a time during the academic year when students might be stressing over their course work or experiencing academic failure. The

number of students responding was much greater than those in attendance on a given day. These results were consistent with many of these undecided students' inability to follow through on academic commitments related to their career-direction options.

There was a strong degree of positive feedback from the students who attended the workshops and many students reported much more focus in their choosing and fewer instances of career indecision. These examples of qualitative data were useful and the research continues into the next academic year. In the gathering of quantitative data the instrument of choice had been the Career Decision Scale which the students completed at the beginning and end of each workshop experience. These data were analyzed during the spring of 2011 to determine the effectiveness of these particular career interventions with this population. The students' analyzed responses were distributed among three distinct categories: invalid, intervention needed or additional assessment needed. These designations proved to be too general for the purposes of the research and the ability to assist students in specific ways.

### **Recommendations**

Every student who attended a workshop rated it as being very informative and helpful. The general consensus supported two workshops in the future as the students wished for more information with a reflective period of several weeks separating the events. In the data collection the qualitative probes proved to be very effective in targeting new themes for future workshop opportunities. The quantitative instrument yielded results that were too general to assist individual students and will be replaced with a newer and more practical assessment contained within the 2011 True Colors™ Career materials. This instrument will provide specific guidelines and supportive information for

future workshops and advisement sessions using the True Colors™ Model which worked very well with our students. The workshops yielded very positive results with our students and may suggest the possible introduction of a 1 credit course as another alternative for those students who desire more engagement and additional information.



## References

- Anderson, E. (1985). Forces influencing student persistence and achievement. In Noel, L., Levitz, R., Saluri, D., & Associates. *Increasing student retention: Effective programs and practices for reducing the dropout rate*. San Francisco, CA: Jossey-Bass.
- Dyer, E.D. (1987). Can university success and first year job performance be predicted from academic achievement, vocational interest, personality, and biographical measures? *Psychological Reports*, 61(1), 655-671.
- Noel, L., Levitz, R., Saluri, D., & Associates. *Increasing student retention: Effective programs and practices for reducing the dropout rate*. San Francisco, CA: Jossey-Bass.
- O'Brien, T., Bernold, L. & Akroyd, D. (1998). Myers-Briggs type indicator and academic achievement in engineering education. *International Journal of Engineering Education*, 4(1), 311-315.
- Ridgell, S. & Lounsbury, J.W. (2004). Predicting collegiate academic success: General intelligence, "Big Five" personality traits, and work drive. *College Student Journal*, 38(4) 607-618.
- Steele, G.E. & McDonald, M.L. (2008). Moving through college. In Gordon, V.N., Habley, W.R., Grites, T.J. & Associates (eds.) *Academic advising: A comprehensive handbook*. San Francisco, CA: Jossey-Bass.

Welcoming Non-Hispanic Students and Faculty to Hispanic Serving Institutions: Predictors  
of Hispanic Students Attitudes toward Diversity at Majority Hispanic HSIs

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**Abstract**

Despite the considerable research that has been conducted on issues of diversity on college campuses, there has been limited research addressing this issue on Hispanic Serving Institutions (HSIs). The present study investigated the predictors of Hispanic students' attitudes toward special efforts to recruit non-Hispanic students and faculty at an HSI. Thirty-nine percent of Hispanic students supported efforts to recruit non-Hispanic students and 45% support efforts to recruit non-Hispanic faculty. Membership in on-campus clubs and organizations predicted students' support of special efforts to recruit both non-Hispanic students and faculty. However, speaking Spanish at home was only a predictor of support for efforts to recruit non-Hispanic students.

The Hispanic population within the United States is projected to increase from 46.7 million people in 2008 to 132.8 million by 2050 (US Census Bureau, 2008) and this increase in population is very likely to result in an increase of Hispanic residents in a variety of institutions in the United States. One of these institutions likely to see an increase

in the number of Hispanic residents are educational institutions. As the Hispanic population increases in the US, so will the number of Hispanic students attending institutions of higher education. The projected number of Hispanic students attending degree-granting institutions is expected to nearly double between 2000 and 2018, resulting in 2,863,000 Hispanic students enrolling in institutions of higher education by 2018 (National Center for Education Statistics, 2009).

According to the National Center for Educational Statistics in 2002, 47% of Hispanic students attending a degree granting institution were attending Hispanic Serving Institutions (HSIs). Hispanic Serving Institutions (HSIs) are defined as institutions of higher education where the total Hispanic enrollment is a minimum of 25% of the total enrollment of the institution (HACU, 2009). In 2007 there were 265 HSIs in the United States, as well as 176 Emerging HSIs (Santiago & Andrade, 2010). Emerging HSIs are institutions where the enrollment is between 15 and 25% Hispanic (Santiago & Andrade, 2010).

Currently, the majority of HSIs in the United States have Hispanic populations below 50% resulting in most HSIs not being predominately Hispanic. Consequently, research thus far on issues related to diversity at most HSI-designated institutions have focused on institutions where the majority of the student population is NOT Hispanic (Dayton, Ganzales-Vasques, Martinez, & Plum, 2004). Therefore, the validity and applicability of these findings for HSI where the majority of the student body is Hispanic is questionable. The applicability and validity of these findings for HSI where Hispanic students are the majority is questionable because research has found that exposure to students from other ethnic backgrounds influences Hispanic students' views about people from those groups (Aberson, Porter, & Gaffney, 2008).

The increasing number of Hispanics attending college, and the increasing number of Hispanics attending HSIs, is likely to impact the number of HSIs having a majority Hispanic population. As such, the campus climate towards diversity could then be greatly impacted by the change in HSI composition from minority to majority Hispanic. Not only will the changing composition of HSIs likely influence students' attitudes toward diversity, but recent research on academic leaders at HSIs has found that these persons are concerned about diversity. De Los Santos Jr and De Los Santos (2003) found that HSI campus leaders (e.g. presidents and chancellors) rank growth and diversity as their fourth greatest concern, demonstrating that on some level these leaders are thinking about the issue of diversity and how it will impact their college campuses. The purpose of this research is to determine the factors that influence Hispanic students' attitudes towards diversity at a majority Hispanic HSI.

### **Review of Literature**

Research on issues of diversity on college campuses has primarily been performed at historically and predominately Caucasian institutions. Much of this research has focused on the experiences of non-Caucasian students verses Caucasian students at these institutions. For instance, Ancis, Sedkacek, and Mohr (2000) found that different ethnic groups of students reported different views of the climate toward diversity at their institutions. These researchers found that Asian American, African American, and Hispanic students reported experiencing prejudice in the form of professors and teaching assistants showing limited respect and unfair treatment far more than Caucasian students did/reported. Additionally, African American and Hispanic students reported significantly lower levels of satisfaction with the campus climate toward diversity than Caucasian

students. This research also found that African American and Hispanic students on predominately Caucasian campuses expressed greater comfort with those of different ethnic groups than Caucasian students.

Some studies have gone beyond simple descriptive analyses of students' experiences and investigated the causes of different attitudes toward diversity. Pascarella, Edison, Nora, Hagedorn, and Terezin (1996) investigated the experiences which impacted students' openness to diversity during the first year of college at 18 institutions across the United States. They found that pre-college factors (openness to diversity and academic achievement), age, academics, peer interactions, and students' perception of their campus's openness to diversity impacted students' openness to diversity at the end of their first year of college. Students' pre-college openness to diversity had the largest impact on openness to diversity at the end of the first year of college. All of the other factors had smaller positive relationships to end of year openness to diversity.

Pascarella et al. (1996) also found that white students' and non-white students' openness to diversity was impacted differently by various factors dealing with the college campus. Living on campus and participating in cultural workshops had a greater impact on white students than non-white students in terms of their openness to diversity. Joining Greek life had a strong negative impact on white students and a small positive impact for non-white students. If an institution emphasized being critical, evaluative, and analytical white students were more open to diversity, while non-white students were less open to diversity (Pascarella, et al., 1996). While these findings indicate that campus factors can have differential impact on students from varying ethnic groups, it is impossible to tell whether this difference is because of inherent differences between white and non-white

students or because of the difference in status between groups in the majority and those in the minority.

While the majority of research on students' views of diversity have focused on predominately and historically Caucasian institutions, there are a few studies conducted at majority Hispanic HSIs that have addressed some aspects of diversity related to issues of Hispanics students' sense of belongingness and academic success. For example, Dayton, Gonzalez-Vasquez, Martinez, and Plum (2004) found that Hispanic students are under unique cultural pressure to focus on family life over personal desires. By attending an HSI, where the classmates understand the pressures unique to the Hispanic population, students have a greater sense of belongingness and higher academic achievement. In addition, the researchers found that having staff at an institution who are similar in ethnic background to the student body also positively influences student success.

Maestaz, Vasquera, and Zehr (2002) also researched the predictors of Hispanic students' sense of belongingness at HSIs. This study found that showing positive behaviors towards diversity, socializing with different ethnic groups, and supporting affirmative action goals positively influences students' sense of belongingness. Other factors which positively impacted students' sense of belonging at HSIs included feeling as if faculty have an interest in students' well being, being involved in Greek organizations, and holding campus leadership positions. These are similar to the factors that Pascarella, et al. (1996) found impacted openness to diversity, suggesting that factors similar to those that impact students at historically Caucasian institutions also impact students at HSIs.

While there has been research done at predominately Caucasian HSIs on factors which influence attitudes of diversity, there has been little research conducted at

predominately Hispanic HSIs regarding attitudes toward diversity. This lack of research limits the understanding of campus climate at these types of institutions. As the number of HSIs and predominately Hispanic HSIs increases in the coming years, it is imperative to have an understanding of the openness of Hispanic students to students and faculty of other ethnic backgrounds.

The present study investigated Hispanic students' openness to diversity through a proxy measure- students' support for special efforts to recruit students and faculty from other ethnic groups. It was hypothesized that students' demographics (sex, household income, home language, and political orientation), level of prejudice (*Modern Racism Scale*), and contact with students from different backgrounds (*Student Acquaintance Scale* and *Club Membership*) would predict students' support of special efforts to recruit students and faculty from non-Hispanic ethnic groups.

## **Method**

### **Sample**

Hispanic undergraduate students at a predominately Hispanic HSI were surveyed for this study. At the time of data collection, 96% of students enrolled at the institution self-identified as being of Hispanic origin. The sample was balanced in terms of sex (53% male) and political orientation, with ~~and~~ 42% of the sample reporting a liberal political orientation. The majority of respondents were born in the United States (80%) and lived in the United States (95%). The average age of participants was 22 years old and the median household income was \$30,000-\$39,999.

### *Instrument*

The present study used data from a larger survey of Hispanic students' attitudes toward diversity. The independent variables were based on 5 demographic questions, the Modern Racism Scale, and the Student Acquaintance Scale. Sex, political orientation, home language, and club membership were all rated on dichotomous scale: male/female, conservative/liberal, English/Spanish, non-member/member.

The present study used a 5-item modified version of the *Modern Racism Scale*, which excluded questions concerning busing. Each question was rated on a 7-point Likert-type scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree), with one reverse coded item. High scores represent more negative attitudes toward African Americans.

The Student Acquaintance Scale consists of 8 Likert-type items that measure students' contact with other students from different backgrounds. Each item asks students to rate the frequency with which they have had contact with students from different backgrounds on a 4-point scale, from 1 (Never) to 4 (Very Often). Higher scores represent more frequent interactions with students from different backgrounds.

The dependent variables, participants' openness to taking special efforts to recruit non-Hispanic students and faculty, were measured using dichotomous variables. For each question, students were asked to identify which ethnic groups of students or faculty the college should take special efforts to recruit (students could identify more than 1 group). Students could also indicate that no special efforts should be taken to recruit students and faculty from specific ethnic groups. Student responses were recoded into a single dichotomous variable, with 0 representing the no special efforts should be taken option and 1 representing the identification of at least one group for special recruitment efforts.

## **Design**



The present study used a predictive correlational design. Specifically, the present study used a binary logistic regression. A binary logistic regression is used to predict a nominal dependent variable using nominal and continuous variables (Afifi, Clark, & May, 2004). In the present study, dependent variables (special efforts to recruit non-Hispanic faculty and special efforts to recruit non-Hispanic students) are both nominal. The independent variables include both nominal (e.g. sex & club membership) and continuous variables (e.g. *Student Acquaintance Scale* and *Modern Racism Scale*).

### **Procedure**

Students were recruited using two techniques. The first techniques involved visiting undergraduate social science classes and asking students to complete the survey. The second method involved placing a table at 2 high traffic areas on campus, outside the library and in the cafeteria. As students walked by they were asked if they would be willing to spend fifteen minutes completing a survey. Students who volunteered were seated at a table with privacy dividers to complete the survey. Only surveys completed by Hispanic students were included in the present analysis.

### **Results**

The hypothesis was tested using 2 logistic-regressions. The first regressed the Student Acquaintance Scale, the Modern Racism Scale, sex, political orientation, home language, household income, and membership in on-campus clubs on students' belief that special efforts should be taken to recruit non-Hispanic faculty. The second regressed the Student Acquaintance Scale, the Modern Racism Scale, sex, political orientation, home language, household income, and membership in on-campus clubs on students' beliefs that special efforts should be taken to recruit non-Hispanic students. A slightly higher

percentage of students supported special efforts to recruit non-Hispanic faculty (45%) than supported special efforts to recruit non-Hispanic students (39%). Means, standard deviations, and ranges are presented in Table 1.

Table 1

## Descriptive Statistics

Variable	Mean	SD	Range	N
Acquaintance	19.21	6.09	24	189
Modern Racism	14.94	4.86	20	189
Sex	.50	.50	1	189
Political Orientation	.52	.50	1	189
Home Language	.59	.49	1	189
Household Income	3.49	2.69	9	189
Club Membership	.38	.49	1	189
Non-Hispanic Faculty	.55	.50	1	189
Non-Hispanic Students	.61	.49	1	189

The first model, regressing the predictors on students' beliefs that special efforts should be taken to recruit non-Hispanic Faculty, was not significant,  $\chi^2(7, N = 186) = 12.55$ ,  $p = .08$  (See Table 2). However, club membership was a significant predictor of students' attitudes toward recruiting non-Hispanic Faculty. Students who were members of clubs were 2.26 times more likely to believe special efforts should be taken to recruit non-Hispanic faculty than students who did not belong to clubs.

Table 2  
Logistic Regression of  
Non-Hispanic Faculty

Predictor	B	Wald $\chi^2$	P	Odds Ratio
Acquaintance	.01	.18	.68	1.01
Modern Racism	-.03	.03	.38	.97
Sex	.39	1.58	.21	1.48
Political Orientation	.22	.51	.48	1.25
Home Language	.32	.89	.35	1.38
Household Income	-.06	1.00	.32	.94
Club Membership	.82	5.69	.02	2.26

The second model, regressing the predictors on students' beliefs that special efforts should be taken to recruit non-Hispanic students, was significant,  $\chi^2(7, N = 189) = 25.38, p = .001$  (See Table 3). Using the Cox & Snell R-Square, the model explains 13% of the variance in the probability that students support special efforts being taken to recruit non-Hispanic students. At the individual variable level, two variables were significant predictors. Students who belonged to clubs were 3.01 times more likely to support special efforts being taken to recruit non-Hispanic students, while students who spoke Spanish at home were 2.13 times more likely to support special efforts being taken to recruit non-Hispanic students.

Table 3  
Logistic Regression of  
Non-Hispanic Students

Predictor	B	Wald $\chi^2$	P	Odds Ratio
Acquaintance	.01	.22	.64	1.01
Modern Racism	-.05	2.25	.13	.95
Sex	.61	3.39	.07	1.84
Political Orientation	.41	1.55	.21	1.51
Home Language	.76	4.57	.03	2.13
Household Income	-.07	1.41	.24	.93
Club Membership	1.10	8.71	.003	3.01

### Discussion

The hypothesis was partially supported by the findings. The overall model predicted student attitudes toward recruiting non-Hispanic students but not non-Hispanic faculty. However, individual variables did significantly predict both dependent variables. The present study found that club membership was a predictor of students' attitudes toward recruiting both non-Hispanic students and faculty. Students who belonged to clubs, compared to those who did not have club membership, were more likely to believe special efforts should be taken to recruit non-Hispanic students and faculty.

Club membership's influence on students' support of special recruitment efforts for non-Hispanic faculty and students was supported by Pascarella et al's (1996) findings concerning peer interactions. They found that interacting with peers and acquaintances

had positive impacts on students' openness to diversity. Openness to diversity was defined by Pascarella et al as enjoying intellectual challenges caused by various perspectives and appreciation of racial/cultural diversity. Similar to what was found with Pascarella et al and their findings of the benefits of club membership regarding openness to diversity, students in the present study who belonged to clubs (which would increase their peer interactions) were more supportive of the present study's measure of openness to diversity.

While club membership predicted students' attitudes, the other measure of contact with diverse students did not. This may be due to the nature of interactions measured by the two predictors. The *Student Acquaintance Scale* measures both casual and long-term intimate contact, while being a member of a club requires one to have long-term contact with other students. The present findings suggest that long-term intimate interactions, such as those provided through club membership, may be required to impact students' attitudes toward diversity.

Students whose home language was Spanish were more likely, than those students who spoke English at home, to support special efforts to recruit non-Hispanic students. This finding is similarly supported by Pascarella et al's (1996) findings. If a student speaks primarily Spanish at home, the student is already immersing themselves in cultural differences by attending an English speaking school. Based on Pascarella et al's findings, this interaction with students from different cultural backgrounds would increase students' appreciation for culturally diverse surroundings and their support for efforts to increase diversity.

These findings suggest that similar factors impact students' attitudes toward diversity regardless of the ethnic group of students who are in the majority. This is good news for college officials who are trying to promote openness toward and acceptance of diversity at their institutions. Strategies and techniques developed at predominately Caucasian institutions are likely to be effective at predominately Hispanic HSIs because similar factors impact majority students' attitudes at both types of institutions.

In order to further develop our understanding of issues of diversity at HSIs, future research should continue the present study's investigation of factors that predict Hispanic students' support of policies that promote diversity. Additionally, research should investigate the experiences of non-Hispanic students at Majority Hispanic HSIs. Research should also be performed on which ethnic groups Hispanic students at majority Hispanic HSIs would support their universities recruiting. This research can help institutions make more appropriate policies which influence diversity and improve openness/appreciation for diversity at these institutions.

## References

- Aberson, C. L., Porter, M. K., & Gaffney, A. M. (2008). Friendships influence Hispanic students' implicit attitudes toward white Non-Hispanic relative to African Americans. *Hispanic Journal of Behavioral Sciences*, 30(4), 544-556.
- Afifi, A., Clark, V. A., & May, S. (2004). *Computer-Aided Multivariate Analysis (4<sup>th</sup> ed)*. Boca Raton, FL: Chapman & Hall/CRC.
- Ancis, J. R., Sedlacek, W. E., & Mohr, J. J. (2000). Student perceptions of campus cultural climate by race. *Journal of Counseling & Development*, 78(2), 180-185.
- Dayton, B., Gonzalez-Vasquez, N., Martinez, C. R., & Plum, C. (2004). Hispanic-serving institutions through the eyes of students and administrators. *New Directions for Student Services*, Spring(105), 29-40.
- De Los Santos, A. G. Jr., & De Los Santos, G. E. (2003). Hispanic-serving institutions in the 21<sup>st</sup> century: Overview, challenges, and opportunities. *Journal of Hispanic Higher Education*, 2(4), 377-391.
- Hispanic Association of Colleges and Universities. (2008). Fact sheet Hispanic higher education and HSIS. In *News and Alerts* (Data, Statistics, and Research). Retrieved from [http://www.hacu.net/hacu/HSI\\_Fact\\_Sheet\\_EN.asp?SnID=2](http://www.hacu.net/hacu/HSI_Fact_Sheet_EN.asp?SnID=2)
- Maestas, R., Vaquera, G. S., & Zehr, L. M. (2007). Factors impacting sense of belonging at a hispanic-serving institution. *Journal of Hispanic Higher Education*, 6(2), 237-256.
- Pascarella, E. T., Edison, M., Nora, A., Hagedorn, L. S., & Terenzini, P. T. (1996). Influences on students' openness to diversity and challenge in the first year of college. *Journal of Higher Education*, 67(2), 174-195.



Santiago, D. A., & Andrade, S. J. (2010). Emerging Hispanic-Serving Institutions (HSIS):

Serving Latino students (Excelencia in Education Research Brief). Retrieved *March*

*1<sup>st</sup>, 2010*, from [http://www.edexcelencia.org/system/files/Emerging\\_HSI.pdf](http://www.edexcelencia.org/system/files/Emerging_HSI.pdf)

U.S. Census Bureau. (2008). *An older and more diverse nation by midcentury* (Publication number CB08-123). Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. *Actual and projected numbers for enrollment in all degree-granting postsecondary institutions, by race/ethnicity: Fall 1993 through fall 2018* [Data file]. Retrieved from

[http://nces.ed.gov/programs/projections/projections2018/tables/table\\_22.asp?referrer=list](http://nces.ed.gov/programs/projections/projections2018/tables/table_22.asp?referrer=list)

Determining Faculty and Student Views: Applications of Q Methodology in Higher Education

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Abstract

William Stephenson specifically developed Q methodology, or Q, as a means of measuring subjectivity. Q has been used to determine perspectives / views in a wide variety of fields from marketing research to political science but less frequently in education. In higher education, the author has used Q methodology to determine views about a variety of situations, from students' views about a newly developed bioinformatics course to faculty members' views of reading circles

as a professional development experience to improve teaching and learning in their classrooms. The purpose of this article is to introduce Q methodology and demonstrate its versatility in addressing research purposes in higher education, especially where the focus is on determining student or faculty perceptions about a topic. Such determinations can be helpful for program evaluation and improved teaching/learning in higher education.

### **Determining Faculty and Student Views: Applications of Q Methodology in Higher Education**

The purpose of this article is to introduce Q methodology and demonstrate its versatility in addressing research purposes in higher education, especially where the focus is on determining people's perceptions and / or grouping people based upon their views. William Stephenson specifically developed Q methodology, or Q, as a means of measuring subjectivity (Brown, 1980, 2008; McKeown & Thomas, 1988; Stephenson, 1953). Q has been used to determine perspectives / views in a wide variety of fields from marketing research to political science (Brown, 1980; McKeown & Thomas, 1988) but less frequently in education (Brown, 1980). In higher education, the author has used Q methodology to determine views about a variety of situations, from students' views about a newly developed bioinformatics course (Ramlo, McConnell, Duan, & Moore, 2008) to faculty members' views of reading circles as a professional development experience to improve teaching and learning in their classrooms (Ramlo & McConnell, 2008).

A Q study begins with the selections of items to be sorted. These items, typically statements related to the topic, often come from qualitative beginnings such as focus groups and interviews (McKeown & Thomas, 1988; I. Newman & Ramlo, 2010). These items are then sorted by participants as they provide their perspectives by sorting these items into a grid, typically with a range such as +5 (most like my view) to -5 (most unlike my view). The participants judge each item

relative to the others as they place them into the grid and rearrange as they desire (Brown, 1980; McKeown & Thomas, 1988; Stephenson, 1953). The sorts are then entered into specialized software for analysis, such as PQ Method (Schmolck, 2002), which produces a variety of informative tables based upon factor analysis results (Brown, 1980; I. Newman & Ramlo, 2010; Schmolck, 2002). In Q, the sorts are factor analyzed such that people with similar views are grouped into factors. Thus, each factor represents a view about the topic (Brown, 1980; McKeown & Thomas, 1988; Stephenson, 1953). Factors are interpreted based upon the tables produced from the analyses of the Q sorts (Brown, 1980; I. Newman & Ramlo, 2010). More information on the process of Q methodology follows along with examples from a variety of studies to assist in describing the application of Q methodology in higher education. We will begin with the Q-sample and the Q-sort.

### The Q-sample

The items are derived from various means including interviews and focus groups (Brown, 1980; McKeown & Thomas, 1988; I. Newman & Ramlo, 2010). The items for the Q sort may consist of anything from statements to pictures (Brown, 1980; McKeown & Thomas, 1988; Stephenson, 1953). In some studies, the statements are created by the researcher or someone involved with the project based upon program goals or other criteria such as with the evaluation of a new bioinformatics course (Ramlo et al., 2008) or of a faculty reading circle program designed to improve faculty's teaching (Ramlo & McConnell, 2008). An earlier study by Ramlo (2005) developed 50 items for sorting by having faculty use a think-pair-share (Lyman, 1992) exercise early within the discussion about the creation of a School of Technology on a university campus (Ramlo, 2005). In that Ramlo (2005) study, participants wrote down two weaknesses, two strengths, and any other concerns about the proposed creation of a School of Technology at a large, public university. Individuals then broke into groups of two or three to discuss what they had

written which then led to a large group discussion. This method led to 50 unique statements for the participants to later sort.

## The Q-sort

Items, such as statements, are typically placed on individual strips of paper. Instructions for the Q sort typically begin by asking the participants to place the statements, as they read them, into one of three piles based on the condition of instruction: (1) More Like My View (2) Neutral (3) Least like my view about the topic. It is helpful if participants can make these piles relatively equal in preparation for the final sort. Once the three piles are created, participants distribute the statements into a grid such as the one shown in Figure 1. Because the items are on individual strips of paper, participants can re-arrange them until they are satisfied that their placements match the participant's view. It is important to note that because participants judge each statement relative to the others based upon their own views, each sort represents the participant's subjectivity about the topic. Because participants interpret each statement, operational definitions and validity are not concerns in Q methodology (Brown, 1980).

# statements that go here	2 statements	3	4	4	4 statements	4	4	3	2 statements
Ranking on grid	-4	-3	-2	-1	0	1	2	3	4
Range	Most unlike my view				Neutral				Most like my view

Figure 1 A Q-sort grid showing the number of statements to be placed within the range from -4 (most unlike my view) to +4 (most like my view).

## The analyses

In Q, the sorts are factor analyzed such that people with similar views are grouped into factors. Each factor represents a view about the topic (Brown, 1980; McKeown & Thomas, 1988;

Stephenson, 1953). The analyses produce a number of descriptive outputs that are interpreted to confirm or explore people's perspectives. Thus, Q methodology shares many of the focuses of qualitative research while utilizing the type of statistical analyses typically found in quantitative studies. In this way, Q methodology fits into the paradigm of mixed methods research (I. Newman & Ramlo, 2010; Stenner & Stainton-Rogers, 2004). As Bazeley (2010) suggests, the integration of qualitative and quantitative research into mixed methods allows the researcher to produce findings that are of greater use and better address the research purpose (I. Newman, Ridenour, Newman, & DeMarco, George Mario Paul Jr., 2003). However, the mixing of qualitative and quantitative methods affects interpretations of research quality (Greene, 2008). For instance, differences in statistical considerations related to grouping people with factor analysis with subjective/qualitative data (Q sorts) versus objective data (Likert surveys) are discussed elsewhere (Stephenson & Burt, 1939). As an example, however, in Q methodology frequently there are misinterpretations about sample size. In Q the sample size is represented by the number of statements sorted, not the number of participants sorting the statements. Thus in Q methodology researchers are concerned about having sufficient number and types of statements to represent the communicability of the topic (Brown, 1980). The number of participants sorting is determined by the purpose of the study (Brown, 1980; I. Newman & Ramlo, 2010; Stephenson, 1953).

### **three Q studies in higher education**

Three distinct studies, each with a different purpose and population, are discussed within this section. Because it is not practical to discuss the results of three studies in higher education in detail, the results and conclusions from several studies are briefly presented within this paper. Each of these studies is published thus readers may find details elsewhere. The purpose of this article is to demonstrate the versatility of Q methodology within higher education. With this in mind, the

author has selected three studies to profile here: Evaluating a new course in bioinformatics; creating a new school of technology; and investigating students' views of learning physics. The study about investigating students' views of learning physics is discussed first. Only this study includes data tables and this is done to help the reader understand the types of information reported within Q and to help interpret the discussions about the subsequent studies contained within the article.

### **Investigating students' views of learning physics**

Our first example is one that focuses on curriculum, teaching, and learning in a first semester physics course for engineering technology majors, both associate and bachelor degree level, at a large Midwestern public university. Considerable research and curriculum development has focused on students' learning of force and motion concepts yet research shows that many students fail to gain Newtonian-based understanding of force and motion concepts (Ramlo, 2008c; Redish, Saul, & Steinberg, 2000; Thornton & Sokoloff, 1998). Research has demonstrated the connection between learning in physics and students' personal epistemologies (Halloun & Hestenes, 1998; Hammer & Elby, 2003; Lising & Elby, 2005). Yet this research has typically used time intensive qualitative methods or Likert scale surveys which can result in loss of meaning (McKeown, 2001). Thus, this study used Q methodology to determine the various perspectives of students related to their learning within a first semester, college physics course.

The use of Likert-scale surveys for a more objective means of assessing epistemological beliefs started in the mid-1980's (Ryan, 1984) and has continued to be popular with the development of instruments such as the survey developed by Schommer (1990). In this study, concourse development started with the items from Schommer's survey and supplemented them with statements taken from student interviews (Ramlo, 2006/2007; Ramlo, 2008a; Ramlo, 2008b). The Q sample consisted of 30 statements related to learning physics.

In this study, first semester college physics students sorted the Q-sample into a grid similar to the one shown in Figure 1, after completing the final exam. The condition of instruction was to sort the statements based upon their view of their learning in this first semester physics course, both lab and lecture. The week before, during the last lab meeting, these same students completed the Force and Motion Conceptual Evaluation (FMCE). They also completed the FMCE during the first lab meeting of the semester. The FMCE is frequently used to determine conceptual understanding of force and motion (Dykstra, Boyle, & Monarch, 1992; Thornton, 1997; Thornton & Sokoloff, 1998) and has been found to be valid and reliable (Ramlo, 2008d).

Eighteen students completed the Q-sort and the FMCE posttest. Analyses of the Q-sorts revealed four factors/views about learning physics in the course. The view represented by those on factor 1 contains the largest factor group from the class, seven students. In contrast, factors 2 and 3 are represented by three participants each. Factor 4 is represented by only one student. Similar factor structure was found in prior studies that used the same Q-sample (Ramlo, 2008a) or a Q-sample that was very similar (Ramlo, 2006/2007).

Table 1 - Correlations between the factors (views) and the FMCE posttest scores

Factor/View	Correlation with Posttest score	Average Posttest score	Standard Deviation	Number of students
1	.463	31	7	7
2	-.393	16	11	3
3	-.171	21	3	3
4	-.318	12	N/A	1

*Notes: The Force and Motion Conceptual Evaluation (FMCE) was used for the posttest and has a maximum of 47 points possible. Only Factor 1 had a positive correlation with the posttest.*



From the correlations shown in Table 1, it is apparent that there is something unique about the view represented by Factor 1. This particular view has a high positive correlation (.46) with the Force and Motion Conceptual Evaluation (FMCE) posttest scores. The remaining views (factors) all have negative correlations with the posttest scores, ranging from -.393 to -.171. The mean FMCE posttest score for Factor 1 is 31 +/- 7 whereas the remaining factors' mean FMCE posttest scores ranged from 12 to 21. Thus, the correlations indicate that the factor 1 view may be important to investigate.

The results from the analyses for all four factors are given in Table 2. This table contains the 30 statements from the Q-sample and their resulting grid positions for each of the four factors/views. Statement grid positions with an asterisk indicate that these statements were distinguishing for that factor when compared to the statement's grid position for each of the other factors.

Table 2 – Statements and their positions for each of the four factors

Statement #	Statement	Factor 1 grid position	Factor 2 grid position	Factor 3 grid position	Factor 4 grid position
1	I see the ideas of force and motion as coherent and interconnected.	1*	-4	-4	-2
2	I think of learning as reconstructing and refining my current understanding.	2	-3	2	-3
3	When my predictions in lab don't match my lab results I question my understanding.	-1	1	0	3
4	I like it when my instructor gives me the answer instead of making me figure it out myself.	-2	3	2	-4
5	I have very little control over how much I learn in this course.	-3	-1	-1	2*
6	In lab, if I don't understand	0	-2	0	1

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	something right away, I will keep on trying until I get it.				
7	Learning something really well takes me a long time in this course.	-3	1*	-3	-1
8	In this course, if I don't understand something quickly, it usually means I won't understand it.	-4*	0	3	1
9	Working with classmates helps me learn in this course & lab.	2	2	-1	-3

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Table 2 – Statements and their positions for each of the four factors (continued)

Statement #	Statement	Factor 1 grid position	Factor 2 grid position	Factor 3 grid position	Factor 4 grid position
10	I can tell when I understand the material in this class.	3	3	1	2
11	I feel comfortable applying what I learned in this class to the real-world.	2	-1	-2	2
12	I like the exactness of math-type subjects.	4	-2*	4	1*
13	What I learn in this class will help me in other classes.	3	1	-2	-2
14	When I don't understand something in my physics lab, I try to figure it out myself.	1	-3	2	-1
15	When I don't understand something in my physics lab, I ask another student to help me understand.	3	2	1	3
16	If I am going to understand something in this course, it will make sense to me right away.	-3*	2	2	3
17	Sometimes I just have to accept answers from my professor even though I don't understand them.	-1*	2	1	-4*
18	What I learn in lab will help me in other classes.	-1	-2	4*	0
19	I am genuinely interested in learning about force and motion.	0	-4*	-1	-1
20	When I don't understand something in my physics lab, I ask my instructor to help me understand.	1*	0*	-4*	4*

Table 2 – Statements and their positions for each of the four factors (continued)

Statement #	Statement	Factor 1 grid position	Factor 2 grid position	Factor 3 grid position	Factor 4 grid position
22	I try to relate my life experiences to the lab activities and/or ideas.	2	0	-3	0
23	Sometimes I found the lab results hard to truly believe.	-4	-1	0	-3
24	Sometimes I find I have problems understanding the terms used in physics.	-2*	3*	1	1
25	My lab results are often consistent with my every day thinking about how things work.	1	0	-2	0

We focus our attention on the grid positions for the Factor 1 statements because this factor is of greatest interest. These +/-4 and +/-3 position statements indicate that those represented by the Factor 1 view were reflective, help seeking, and enjoyed math / problem solving. Those represented by the Factor 1 view also saw the relevance of this physics course and its relationship to future classes they would take in their engineering technology major. These students also did not see learning as immediate (disagree with statements 7, 8, and 16) but did see that they have control over their learning (statement 5).

To further differentiate this view from the remaining three, we consider the distinguishing statements for Factor 1. These statements distinguish this view from the other three views statistically. The examination of the distinguishing statements reveals that Factor 1 students sought a coherent view of force and motion (statement 1) and believed that their learning would take time (statements 8 and 16). It is important to note that only those represented by this view agreed that they sought coherence for the force and motion concepts and disagreed that learning needed to be immediate (statement 16).

Results from this study indicated the need for changes in the lab and course activities for this first semester physics course. For instance, although lab activities ask students to reflect on earlier, related activities, students disagreed that they try to combine these ideas across the lab activities. A need for more effective ways of assisting students in combining these ideas across the lab activities is indicated with this finding. The results of this study also indicate the importance of helping students seek coherence among the concepts of force and motion. The force and motion relationships are stressed throughout the course, including the Realtime Physics Laboratory Activities (Sokoloff, Thornton, & Laws, 2004). Yet this study reveals only those that seek this coherent view become Newtonian thinkers about force and motion. Assessing students' views about learning physics early in the semester may help reveal the need for interventions to assist students to become Newtonian thinkers about force and motion.

### Evaluating a New Bioinformatics Course

Q methodology was used to as part of a program evaluation plan to determine students' views of a bioinformatics course created as part of a National Science Foundation grant (Ramlo et al., 2008). Bioinformatics is, essentially, the application of computational tools to biological data. Thus one of the challenges to creating such an interdisciplinary course was serving the needs and backgrounds of a diverse set of students. Primarily these students were a mixture of computer science and biology students; students were at both the undergraduate or graduate level. In this study, students sorted 29 statements about the course. The two course sections, one spring 2005 and the other spring 2006, were evaluated separately because of changes made to the 2005 course. These changes were based upon the 2005 students' written and verbal feedback.

The results of the analyses of the Q sorts revealed two factors (views) for each of the course sections. Each factor consisted of both computer science and biology students as well as both undergraduates and graduate students. Thus, the views that emerged about the course and the study of bioinformatics were not similar among those with the same major or student status

(undergraduate versus graduate) (Ramlo et al., 2008). This is important to note for program evaluation (McNeil, Newman, & Steinhauser, 2005). The Q methodology results indicated that changes made to the course after 2005 eliminated some students concerns about their learning, primarily related to the computer programming aspects of the course. These course changes also appeared to promote a more a positive view of bioinformatics both academically and as a potential field of study for the students. This type of information may be helpful for others creating bioinformatics courses or programs as well as other inherently interdisciplinary academic opportunities (Ramlo et al., 2008).

### **Faculty Views about the Creation of a School of Technology**

The investigation of faculty views and consensus regarding the creation of a School of Technology at a large Midwestern public university (Ramlo, 2005) demonstrates how Q methodology is a powerful tool for determining consensus and perspectives of a group. In this study, the administration of the university suggested that a School of Technology be created virtually (electronically but not physically) and formed a committee of faculty to investigate this conceptualization, including strengths and weaknesses. This type of organizational change in higher education can prove difficult and time consuming (Bender & Schuh, 2002). Kezar (2005) suggests that successful promotion of organizational change in higher education requires a shared and inclusive process. The use of Q methodology allowed the researcher to make this process efficient as well as inclusive. Comments from the participants included an appreciation for the democratic nature of Q.

As already mentioned, the participants / committee members statements of strengths and weaknesses related to the creation of the School of Technology were used to develop the Q sample that they later sorted. Ten committee members sorted the 50 statements of the Q sample. Analysis via PQ Method (Schmolck, 2002), a program designed specifically for the analysis of Q sorts using Q methodology, revealed three unique views / factors. The tables produced by the Q analyses include

a representative sort for each view. It also produces a table of consensus statements (agreement) among the factors as well as distinguishing statements (those statements that differentiate each factor/ view from the others).

Half of the sorters (5) were represented by factor 1 which possessed a positive view about the creation of the School of Technology. The representative sort for this view as well as the distinguishing statements revealed that this view was extremely positive about the creation of the School of Technology. They were not concerned about details such as funding, location, or name. Instead, this view believed that the creation of the School of Technology would improve programs' images, promote their bachelor degrees, and encourage innovation.

The second factor / view produced was bipolar with two loaders. Thus, persons 1 and 2 on this factor have inverted sorts or, in other words, opposing views. One loader has a positive factor score and the other a negative factor score. Conceptually this is like having one person positively correlated with the factor and the other negatively correlated. The positive loader was cautious about the creation of the School of Technology because of the need for additional resources that may not be included and because the proposed organization is not similar to other schools of technology at other institutions. The negative loader has an inverted view; in other words this person is not concerned about resources and believes that it is good that the School of Technology is not organized like those at other universities. The remaining view represented only one sorter. This view saw the creation of the School of Technology as a marketing opportunity for the pre-existing bachelor degrees that would be associated with the school. This view also saw students as a key component to the choices made about the school as it was organized.

The six consensus statements revealed that all three views agreed that the organization would need to be flexible with constant evaluation and assessment such that changes could be made to improve the School of Technology. Other shared concerns included the ability to market

the School of Technology and its program separately from the university and the potential of an increase in revenue from the programs not being fed back into the School of Technology.

The revealing the differing views within a group is important for collaboration (Clark et al., 1996). In this study, not only did Q reveal the differing views in detail, but it also did this in a efficient manner; this is also important for the type of assessment used to promote organizational change (Bender & Schuh, 2002). Q also determined consensus items which also promoted discussion and collaboration. This consensus, along with the determining of different views, promoted the type of facilitation suggested by Witte and Engelhardt (2004). These findings were supported by committee members' comments about the empowering and democratic feelings they had about the study and its results.

## Conclusions

The findings from this study are unique compared to other studies that investigated students' epistemological views related to learning physics and their conceptual understanding. Unlike the CLASS (Adams, Perkins, Dubson, Finkelstein, & Wieman, 2005; Perkins, Adams, Pollock, Finkelstein, & Wieman, 2005; Perkins, Gratny, Adams, Finkelstein, & Wieman, 2006) and VASS (Halloun & Hestenes, 1996; Halloun & Hestenes, 1998) surveys, this Q methodology study revealed a variety of views about learning physics. Unlike the CLASS studies, students' views were not simply measured relative to the views of selected experts (Adams et al., 2005; Perkins et al., 2005; Perkins et al., 2006). Instead, four unique views were determined from students' sorts that revealed a richer picture of the beliefs about learning physics within the course, including the inquiry laboratories. These perspectives led to modifications within the laboratories and course. Evaluation of students' views of learning physics is ongoing for students enrolled within this first semester physics course.



The bioinformatics study demonstrated that classifying individuals into groups is helpful in various research situations including program evaluation. Using Q methodology to group people based upon their perspectives, using factor analysis to correlate their views as expressed by their Q sorts, is a more effective method of grouping people than using surface characteristics such as race, sex or academic major because surface characteristics do not necessarily determine similar views / perspectives. This is frequently important in program evaluation, where there is often value in addressing the various stakeholder groups differently to ascertain their needs and make effective program improvements (McNeil et al., 2005). In addition, the use of Q methodology also effectively reduces the huge amount of qualitative variables into groupings to better investigate research questions. Thus, it behooves education researchers to learn more about Q methodology and learn about the types of research purposes that Q can be used to address.

Within the School of Technology study, Q methodology allowed the researcher to promote the type of assessment that Bender (2002) describes as optimal for organizational change. She specifically stated that organizational change assessment needs to be effective in that the appropriate issues must be identified, the right questions need to be asked, and collection and analysis of data needs to be efficient. Q methodology demonstrated each of these traits for assessment within this study. The Q results also allowed committee members to feel empowered and that everyone's voice was heard; these feelings are important for effective collaboration (Clark et al., 1996).

In summary, the studies discussed here demonstrate that Q methodology is a powerful tool for determining personal perspectives within higher education. In two of the studies, students' views were determined and then used to make course changes to improve students' learning and attitudes toward the subject. In the third study, faculty collaboration was improved and ideas about organizational change were revealed via the use of Q methodology. Thus, these studies demonstrate the versatility of Q methodology in addressing research purposes in higher education and the importance of determining the

variety of views that exist about a topic, whether that topic is organizational change, a newly developed bioinformatics course, or learning in a first semester college physics course.

## References

- Adams, W. K., Perkins, K. K., Dubson, M., Finkelstein, N. D., & Wieman, C. E. (2005). The design and validation of the colorado learning attitudes about science survey. *AIP Conference Proceedings*, 790(1), 45-48. doi:10.1063/1.2084697
- Bazeley, P. (2010). Computer assisted integration of mixed methods data sources and analyses. In A. Tashakkori, & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (Second ed., pp. TBD). Thousand Oaks, Calif.: SAGE Publications.
- Bender, B. E., & Schuh, J. H. (2002). *Using benchmarking to inform practice in higher education*. San Francisco: Jossey-Bass.
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven, CT: Yale University Press.
- Brown, S. R. (2008). Q methodology. In L. M. Given (Ed.), *The sage encyclopedia of qualitative research methods* (pp. 700-704). Thousand Oaks, CA: Sage Publications.
- Clark, C., Moss, P. A., Goering, S., Hener, R. J., Lamar, B., Leonard, D., . . . Wascha, K. (1996). Collaboration as dialogue: Teachers and researchers engaged in conversation and professional development. *American Educational Research Journal*, 33, 193-231.
- Dykstra, D. I., Boyle, C. F., & Monarch, I. A. (1992). Studying conceptual change in learning physics. *Science Education*, 76(6), 615-652.
- Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7-22. doi:10.1177/1558689807309969
- Halloun, I., & Hestenes, D. (1996). *Views about sciences survey: VASS*

- Halloun, I., & Hestenes, D. (1998). Interpreting VASS dimensions and profiles for physics students. *Science and Education*, 7(6), 553-577.
- Hammer, D., & Elby, A. (2003). Tapping epistemological resources for learning physics. *Journal of the Learning Sciences*, 12(1), 53-90.
- Kezar, A. J. (2005). What campuses need to know about organizational learning and the learning organization. In A. J. Kezar (Ed.), *Organizational learning in higher education* (). San Francisco: Jossey-Bass.
- Lising, L., & Elby, A. (2005). The impact of epistemology on learning: A case study from introductory physics. *American Journal of Physics*, 73(4), 372-382.
- Lyman, F. T. J. (1992). Think-pair-share, thinktrix, thinklinks, and weird facts: An interactive system for cooperative thinking. In N. Davidson, & T. Worsham (Eds.), *Enhancing thinking through cooperative learning* (pp. 169-181). New York: Teachers College Press.
- McKeown, B. (2001). Loss of meaning in likert scaling: A note on the Q methodological alternative. *Operant Subjectivity*, 24, 201-206.
- McKeown, B., & Thomas, D. (1988). *Q methodology*. Newbury Park, CA: Sage Publications.
- McNeil, K. A., Newman, I., & Steinhauser, J. (2005). *How to be involved in program evaluation : What every administrator needs to know*. Lanham, Maryland: Scarecrow Education.
- Newman, I., Ridenour, C. S., Newman, C., & DeMarco, George Mario Paul Jr. (2003). A typology of research purposes and its relationship to mixed methods. In A. Tashakkori, & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 167-188). Thousand Oaks, Calif.: SAGE Publications.

- Newman, I., & Ramlo, S. (2010). Using Q methodology and Q factor analysis to facilitate mixed methods research. In A. Tashakkori, & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (2nd ed., pp. 505-530). Thousand Oaks, CA: Sage Publications.
- Perkins, K. K., Adams, W. K., Pollock, S. J., Finkelstein, N. D., & Wieman, C. E. (2005). Correlating student beliefs with student learning using the colorado learning attitudes about science survey. *AIP Conference Proceedings*, 790(1), 61-64. doi:10.1063/1.2084701
- Perkins, K. K., Gratny, M. M., Adams, W. K., Finkelstein, N. D., & Wieman, C. E. (2006). Towards characterizing the relationship between students' interest in and their beliefs about physics. *AIP Conference Proceedings*, 818(1), 137-140. doi:10.1063/1.2177042
- Ramlo, S. (2005). An application of Q methodology: Determining college faculty perspectives and consensus regarding the creation of a school of technology. *Journal of Research in Education*, 15(1), 52-69.
- Ramlo, S. (2006/2007). Student views of learning in an introductory college physics course: A study using Q methodology. *Operant Subjectivity*, 30(1 / 2), 52-63.
- Ramlo, S. (2008a). Determining the various perspectives and consensus within a classroom using Q methodology. *Physics Education Research Conference Proceedings*, 1064(1), 179-182.
- Ramlo, S. (2008b). Student perspectives on learning physics and their relationship with learning force and motion concepts: A study using Q methodology. *Human Subjectivity*, 2(1), 73-90.
- Ramlo, S. (2008c). Validity and reliability of the force and motion conceptual evaluation. *American Journal of Physics*, 76(9), 882-886.

- Ramlo, S. (2008d). Validity and reliability of the force and motion conceptual evaluation. *American Journal of Physics*, 76(9), 882-886. doi:10.1119/1.2952440
- Ramlo, S., & McConnell, D. (2008). Perspectives of university faculty regarding faculty reading circles: A study using Q methodology. *The Journal of Faculty Development*, 22(1), 25-32.
- Ramlo, S., McConnell, D., Duan, Z., & Moore, F. (2008). Evaluating an inquiry-based bioinformatics course using Q methodology. *Journal of Science Education and Technology*, 17(3), 219-225.
- Redish, E. F., Saul, J. M., & Steinberg, R. N. (2000). On the effectiveness of active-engagement microcomputer-based laboratories. *American Journal of Physics*, 65, 45-54.
- Ryan, M. P. (1984). Monitoring text comprehension: Individual differences in epistemological standards. *Journal of Educational Psychology*, 76(2), 248-258.
- Schmolck, P. (2002). *PQMethod manual mirror*. Unpublished manuscript. Retrieved April 29, 2004, from <http://www.rz.unibw-muenchen.de/~p41bsmk/qmethod/>
- Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology*, 82, 498-504.
- Sokoloff, D. R., Thornton, R. K., & Laws, P. W. (2004). *RealTime physics : Active learning laboratories*. New York: Wiley.
- Stenner, P., & Stainton-Rogers, R. (2004). Q methodology and qualiquantology: The example of discriminating between emotions. In Z. Todd, B. Nerlich, S. McKeown & D. D. Clarke (Eds.), *Mixing methods in psychology* (pp. 101-120). Hove, NY: Psychology Press.
- Stephenson, W. (1953). *The study of behavior: Q-technique and its methodology*. Chicago: University of Chicago Press.

- Stephenson, W., & Burt, C. (1939). Alternative views on correlations between persons. *Psychometrika*, 4, 269-281.
- Thornton, R. K. (1997). Conceptual dynamics: Changing student views of force & motion. *The Changing Role of Physics Departments in Modern Universities, the Proceedings of International Conference on Undergraduate Physics Education*, College Park, Maryland. 241-266.
- Thornton, R. K., & Sokoloff, D. R. (1998). Assessing student learning of newton's laws: The force and motion conceptual evaluation and the evaluation of active learning laboratory and lecture curricula. *American Journal of Physics*, 66(4), 338-352.
- Witte, E. H., & Engelhardt, G. (2004). Towards a theoretically based group facilitation technique for project teams. *Sozialpsychologie*, 52, 2-24.

# **The role of ‘Meeting Pupil Needs and Empowering Staff’ ’ in quality management system**

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## **Abstract**

The study aims to examine the effectiveness of the implementation of ‘Meeting Pupil Needs and Empowering Staff’ in the quality management in Hong Kong primary schools. A case study of nine primary schools was conducted and a qualitative method of interviews was adopted in this study. A total of 9 principals and 9 teachers from 9 primary schools responded to the interviews. The finding shows that ‘meeting pupil needs and empowering staff’ was perceived to be one of least implemented area because most schools’ parents and students were not given any chances to express their opinions on the school policy as to meet their needs. Some teachers could give opinions on school matters but their ideas might not be accepted. The executive committee members were empowered to prepare the budgets, give opinions and make decisions on school policy. Finally, the implication of the study is addressed.

## **1. Introduction**

In Hong Kong, different reports on educational policy for improving local educational quality were published by the Education Commission since 1986. First, it was to maintain the educational quality of the bought place scheme in private schools that the Education Commission Report No. 3 (ECR3, 1988) was published in 1988. The scheme had been phased out in 2000



with the introduction of a direct subsidy scheme for private schools in 1989 to attain a sufficiently high educational standard and to keep minimal government control. Second, it was to address the issues of educational quality, such as teacher quality and school policies on student academic achievements, that the Education Commission Report No. 4 (ECR4, 1990) was published in 1990. The frontier role of teachers would only be successful if the features of school quality management like customer-driven and commitments of all school members could be stressed. Third, it was to aim at quality school education that the Education Commission Report No. 7 (ECR7) was published in 1997. This report continues the SMI's spirit with a different complexion as suggested by the western experience that a succession of policy initiatives and documents over time is the usual norm.

School restructuring policy in the early 1990s in Hong Kong was similar to those in the United Kingdom, and the United States, especially in Australia. The two policy initiatives - the School Management Initiative and the Quality School Education - as wholesale, systematic and coordinated administrative efforts, aimed at reforming the administrative, managerial and school governance aspects of Hong Kong's school system. These policy documents reflect subtle shifts in emphasis over time. The School Management Initiative was driven by a school effectiveness agenda, while the Quality School Education was underpinned by quality education.

Restructuring is an evolutionary process rather than a one-off transformation. The emphases of SMI and ECR7 are different. The SMI aims to introduce a system of SBM based on the school effectiveness research, whereas the ECR7 focuses on developing quality schools possessing quality cultures, and introducing a framework to monitor and assure quality. Thus, the change from 'effective schools' to 'quality schools' is in line with shifts in the western restructuring.

In 1978, Hong Kong implemented a nine-year universal, free and compulsory general education system which was specific to Hong Kong educational environment. This system provided over 90 percent of the children with such opportunities, but the quality of the education system was a concern. 'Rectifying the problems which are inherent in our present education system requires the combined efforts of all relevant people and organisations, including schools, teachers, parents, employers, universities, youth and social workers, and the media to correct misconceptions and promote a proper understanding of quality education' (ED, 1997). Afterwards, the Hong Kong government focused its education policy on improving the quality of education and proposed a comprehensive change of public sector school reform in financial and management strategies and procedures of the administration in 1989. In 1991, the Education and Manpower Branch and the Education Department published the policy document named *The School Management Initiative (SMI): Setting the Framework for Quality in Hong Kong Schools* (EMB&ED, 1991) for setting out the reform of the school system. The SMI document supports Hong Kong's school restructuring with a school effectiveness model, that is, to improve the efficiency and effectiveness of the school management and to achieve better quality of education in all the systems. The Hong Kong's SMI is equivalent to the United Kingdom's local management of schools, school-based management in the United States and the self-managing school in Australia.

Different features of school-based management are being implemented in Hong Kong schools to assure quality. However, experience suggests that the policies of *School Management Initiative* and *Quality School Education* have created many implementation problems resulting in negative perceptions of quality management. It appears that time is inadequate for principal preparation and teacher training programmes to prepare a body of

professionals to cope with the changes required, and the Education Department does not sufficiently promote quality development in schools. School community members have insufficient incentive for schools to take or accept responsibility for achieving quality education. Schools appear to feel discouraged by the inflexible funding and funding levels unrelated to performance. Hong Kong's primary school system has been configured in a unique way because the Education Department is the central bureaucracy. Unlike the private, profit-making schools and those government schools controlled by the Education Department, most aided schools are publicly funded as they operate under a Code of Aid and a Letter of Agreement between the Director of Education and the schools' sponsoring body. School-based management and quality management appear to conflict with the previous practices in local primary schools and school reformers, principals and teachers have to confront several tensions in restructuring. The three main such tensions are: changes in the way of teaching and learning in schools; changes in the occupational situation of educators, like decision-making processes and conditions of teachers' work in schools; and changes in the school governance and the distribution of power between schools and their clients. It is, therefore, worthwhile to investigate what features of quality management are actually being adopted in the local primary schools. Moreover, as the principals are the highest rank and the direct manager of the schools, their perceptions of quality management are also important.

Although the quality school education had been launched in Hong Kong since 1997, it appears that the effectiveness of the quality school education has not been done. The 'meeting pupil needs and empowering staff' is one major feature of quality school education which is identified by ECR7 (1997). The purpose of this study is to investigate the effectiveness of the 'meeting pupil needs and empowering staff' being implemented in Hong Kong. An interview

qualitative study was used and a case study of nine primary schools were conducted. Nine principals and nine teachers from nine primary schools principals responded to interviews. More specifically, this study aims to investigate the following research question, as perceived by principals and teachers:

1. How effective is the implementation of 'Meeting Pupil Needs and Empowering Staff ' in Hong Kong primary school?

## 2. Theory context

Advanced countries have continuously implemented educational changes to improve educational quality. These changes included innovative school-based curriculum with activities and new teaching approaches, school improvement plans, shared decision-making among principals, teachers, parents and students, change of school management (David, 1989; Cheng, 1991; Caldwell & Spinks, 1998), and development of ISO 9000 (Moreland and Clark, 1998; Quinn et al., 2009). These changes in the educational service were influenced by the results of quality management (QM), with the pursuit of quality (Peters and Waterman, 1982) being the means to the effective end in the commerce and manufacturing organisational sectors. Several convincing research findings also demonstrated the importance of pursuing quality management (Juran, 1979; Crosby, 1979, 1986; Deming, 1986; Feigenbaum, 1987; Collard, 1990). Quality management (QM) had taken root in commerce and industry. Its applicability to education came to be widely recognised and accepted by school management theorists.

Education is coming to recognise the need to pursue the sources of quality and to deliver it to students. The sources of quality in education are said to include, in an appropriate

combination, well-maintained buildings; outstanding teachers; high moral values; excellent examination results; specialisation; parental support; business and local community; plentiful resources; the application of the latest technology; strong and purposeful leadership; cares and concerns for students; a well-balanced curriculum.

In Hong Kong, school-based management comprises such elements as (EC, 1997:17): '(i) development of formal procedures for setting school goals and evaluating progress towards these goals; (ii) provision of documents to outline the schools' profiles, development plans and budgets, and means of evaluating progress; (iii) preparation of written constitutions for the school management committees; (iv) participation of teachers, parents and alumni in school management, development, planning, evaluation and decision-making; and (v) development of formal procedures and resources for staff appraisal with effective quality assurance mechanism for schools and staff development according to teachers' needs'.

The introduction of School Management Initiative offers a school-based management framework implemented by all schools in 2000 for continuous school improvement with enhancement of quality school education and greater flexibility in the use of resources based on the individual student needs and characteristics. However, evidence found that a major problem in the school system was the lack of a quality culture (EC, 1997). Evidence also shows that many schools have no development plans linked to goal achievement, no clear targets for both academic and non-academic students, and no appraisal systems to assess the performance of principals and teachers. Moreover, the support to schools is poor in promoting a quality culture. It is also inadequate for principal preparation and teacher training programmes to prepare a body of professionals to cope with the changes required, and the Education Department does not promote quality development in schools. School community members could have insufficient

incentive for schools to take or accept responsibility for achieving quality education. Schools feel discouraged by the inflexibility in funding and the funding levels unrelated to performance. Little recognition of the ‘value-added’ efforts made by schools is given to develop their students’ potential. It is, therefore, the proposals of the ECR7 suggested a strategy of 35 points regarding implementation and reorganised into six groups of strategy: (1) a framework for developing and monitoring quality school education; (2) preparing for quality school education; (3) assessment of performance; (4) incentives to encourage quality school education; (5) school-based management; and (6) funding flexibility.

This study is focused on the major feature ‘meeting pupil needs and empowering staff’ which is identified from ECR7 (1997). The detail of this feature is outlined below:

Meeting pupil needs and empowering staff can be explained in terms of meeting customer needs, listening to customers, managers’ responsiveness, and empowering staff.

**Meeting Customer Needs.** Quality in business equals customer satisfaction (Hutchins, 1990). Quality consists of meeting customers’ stated needs and requirements for providing a product or service (West-Burnham, 1992). Quality management as customer-driven quality makes products or services explicit for meeting or exceeding the expectations of customers (Murgatroyd and Morgan, 1993). TQM includes all work relationships for customer satisfaction and quality for conformity to customer requirements. TQM involves assessing customer needs and expectations, producing quality outputs to meet customer’s satisfaction, and documenting the returns of quality investments by directly linking quality education outputs with inputs of time, money and effort (Weller, 1998). Educationalists like Kohn (1993) feared that TQM would ignore the needs of student learning by reducing it to fiscal terms. However, according to West-Burnham (1992), the

components of meeting customer requirements in schools include (a) understanding of customers' values; (b) attitudes as reflected in the language, involvement and commitment of the school's customers; (c) effective communication appropriately match with customers' educational level; (d) meeting customer expectations with school to share and express high expectations; (e) preferences negotiated, developed and established on the basis of customers' feedback on issues like uniform, pattern of the school day, sex education, religious education, etc; (f) social situation with prevailing patterns of culture, the ethnic balance, unemployment, the economic situation, social advantage and deprivation are significant features in helping to determine a school's response to its community; and (g) commitment of parents is a direct function of the significance attached to education and this will in turn reflect the six components identified above. Thus, in West-Burnham's (1992) diagnostic inventory, effective TQM schools think that 'we meet customer needs' whereas the least effective TQM schools think that 'we teach pupil needs'.

**Listening to Customers.** Quality means putting customers first before developing other things because quality stems from listening to and responding sympathetically to the needs of their customers. Total quality management taking on the human management approach is that organisations should do everything in the interests of their customers (Hutchins, 1990). To meet client expectations and satisfaction, TQM uses public survey to gather information from the public instead of providing information to the public and to obtain continuous feedback on progress, planning and development processes within schools (Bradley, 1993). In schools, an example of listening to customers is through the student council, which represents the interests of students and involves in a variety of aspects of school life, like social activities, curriculum development planning, and timetable discussions. Thus, in West-Burnham's (1992) diagnostic

inventory, effective TQM schools think that ‘we listen to our customers’ whereas the least effective think that ‘we give out information’.

**Managers’ Responsiveness.** The focus of quality education activities should be to become responsive to meeting the needs of students and parents, the main clients of the school (Sackney and Dibiski, 1994). Reynolds and Cuttance (1992) advocate making effectiveness, not efficiency the goal of administration by listening to teachers; not evaluating critically but giving ongoing feedback on work and provision from the monitoring process to the implementation process. Bradley’s (1993) application to education is to remove barriers to worker pride: abolish the annual or merit rating scheme and management by objectives. School principals should seek, receive and consider suggestions from all employees, openly discussed in meetings, regardless of the person’s rank (Townsend, 1997). Thus, in West-Burnham’s (1992) diagnostic inventory, in effective TQM schools ‘senior managers listen and think’ whereas in the least effective TQM schools ‘senior managers administer systems’.

**Empowering Staff.** A sense of empowerment can be caused by participative decision-making shared among the stakeholders at the school-level as active community participation (Clune and White, 1988). Total quality management requires each staff member to be treated as a unique individual, unlike scientific management (Hutchins, 1990). Many who have worked in schools that have adopted this philosophy have seen the same benefits in schools that corporations have found in their workplaces (Murgatroyd and Morgan, 1993). Regardless of rank, principals and staff in such schools were found to be characterized by cooperation and coordination of collegial decision-making; they talked with joy and pride when assumed a close interdependency and trust that was reciprocated; and they clearly perceived as empowered to act when action was needed (Townsend, 1997). The goal of quality education is to empower school staff by providing



authority, flexibility, and resources to solve the educational problems particularly to their schools (David, 1989). Thus, in West-Burnham's (1992) diagnostic inventory, in effective TQM schools 'staff must be empowered' whereas in the least effective 'staff have to be controlled'.

In Hong Kong, for meeting pupils' needs and empowering staff, the school management, including all aided schools and the government schools, should practise SBM by 2000. Teachers, parents and students should be empowered to participate in school management to achieve school goals and formulate long-term plans to meet student needs. The principal can decide with the SMC, teachers and parents with greater flexibility on how to use and allocate the money or funds according to their student needs (EC, 1997). In addition, to maximise rational decision making and administrative efficiency, bureaucracy being an ideal structure for an organisation is characterised by (1) division of labour and specialization; (2) impersonal orientation; (3) hierarchy of authority; (4) rules and regulations: to ensure uniformity and to regulate the behaviour of jobholders; and (5) career orientation (Hoy and Miskel, 1996). Besides, the schools should be effective if they establish an adequate school structure to facilitate the development of the educational processes, to lubricate and fuel the dynamics of interaction within the effective functioning of the whole school system (Purkey and Smith, 1983), to set up managerial, structural and cultural conditions (Creemers, 1993), and to create effective conditions and efforts for uniting all sub-units in the school (Levine and Lezotte, 1990; Scheerens, 1993).

### **3. Research Method**

To investigate the research question, a case study of nine primary schools were conducted and a qualitative methods of interviews and was adopted in this study.

Nine principals and nine teachers from nine schools were involved in interviews. Interviews involve an open-ended set of structured questions in a conversational manner to obtain and record accurately the respondent's valid evidence about human affairs (Yin, 2009). The interview questions were adapted from *Quality Assurance in School Education – Performance Indicators for Primary School* (Education Department, 1998), with modifications of their wordings were adopted as the instrument of data collection for interview to probe the perceptions of principals and teachers. The interview questions were divided into two parts. Part A included four questions on personal information. Part B included two interview questions in which the principals and teachers' perceptions of quality management were revealed (Table 1).

Table 1 – Interview questions

Question number	Description
1	How do you decide if the important decision making greatly concerns with the school or the teachers?
2	How do you think of your school – it is being improved continuously, or it is being good (even very good)? Why do you think so?

The researcher did a pilot study of the interview questions. Two part-time colleagues working as principals in two different primary schools were asked and they suggested that most of the items should be changed. The face-to-face semi-structured, in-depth interview was chosen as the most

suitable method for gathering data. The respondents were the principals and teachers of functional or departmental heads. The selected school principals were contacted individually by phone calls from the researcher while teachers were approached directly by their principals, who also arranged the time, dates and places for the interviews. Each interview lasted, on average, one hour guided by a set of open-ended interview questions at the presence of the researcher. Before the interviews, the researcher explained the purpose of the research and reassured the subjects regarding confidentiality. As the interviewees were well informed beforehand through phone calls, they seemed to feel relaxed and expressed their opinions more freely in a well-prepared room. Out of 12 schools selected, 3 school principals had already run special functions and declined the invitation for interviews at the time of conducting the research. Subsequently, 18 respondents in 9 schools instead of 24 interviews in 12 schools were completed. The return rate of around 75% was assumed to be satisfactory.

#### 4. Findings

**Qualitative Respondents' Personal Demographic Characteristics.** Nine primary schools located in Hong Kong, Kowloon and New Territories were selected and they had been implementing SBM for about 6 years. The schools with a mean of 72 computers provided education for about 817 students with a mean of 60.7% not applying for school textbook fee subsidies in average from primary 1 to 6. They have a mean of about 38 teachers with 96% of trained teachers organised into traditional subject departments, having a principal and two deputy principals. Their school working experience was about 22 years for respondents aged 47. They had been at the school for about 9 years in the present school and the teachers taught in a variety of disciplines. They were 9 principals (8 males and 1 female) and 9 teachers (4 males and 5 females) for about 7 years in the present senior rank of assistant mistress/master, with special responsibilities and roles

like head of department, functional head, level coordinator and administrative teacher as shown in Table 2.

**Table 2** Profile of Qualitative Respondents' Personal Demographic Characteristics

Demographic Characteristics	Categories	Frequency	Percentage	Mean	Std. Dev.
Sex	Male	<b>12</b>	<b>66.7</b>		
	Female	<b>6</b>	<b>33.3</b>		
Educational and Professional Qualification	Bachelor or below	<b>15</b>	<b>83.3</b>		
	Master or above	<b>3</b>	<b>16.7</b>		
Job Position	Principal	<b>9</b>	<b>50.0</b>		
	Assistant Master	<b>9</b>	<b>50.0</b>		
Age				<b>47.4</b>	<b>3.9087</b>
Year in Present Rank				<b>6.9</b>	<b>3.9028</b>
Year of Service				<b>21.6</b>	<b>6.8875</b>
Year of Serving in Present School				<b>8.9</b>	<b>6.3699</b>
Number of Teachers				<b>38.0</b>	<b>7.6485</b>
Percentage of Trained Teachers				<b>96.0</b>	<b>0.0047</b>
Number of Students				<b>817.0</b>	<b>288.3141</b>
Number of computers				<b>72.0</b>	<b>32.0351</b>
Number of years of implementing SBM				<b>5.7</b>	<b>2.9902</b>

The interview data are presented below.

‘Meeting pupil needs and empowering staff’ was perceived to be one of least implemented area because most schools’ parents and students were not given any chances to express their opinions

on the school policy as to meet their needs. Some teachers could give opinions on school matters but their ideas might not be accepted. The executive committee members were empowered to prepare the budgets, give opinions and make decisions on school policy.

Principal D: If important matters arise, I, being the principal, will call a meeting to discuss it with the executive committee members. The matters will then be discussed in the staff meeting. Teachers, not parents and students, can give opinions on the matters of school policy but their ideas may not be accepted.

Teacher J: The executive committee members, not teachers, are empowered to prepare the budgets, give opinions and make decisions on school policy. Their decisions in the executive committee will first be considered and made on meeting students' needs and benefits.

Most schools had achieved some progress as shown by students' more active learning and better-spoken ability. Yet, insufficient resources limited their progresses since teachers were too busy with heavy workloads to work out new change plans.

Principal F: Our school can improve with more progress as we have made improvement to meet the needs of the society. Students become more active in learning and better in spoken ability. Teachers are more enthusiastic, creative, aggressive, committed and supportive of the school missions and development plan.

Teacher B: We, teachers, work well and cooperatively with each other and improve our professionalism in designing the curriculum. However, with insufficient resources, teachers are too busy with the heavy workloads to work out new plans.

## 5. Discussions and implications

Since the publication of the School Management Initiatives by the Hong Kong Education Department in 1991 and School Quality Education in 1997, schools in Hong Kong have gradually changed from external control management to school-based management to improve educational quality and school effectiveness. Teachers and principals have also supposedly changed from the role of employees to partners in the schools. They bear the responsibility for participating positively in the decision making of school policy and implementing the school plan to maintain QM in school.

As found by the present study, ‘meeting pupil needs and empowering staff’ of QM is one of adopted elements perceived by principals and teachers. Most of the schools have a large number of duty lists, committees, teams, subjects and groups headed by senior teachers or vice-principals who are directly responsible to the principal. Almost all organisations are still characterised by bureaucracy. To maximise rational decision making and administrative efficiency, bureaucracy being an ideal structure for an organisation is characterised by as follows: (1) Division of labour and specialisation: each person’s job is broken into simple, routine, and well-defined tasks. (2) Impersonal orientation: sanctions are applied uniformly and impersonally to avoid involvement with individual personalities and personal preferences of members. (3) Hierarchy of authority: each lower office is under the supervision and control of a higher one. (4) Rules and regulations: to ensure uniformity and to regulate the behaviour of jobholders. (5) Career orientation: members are expected to pursue a promotion or a permanent career for this career commitment in the organisation (Hoy and Miskel, 1996:104). It must avoid reliance on bureaucratic processes that stress forms and checklists, as well as mandated components rigidly applied in schools and classrooms. The success of a school depends on a judicious mixture of autonomy for staff

participating in decision-making of various subjects with groups and less control from the central office for a direct autonomy.

As suggested by several scholars that the schools should be effective if they establish an adequate school structure to facilitate the development of the educational processes, to lubricate and fuel the dynamics of interaction within the effective functioning of the whole school system (Purkey and Smith, 1983), and to create effective conditions and efforts for uniting all sub-units in the school (Levine and Lezotte, 1990; Scheerens, 1993). Creemers (1993) also emphasises that the managerial, structural and cultural conditions should be conducive to effective schools. Schools should seek out and consider using materials and approaches that have been successful so that staff are empowered and schools should be given greater autonomy and authority with more flexibility and responsibility for the delegation of financial planning to work out activities to meet pupil needs and to improve pupil academic achievements. Also, more gatherings and more communication channels can be used for teachers to express their opinions and complaints to solve their problems leading to effective management.

#### 6. *Limitations and Recommendations for Future Research*

There are some limitations of the study. First, the sample size is small and only the interviews of nine primary schools were conducted. The study cannot be generalised to all schools involved in the SMI scheme in Hong Kong and may affect the generalisation of the results. But they may provide useful evidence to support the investigation of QM in a larger sample of SBM schools, if not all, in both local and international contexts.

To improve the validity and reliability of this academic inquiry for future researchers, some recommendations are suggested as follows. First, a larger sampling scale with larger size and

more types of schools widely located in the place studied should be recommended because the larger is the scale of the project, the data obtained will be more valid, reliable, representative and generalised of the whole population. Second, other qualitative and quantitative methods, such as observation and survey, can be used in future study. Thus, the educational institutions and educators can base on the results to improve the educational quality. Hopefully, findings of this study can make a contribution to future research and effective implementation of QM in Hong Kong and other places of the world.

## **7. Concluding Remarks**

Since the Education Department's publications of SMI in 1991 and QSE-ECR7 in 1997, primary schools in Hong Kong have changed from the model of external control management to SBM in order to promote the educational quality. Quality management tends to be passive in a culture with the teacher's participation in controlling school management. Some factors including school and student backgrounds, school tradition, school climate and culture, community expectation of the school, still affect quality management on school management effectiveness. Thus, the leadership of principals, teachers and parents in the present complicated and knowledge-changing society should continuously pursue life-long learning for professional development in order to enhance quality management. All these factors have to be taken into account and it is hoped that future researchers will consider them in further studies of educational quality.



## References

- Bradley, L. H. (1993). *Total quality management for schools*. Lancaster: Technomic.
- Caldwell, B. J. and Spinks, J. M. (1988). *The self-managing school*. London: Falmer Press.
- Cheng, Y. C. (1991). Leadership style of principals and organisational process in Hong Kong secondary schools. *Journal of Educational Administration*, 29(2), 15-25.
- Clune, W. H. and White, P. (1988). *School-based management: Institutional variation, implementation and issues for further research*. New Brunswick, NJ: Rutgers University, Eagleton Institute of Politics, Centre for Policy Research in Education.
- Collard, R. (1990). *Total quality, success through people*. London: Institute of Personnel Management.
- Creemers, B. (1993). Development of a theory on educational effectiveness: Testing a multi-level multi-factor, contextual theory about education. *Educational Research Journal*, 8, 1-11.
- Crosby, P. B. (1979). *Quality is free*. New York: McGraw Hill.
- Crosby, P. B. (1986). *Quality without tears: Art of hassle-free management*. Maidenhead: McGraw Hill.
- David, J. L. (1989). Synthesis of research on school-based management. *Educational Leadership*, 46(8), 45-53.
- Deming, W. E. (1986). *Out of the crisis*. Massachusetts: Massachusetts Institute of Technology.
- Education and Manpower Branch and Education Department (EMB&ED) (1991). *The school management initiative: Setting the framework for quality in Hong Kong schools*. Hong Kong: Education Department.
- Education Commission (1988). *Education Commission Report No. 3*. Hong Kong: Education

Department.

Education Commission (1990). *Education Commission Report No. 4*. Hong Kong: Education Department.

Education Commission (1997). *Education commission report no. 7 – Quality school education*. Hong Kong: Education Department.

Education Department (1997). *Report on Review of 9-year Compulsory Education*. Hong Kong: Education Department.

Education Department (1998). *Quality assurance in school education – performance indicators for primary school*. Hong Kong: Education Department.

Feigenbaum A. V. (1987). *Total quality control* (4<sup>th</sup> ed.). New York: McGraw Hill.

Hoy, W. K. and Miskel, C. G. (1996). *Educational administration - Theory, research, practice* (5<sup>th</sup> ed.). New York: McGraw Hill.

Hutchins, D. (1990). *In pursuit of quality: Participative techniques for quality improvement*. London: Pitman.

Juran, J. M. (1979). *Quality control handbook* (2<sup>nd</sup> ed.). New York: McGraw Hill.

Kohn, A. (1993). Turning learning into a business: Concerns about total quality. *Educational Leadership*, 51(1), 58-61.

Levine, D. U. and Lezotte, L. W. (1990). *Unusually effective schools: A review and analysis of research and practice*. Madison: National Center for Effective Schools Research and Development.

Moreland, N. and Clark, M. (1998). Quality and ISO 9000 in educational organizations. *Total Quality Management*, 9(2&3), 311 – 320.

- Murgatroyd, S. and Morgan, C. (1993). *Total quality management and the school*. Buckingham: Open University Press.
- Peters, T. J. and Waterman, R. H. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Harper & Row.
- Purkey, S. C. and Smith, M. S. (1983). Effective schools: A review, *Elementary School Journal*, 83(4), 427-452.
- Quinn, A., Lemay, G., Larsen, P. and Johnson, D.M. (2009). Service quality in higher education. *Total Quality Management & Business Excellence*, 20(2), 139 – 152.
- Reynolds, D. and Cuttance, P. (eds.) (1992). *School effectiveness: Research, policy and practice*. London: Cassell.
- Sackney, L. E. and Dibiski, D. J. (1994). School-based management: A critical perspective. *Educational Management and Administration*, 22(2), 248-258.
- Scheerens, J. (1993). Basic school effectiveness research: Items for a research agenda. *School Effectiveness and School Improvement*, 4(1), 17-26.
- Townsend, T. (ed.) (1997). *Restructuring and quality: Issues for tomorrow's schools*. London: Routledge.
- Weller, L. D. (1998). Unlocking the Culture for Quality Schools: Reengineering. *The International Journal of Educational Management*, 12(6), 250 – 262.
- West-Burnham, J. (1992). *Managing quality in schools: A TQM approach*. London: Longman.
- Yin, R. K. (2009). *Case study research: Design and method* (4<sup>th</sup> ed.). Beverly Hills: Sage.

## **Resiliency and the Individual Demographics of School Leaders: Making a Difference in the Quality of Educational Leadership**

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### ***Abstract***

The purpose of this quantitative study was to investigate the relationships among the dimensions of resilience and the individual demographics of high school principals toward strengthening the leadership abilities of school principals. The study employs the survey method in its research design. Those surveyed included 68 high school principals, from 6 school districts in the State of Florida. The investigation used an on-line questionnaire to collect data on the dimensions of resilience and demographics of these principals. The data were analyzed by using the Independent Sample T-test. Hypothesis testing was introduced to determine statistical significance. The statistical significance level was set at  $p$  (probability)  $< .05$ . The investigation found significant relationships among the resilience dimensions of Positive, Flexible, Organized, Focused and Organized, and the individual demographics of these school principals. The application of the dimensions of resilience can be utilized as a powerful competitive advantage for any educational institution facing major changes. Principals who accept the resilience model reflect greater change adaptability. Resilient principals who manage change successfully not only improve their school's performance but also become more effective leaders. To achieve lasting change, though, they must stay sensitive to the external realities, in this global environment, and encourage faculty, staff and students to be open-minded to the world outside and the boundaries of the school. Therefore, school principals should be ahead of change and not behind it trying to catch up (Kouzes and Posner, 2002).

Throughout history, good educational leadership has been the focus of intense, debate and speculation. Moreover, the importance of the principal as a key factor in the success of a school has rapidly become a major focus of current efforts to improve education. The principal of today and tomorrow faces a rapidly and continuously changing environment.

Schools are aware that they need to adapt to rapidly changing times. Therefore, principals must be more than administrators; they must facilitate change in the school by structuring challenges with reasonable risk to improve their leadership and management skills and the school's progress and success (Osburn, 1993). According to Cunningham and Cordeiro (2000) leadership is about doing the right things, management is doing things right, and the administrator is responsible for both functions. Indeed, administrators are expected to be effective leaders and efficient managers.

Furthermore, principals should also demonstrate high levels of educational leadership to address complex and changing tasks (Whitaker & Turner, 2000). In order to respond creatively, flexibly and quickly to the changing realities of life outside the school, the principal requires certain skills to deal with their circumstances, oversee change and improve student achievement. Conner (1993) posited that the "ability to confront change in a way that maintains or enhances current levels of functioning is a critical element of productive human existence" (p. 89). Garnezy and Masten (1996) maintained that to master change successfully a leader requires psychological and biological strengths, which are called resilience. Although definitions of resilience differ across studies and disciplines, the most common aspects relating to change are the ability to recover; to bounce back; coping and adaptation; willingness and ability to implement change; overcoming adversity; withstand hardship; and strength to confront difficult circumstances.

## **Purpose of the Study**

The purpose of this investigation was to determine relationships among the dimensions of Resilience and individual demographics of high school principals toward strengthening the leadership abilities of the principals. Florida principals are always faced with challenging situations, obstacles, disruption and trauma. Annually, the State is exposed to nature disasters such as hurricanes, tornadoes and floods, which have the potential of destroying houses and school buildings. There are also the influx of retirees with their grandchildren and immigrants whose children have not been taught in the English language. These situations are an additional burden on the educational budget of the state, and consequently principals are compelled to meet these needs with an already shrinking budget. Conner's (1993) research over the years defined seven general dimension of resilience: Positive (Yourself), Positive (The World), Focused, Flexible (Thoughts), Flexible (Social), Organized, and Proactive. Based on this model, Conner (1993) concluded that resilient people have these dimensions in common enabling them to confront the overwhelming obstacles they are bound to face in life. A second part of the investigation asked high school principals to provide individual demographic information about themselves, such as age, gender, marital status, level of education, teaching experience and administrative experience.

Using the above data for high school principals, the investigation attempted to answer the research question below toward meeting the above stated purpose: Are there significant differences among dimensions of resilience (predictor variable) and the individual demographics (criterion variable: it assesses the effect of the predictor variable) of high school principals? The expectation is that there are significant differences among dimension of resilience and the individual demographics of high school principals to become more effective school leaders.

### **Delimitations of the Study**

The investigation had the following delimitations:

1. The investigation included only high school principals from six public school districts in the state of Florida.
2. The participants (school principals) of the investigation were restricted to public high schools in six public school districts.
3. The investigation included only high school principals as the administrator for schools who catered for grades nine through twelve students.

### **LITERATURE REVIEW**

In the rapidly changing environment of the new millennium, school leaders must have the skills and behaviors to guide the development of their leadership capacity and practices to meet the serious challenges in education. In the literature, one may find numerous concepts and approaches to develop and practice good leadership. Because so many variables of personality and context go into the workings of leadership, it is not surprising that people have observed and studied leadership from many different perspectives. By their behavior, leaders earn trust and inspire loyalty. Schools, certainly as much as any other institution, deserve good leadership.

The review of the literature related to the problem is organized around the topic: Resilience.

#### **Construct of Resilience**

The term resiliency, which is derived from the Latin roots meaning, “to jump (or bounce) back,” has no universally accepted definition although most definitions used in the literature are very similar. Definitions have evolved as the concept has been examined independently by researchers from a variety of professional disciplines; the disciplines include psychology,

psychiatry, medicine, epidemiology, nursing, social sciences, human development, and change management. Each definition provides a different perspective or emphasis, yet a common sense of resiliency emerges. Based on the research, most fields viewed resiliency as a human capacity, strength, or ability (Conner, 1993; Joseph, 1994; Henderson & Milstein, 1996; Wolin & Wolin, 1993; Flach, 1988; Pianta & Walsh, 1998; Murphy & Moriarty, 1976; Werner & Smith, 2001; Garmez, 1993; Masten, 1989; Rutter, 1987; Wayman, 2002; Hollister- Wagner, Foshee, & Jackson, 2001).

As indicated in the literature above, certain events evoke the need for resilience, such as adversity; stressful experiences; obstacles or setback; defeat; misfortune; trauma; change; disruption; challenging situations; hardship; behavior problems; physical complications; dysfunctional situation; and crisis. Some researchers have indicated that these factors could be generated either internally or externally (e.g., Colgate, 1995). Several studies in the literature indicate a variety of accelerating events: Higgins (1994) interviewed and conducted psychological tests with 40 adults who endured severe abuse and trauma as children; Moskowitz and Krell (1990) examined the survivors of wars and concentration camps; Werner and Smith (2001) monitored the impact of biological and psychological risk factors, stressful life events, and protective factors on the development of men and women; Wolin and Wolin (1993) studied the long-term consequences of having alcoholic parents; Rutter (1987) conducted a 14-year follow-up study of British women who were placed in an institution as a result of being abused or abandoned as small children; and Conner (1993) observed, recorded and analyzed the behavior of thousands of leaders and managers in organizations as they attempted to implement major change.



Although definitions of resilience differ across studies and disciplines, the researchers attempted to identify some basic features of the concept. The most common aspects are the ability to recover; to bounce back; coping and adaptation; willingness and ability to implement change; overcoming adversity; withstand hardship; and strength to confront.

Outcomes depicted in the resilience studies, include high levels of ego development and a higher economic status than their family (Higgins, 1994); self-discipline (Flach, 1988); and survival of those subjected to war and concentration camp trauma (Moskovitz, 1983). Other outcomes are effective and capable leaders (Conner, 1993; Henderson & Milstein, 1996); growth and development, health and well-being as an outcome (Jones, 1991).

### **Conceptualization of the Construct of Resilience**

Based on this research, it appears that the concept of resilience is mainly dealing with the application to people. It denotes that individuals have certain qualities to enable them to face difficult or devastating circumstances and overcome them. These individuals tend to be socially skillful, well liked and able to solicit support and help from others when needed (Josef, 1994). They are not invincible or invulnerable; they can be hurt or wounded. Conner (1993) stated that resilient people “have a much greater capacity for bouncing back quickly after a shock,” though they “face no less of challenge than others when confronting a crisis.” The concept invokes “positive images such as determined, vigorous, hardy, and irrepressible.

Garnezy and Masten (1986) stated that resilience happens when adaptation and competence occur under conditions in which inadequateness is anticipated. These authors further describe resilience with the concept of “stress-resistance,” which includes a person’s ability to cope with challenges and threats, while maintaining an internal, integrated sense of self (Garnezy & Masten, 1996). Thus conceptualization is further defined as pertaining to

individuals who have the ability to overcome stress (Wayman, 2002). As depicted in the literature review, some of the research studies adequately conceptualized the construct of resilience (e.g., see Werner & Smith, 1982; Rutter, 1987; Flach, 1988; Conner, 1993; Wolin & Wolin, 1993; Bernard, 1993, 1995; Higgins, 1994).

Conner (1993) spent nearly 20 years as a consultant, trainer, and researcher in corporations undergoing organizational change. As result of studying the behavior of people in transition, he and his associates at ODR, Inc. identified characteristics of people who are able to successfully implement major organizational change, including being focused, flexible, positive, organized and proactive. He found that resilient people are more likely to perceive a situation as a challenge and less resilient people are more likely to perceive a situation as a threat.

Based on her review of the literature on resilience, Bonnie Bernard, Prevention Specialist for the Western Center for Drug-Free Schools and Communities at Far West Laboratory for Educational Research and Development, identified the following characteristics of resilient children (Bernard, 1993): social competence, problem-solving, and sense of autonomy. She stated that resilient individuals usually have these attributes in common as indicated in Krovetz (1999).

The research, as depicted from the above studies, suggests that there are qualities in individuals that enable them to face difficulties and overcome them, changed, endured, or resolved in some way. Sagor (1996) concurred by stating that resilience is a set of attributes that provide people with the strength and courage to confront the overwhelming obstacles they are bound to face in life. Thus, for this investigation, resilience conceptualizes the successful adaptation or recovery of an individual despite risk and adversity.

## **Operationalization of the Construct of Resilience**

Resilience is a construct associated with bouncing back from adversity by doing something to change the situation and by managing situations with appropriate skills, behaviors, and qualities so that they no longer seem stressful. Resilient school principals, for example, should be able to flourish under demanding and difficult situations and maintain good and productive human relations at the same time (Abdullah, n.d.).

Drawing from the research on resilience, five characteristics emerge that would help school administrators to move ahead in the face of adversity (Patterson, 2001; Hagevik, 1998; Abdullah, n.d.; Conner, 1993; Bernard, 1995; Higgins, 1994; Henderson & Milstein, 1996; Flach, 1988).

1. Proactive: Resilient people take a proactive approach rather than a reactive or passive approach to problem solving.
2. Positive: Resilient people see major changes or disruptions as uncomfortable but opportunities to grow and develop (Hagevik, 1998; Conner, 1993; Abdullah, n.d.; Patterson, 2001).
3. Focused: Resilient people are focused, committed to life, and maintain a clear vision to purposefully achieve their objectives (Conner, 1993; Flach, 1988; Hagevik, 1998).
4. Flexible: Resilient people have the capacity to believe that change is a manageable process. School administrators who have high levels of flexibility have a high tolerance for ambiguity, and need only a short time to recover from adversity. Several researchers have associated one or more of these characteristics with resilience (Hagevik, 1998; Conner, 1993; Patterson, 2001; Wolin & Wolin, 1993; Bernard, 1993; Henderson & Milstein, 1996; Flach, 1988).

5. Organized: Resilient people have the ability to quickly sort information, build structures in the midst of chaos, plan actions for efficient use of resources, and avoid acting on impulses. A number of studies have found one or more of these characteristics associated with resilience (Conner, 1993; Hagevik, 1998; Bernard, 1993).

Thus, based on this literature review, the operationalization of the construct of resilience for this investigation involves a set of characteristics that could provide school administrators with the strength and courage to overcome challenges and threats, recover from disappointments, and enable effective change management despite facing risks and adversaries.

### **Conner's Model on Resilience**

As depicted from various models in the literature, one can conclude that many of these models have dimensions in common that enable resilient people to confront the overwhelming obstacles they are bound to face in life.

Based on my present review of the literature, Conner's model appears to describe the most comprehensive sense of the dimensions of resilience: Positive (The World), Positive (Yourself), Focused, Flexible (Thoughts), Flexible (Social), Organized, and Proactive.

According to Conner (1993), leadership dimensions of administrators include the areas of perception, thinking, and behavior and appear to be related to the concept of resilience and how people deal with changing circumstances and a changing world.

### **Measuring Resilience**

In 1993, Daryl Conner, a psychologist, studied resilience in organizations for over two decades as a consultant, trainer, and researcher in corporations undergoing organizational change. His extensive consulting over the world has provided him a depth of experience with

change. In addition, his literature on Resilience has been cited in numerous dissertations (e.g., Colgate, 1995 and Taylor, 1997).

Conner and his associates at ODR developed an instrument, the *Personal Resilience Questionnaire* (PRQ) in 1990. The PRQ contains 70 items that measure the five (seven including sub – characteristics) general characteristics that are related to resilience, namely: (a) Positive: (“The World”) and (“Yourself”) (b) Focused (c) Flexible: (“Thoughts”) and (“Social”) (d) Organized (e) Proactive. To date, the instrument has been completed by more than 26,000 people (including employees, managers and leaders) in organizations (ODR, 1996).

The PRQ was selected for this study because the subscales (dimensions) identified in the literature for resilience for school administrators seemed to be a best overall fit to Conner’s model (see above discussion). Also, several research investigations by external researchers (e.g., see Colgate, 1995; Taylor, 1997) and ODR were developed to determine the validity and reliability of the instrument.

## **METHODOLOGY**

### **Purpose of the Investigation**

The purpose of this investigation was to determine the relationships among the dimensions of resilience and the individual demographics of high school principals toward strengthening the leadership abilities of school principals. The specific research question that will be answered is:

- Are there significant differences among the dimensions of resilience and the individual demographics of high school principals?

Information derived from this investigation can be utilized to add to the scholarly

literature in the field of school leadership toward strengthening principal's leadership abilities. Principals used their leadership skills to absorb change while maintaining their productivity as well as their physical and emotional stability to achieve their objectives (Conner, 1993). The results of this investigation served as a basis for school principals to assess their leadership strengths and weaknesses, and used the findings toward the improvement of their leadership abilities

### **Research Design**

This quantitative investigation employed the survey method as its research design. The survey was cross-sectional because the data were collected at one point in time.

Creswell (1994) defines a survey design as a “quantitative or numeric description of some fraction of the population – the sample – through the data collection process of asking questions of people” (p. 117). According to Babbie (1990), the purpose of survey research is to generalize from a sample to a population so that inferences can be made about some characteristics, attitude, or behavior of the population. The survey research approval was elected for this investigation because it possesses all the qualities that are necessary for scientific research, as discussed below.

Considering all the factors, it was decided that an on-line survey method would be administered for this investigation.

### **Participant Selection**

The participants, high school principals, for this study were drawn from all the public high schools in six school districts in the State of Florida. The districts with the most schools were selected for this investigation. Furthermore, districts selected can be viewed as reasonably

representative sample because it represents a balance of urban and rural schools in the State of Florida. For this investigation, the researcher selected the purposive sampling method, also referred to as judgment sampling, for selecting the school districts. According to Gay and Airasian (2000) purposive sampling is based on the researcher's experience and knowledge of the group to be sampled. Thus, the sample of school districts selected for this investigation is based on the researcher's information on the classification of urban and rural areas.

According to the United States Census Bureau, an "urban" area is one that has an overall density of at least 500 people per square mile, while rural areas have less than 500 people per square mile. The districts selected for this study, half urban and half rural, are based on this classification – Duval (1,007 per square mile), Hillsborough (951 per square mile), Orange (988 per square mile), Bay (182 per square mile), Volusia (360 per square mile), and Okaloosa (174 per square mile). Based on the Florida Department of Education 2002-2003 data, the schools listed in the 6 districts are Urban: Duval (19 high schools), Hillsborough (15 high schools), and Orange (15 high schools); Rural: Bay (6 high schools), Volusia (9 high schools), and Okaloosa (4 high schools). Only those schools that are designated as high schools were considered as appropriate for the purpose of this investigation.

Based on the number of principals in the 6 districts, it was determined that all of the principals in the 6 districts would be surveyed. These districts included 49 urban high school principals and 19 rural high school principals.

### **Data Collection Instruments**

The data for this investigation were collected using *The Personal Resilience Questionnaire*. A human subject's application was submitted to the Human Subjects Committee, and approval was given for the data collection. The online questionnaire was sent to 68 high

school principals in the 6 school districts in Florida (Duval, Hillsborough, Orange, Bay, Volusia, and Okaloosa).

The first part of the *Personal Resilience Questionnaire (PRQ)* obtained individual demographic information about school principals, such as age, gender, marital status, level of education, teaching experience, and administrative experience. It captured a single response to each of these variables, as below.

- 1) Age (20 to 30 years, 31 to 40 years, 41 to 50 year, 51years and more).
- 2) Gender (male or female).
- 3) Marital status [single, married, other (divorced or widowed)].
- 4) Level of education (Bachelor, Masters, Specialist, Doctorate).
- 5) Teaching experience (0 to 2 years, 3 to 5 years, 6 to 8 years, 9 years and more)
- 6) Administrative experience (0 to 2 years, 3 to 5 years, 6 to 8 years, 9 years and more).

The second part of the *Personal Resilience Questionnaire (PRQ)* (1993) is a copyrighted scale, and was developed by Daryl Conner and his associates at ODR, Inc. in 1990 (Conner, 1993). The PRQ gathered individual information on the resiliency of principals. The instrument was selected because it is a viable and comparative instrument that exists from earlier research. Also, the subscales (characteristics) identified in the literature for resilience for school principals seemed to be a best overall fit to the ODR model. The instrument was used to assess the seven dimensions of resilience: Positive (The World), Positive (Yourself), Focused, Flexible (Thoughts), Flexible (Social), Organized, and Proactive. The 70 questions in the PRQ reflect the resilience dimensions above.

The response choices for the 70 items are based on a six-point Likert scale; they are: strongly disagree, disagree, slightly disagree, slightly agree, agree, and strongly agree. ODR



made a deliberate decision not to offer a neutral response (e.g., don't know, undecided, unsure) in order to elicit an opinion on each item. The decision created the opportunity for a forced decision by some respondents who would otherwise have chosen the neutral response (Judd, Smith, & Kidder, 1991).

### **Data Collection**

Initially, personal contact was made with the 6 superintendents or their representatives in each of the selected school districts. The principals of these school districts were properly informed and ensured about their anonymity and the confidentiality of the data information. An on-line instrument was sent via the internet to each of these potential participating principals, and they were asked to return the completed questionnaire via the internet.

The data of the PRQ were scored by the researcher and ODR in Atlanta. The database was set up to provide anonymity and confidentiality. The individual demographic data of the principals were captured by the researcher used an Excel spread sheet. The researcher carefully entered the item responses of each survey participant. The item responses and totals for each variable were transported into the "Data Editor" of the SPSS. The scores of the PRQ and Individual Demographics were used to do the statistical analyses.

### **Data Analysis**

The data obtained from this investigation were analyzed with the T- test statistics and using the Statistical Package for the Social Sciences (SPSS) computer program.

The T-test was selected to describe the differences between a normally distributed independent (predictor) variable and another independent (predictor) variable. To answer the research question , the T-test was computed to establish whether or not there were differences among group means of the principals' resilience dimensions and the group means of their

individual demographics. If the statistical significance level has been achieved, the researcher rejects the null hypothesis, and accepts the hypothesis that there are differences among the resilience dimensions and the individual demographics of high school principals. The statistical significance level was set at  $p$  (probability)  $< .05$ . The data used to analyze the research question were obtained from the PRQ.

### **Reliability and Validity of the Personal Resilience Questionnaire (PRQ)**

After two decades of research, recording, observation and analyzing the resilience in organizations, Conner (1993) started to develop a tool to measure the concept of resilience. The items were written to reliably and efficiently illustrate the characteristics; they were designed to measure with minimal overlap between concepts. The questionnaire was also constructed in a way that it captured the span of resilience while minimizing potential sources of partiality. And the wording was written on a seventh grade level. Some of the items (46%) are reverse scored to minimize the possibility of response bias. Careful attention was given to the reliability and validity of the instrument (Conner, 1993).

The validity and social desirability psychometrics of the PRQ were derived from a study on 226 undergraduate students at the Georgia Institute of Technology in 1993. To establish construct validity of the *Personal Resilience Questionnaire* (PRQ), it was determined whether the instrument measured the concepts it was designed to measure. Accordingly, the PRQ measured the seven different constructs of resilience: Positive (The World), Positive (Yourself), Focused, Flexible (Thoughts), Flexible (Social), Organized, and Proactive. By comparing individual scores on the resilience sub-scales to scores on other validated scales that were used to measure the same constructs, Conner confirmed that the Personal Resilience Profile sub-scales

did measure the concepts that they were theoretically designed to measure (ODR, 1996).

By establishing the predictive validity of the PRQ, Conner (1993) wanted to determine whether high scores on the PRQ correspond to high performance of the subjects. Data obtained from 86 employees of a leading financial institution in the midst of a major change; 66 were described as high performers, and the rest were classified as low performers. They compared the scores of these groups on the seven components of resilience, and found that the high performers showed higher scores than the low performers on Positive (The World), Positive (Yourself), Focused, Flexible (Thought), Flexible (Social), Organized, and Proactive. The result suggests that scores on the PRQ can be used to predict job performance in organizations undergoing change, but that relationships may differ across organizations.

Internal consistency reliability for each of the PRQ subscales was computed by using Cronbach's alpha coefficients. Cronbach's alpha coefficient is a mathematical formula that measures the reliability of measurement by estimating the extent to which the measurement provides the same results on repeated trials or it measures how well a set of items or variables (characteristics of resiliency) measures the same underlying construct (resiliency). Cronbach's alpha is a value between 0 and 1. Values near 0 indicate low reliability, while values near 1 indicate high reliability (Crocker & Algina, 1986). The following Cronbach's alpha coefficients were calculated for each sub-scale: Positive (The World) 0.83, Positive (Yourself) 0.81, Focused 0.82, Flexible (Thoughts) 0.71, Flexible (Social) 0.74, Organized 0.68, Proactive 0.65. These figures indicated that the items that make up each scale have a fairly high level of covariance; that is, people tend to respond similarly to the various questions in each scale. This is an indication that the questions constituting a given sub-scale are all measuring the same concept (ODR, 1996)

The internal consistency reliability for the PRQ, the subscales or characteristics of resiliency that measured the construct of resiliency, showed high alpha values. Thus, the psychometrics of this scale indicated that the PRQ exhibited acceptable validity and reliability.

## **DATA ANALYSIS AND RESULTS**

### **Participant Response**

Table 1 illustrates the distribution of the participants' responses in the investigation. From the total sample of 68 school principals, 28 (41.2%) responded and completed the survey.

The participants were each divided into rural and urban settings based on the school district they represented. The rural school districts were Bay, Volusia and Okaloosa Counties. From the sample of 19 rural school principals, 10 (52.6%) responded and completed the survey.

The urban school districts selected for this study were Duval, Hillsborough and Orange Counties. From the sample of 49 high school principals, 18 (36.7%) responded and completed the survey.

### **Findings of Individual Demographics Data Collected from the School Principals.**

As reported in Table 2, frequencies and percentages of these principals were calculated of the demographic data. From the sample of 28 responding principals, 10 females and 18 males responded and completed the surveys. The participants were asked to list their age; 16 (57.1%) were 51 years and older, 11 (39.3%) were between 41 and 50 years and 1 (3.6%) was between 31 and 40 years. The participants' marital status ranged from 26 married, 1 divorced and 1 single. As for the level of education of responding principals, 19 had master's degrees, 6 doctoral

degrees and 3 specialist degrees. The participants were also asked to indicate the number of years of teaching experience, which ranged from 23 (82.1%) with 9 years or more years, 4 (14.3%) between 6 and 8 years, and 1 between 3 and 5 years experience. As for the principals' administrative experience, 18 (64.3%) had 9 years or more, 7 (25%) had between 6 and 8 years, and 3 (10.7%) had between 3 and 5 years experience.

### **Findings of the Research**

The T-test was computed to establish whether or not there were differences among the school principals' resilience dimensions and their individual demographics. Each individual demographic interval was combined in two levels to justify the categorical variable. The statistical significant level was set at  $p < .05$ .

As indicated in the tables below, the researcher found significant differences among the resilience dimensions of:

- Positive: The World (T value of 2.904,  $p = .013$ ) and Proactive (T value of 2.708,  $p = .045$ ) and the individual demographic of age (see Table 3a).

This data suggested that principals of different ages had different views about the resilience dimensions of Positive: The World and Proactive. According to the descriptive data, the researcher concluded that principals under 50 years of age (mean score of 54.0) are more likely to apply the Positive: The World resilience dimension than those over 50 years of age (mean score of 51.38). While principals over 50 years of age (means score of 62.75) are more likely to apply the resilience dimension of Proactive than those under 50 years of age (mean score of 61.17), in their leadership approach.

- Focused (T value of 2.712,  $p = .043$ ) and Flexible: Social (T value of 2.323,  $p = .049$ ) and the individual demographic of gender (see Table 3b).

This data suggested that female principals (mean score of 56.20) are more Focused than male principals (mean score 54.22) in their leadership approach. While male principals (mean score 60.78) are more Flexible: Social than female principals (mean score 59.80) in their leadership approach.

- Positive: The World (T value of 2.934,  $p = .040$ ) and Flexible: Social (T value of 2.411,  $p = .010$ ) and the individual demographic of level of education (see Table 3c).

The data suggested that principals with master's and bachelor's education levels (mean score of 54.32) were more likely to apply the Positive: The World resilience dimension than principals with specialists and doctoral levels of education (mean score of 48.67). Likewise, principals who have master's and bachelor's education levels (mean score of 61.79) were more likely to apply the Flexible: Social resilience dimension than principals with specialist or doctoral level of education (mean score of 57.56), in their leadership approach.

- Positive: The World (T value of 2.646,  $p = .012$ ), Focused (T value of 2.814,  $p = .018$ ) and Flexible: Thoughts (T value of 2.896,  $p = .006$ ) and the individual demographic of teaching experience (see Table 3d).

The data suggested that principals with 9 or more years of teaching experience were more likely to apply the resilience dimensions of Positive: The World (mean score of 53.57), Focused (mean score of 56.0) and Flexible: Thoughts (mean score of 59.91) than principals with [(Positive: The World, mean score of 47.60) (Focused, mean score of 50.0), (Flexible: Thoughts, mean score of 54.40)] with less than 9 years of teaching experience in their leadership approach.

- Focused (T value of 2.078,  $p = .048$ ) and Proactive (T value of 2.743,  $p = .033$ ) and the individual demographic of administrative experience of high school principals (see Table 3e).

The data suggested that principals who have between 3 and 8 years of administrative experience (mean score of 58.40) were more Focused in their leadership approach than principals with 9 or more years of administrative experience (mean score of 53.0). Furthermore, principals with 9 or more years of administrative experience (mean score of 63.44) were more Proactive in their leadership approach than principals with less than 9 years of administrative experience (mean score of 59.60).

Table 4 displays all of the significant relationships of the Research Question. The researcher rejected the null hypotheses that there were statistical significant differences among the resilience dimensions of: Positive: The World and Proactive and the individual demographic of age; Focused and Flexible: Social and the individual demographic of gender; Positive: The World and Flexible: Social and the individual demographic of level of education; Positive: The World, Focused and Flexible: Thoughts and the individual demographic of teaching experience; and Focused and Proactive and the individual demographic of administrative experience of high school principals.

## **CONCLUSION AND RECOMMENDATIONS**

Based on the research question and the analysis of data, the following conclusions can be drawn as result of this investigation.

1. Significant differences exist among the resilience dimensions of: Positive:

The World and Proactive and the individual demographic of age (see Table 3a). A Positive: The World principal: a) focuses on the positive view of environments, b) sees the environment as complex and challenging, c) sees opportunities and possibilities, d) is optimistic. An Proactive principal: a) acting decisively in the midst of uncertainty, b) taking risks and endure the

discomfort involved, c) seeking challenges rather than avoid them, d) investing energy rather than withdraw.

The researcher concluded that principals of different ages have different views about the resilience dimensions of Positive: The World and Proactive. According to the descriptive data, the researcher concluded that principals under 50 years of age (mean score of 54.0) are more likely to apply the Positive: The World resilience dimension than those over 50 years of age (mean score of 51.38). While principals over 50 years of age (means score of 62.75) are more likely to apply the resilience dimension of Proactive than those under 50 years of age (mean score of 61.17), in their leadership approach.

2. Significant differences exist among the resilience dimensions of Focused and Flexible: Social and the individual demographic of gender (see Table 3b).

Focused principals are: a) strongly committed to the goals, b) find meaning or purpose, c) have a sense of purpose and priorities, d) have clarity of purpose, e) have a sense of direction in life.

Flexible: Social principals are: a) able to draw on resources of others to supplement their own flexibility, b) recognize interdependency with others, c) able to form and maintain close relationships, d) recognize how others' skills can complement their own.

The researcher concluded that female principals (mean score of 56.20) are more Focused than male principals (means score 54.22) in their leadership approach. While male principals (mean score 60.78) are more Flexible: Social than female principals (mean score 59.80) in their leadership approach.

3. Significant differences exist among the resilience dimensions of Positive: The World and Flexible: Social and the individual demographic of level of education (see Table 3c). The



researcher concluded that principals with master's and bachelor's education levels (mean score of 54.32) are more likely to apply the Positive: The World resilience dimension than principals with specialists and doctoral levels of education (mean score of 48.67). Likewise, principals who have master's and bachelor's education levels (mean score of 61.79) are more likely to apply the Flexible: Social resilience dimension than principals with specialist or doctoral level of education (mean score of 57.56), in their leadership approach.

4. Significant differences exists among the resilience dimensions of Positive: The World, Focused and Flexible: Thoughts and the individual demographic of teaching experience (see Table 3d). Flexible: Thoughts principals:

- a) cope with ambiguity comfortably,
- b) able and willing to look at situations from multiple points of view and suspend judgment,
- c) accept paradoxes and contradictions,
- d) are open-minded,
- e) creative in finding effective ways to achieve goals.

The researcher concluded that principals with 9 or more years of teaching experience are more likely to apply the resilience dimensions of Positive: The World (mean score of 53.57), Focused (means score of 56.0) and Flexible: Thoughts (mean score of 59.91) than principals with [( Positive:TheWorld, mean score of 47.60) (Focused, mean score of 50.0), ( Flexible: Thoughts, mean score of 54.40)] with less than 9 years of teaching experience in their leadership approach.

(e). Significant differences exist among the resilience dimensions of Focused and Proactive and the individual demographic of administrative experience (see Table 3e) of high school principals.

The researcher concluded that principals who have between 3 and 8 years of administrative experience (mean score of 58.40) are more Focused in their leadership approach than principals with 9 or more years of administrative experience (mean score of 53.0). Furthermore, principals with 9 or more years of administrative experience (mean score of 63.44) are more Proactive in their leadership approach than principals with less than 9 years of administrative experience (mean score of 59.60).

### **Implications**

The study revealed that school leaders must develop or learn the resilient characteristics such as Positive, Proactive, Focused, Organized and Flexible to guide the development of their leadership capacity and practices to meet the serious challenges in education.

Given the increasingly demanding environment, universities that prepare administrators, and school districts that employ school leaders should strive to create support mechanisms designed to increase administrator resiliency. The stimulus of continuous, high quality professional growth may help to increase the resiliency of school leaders. Resiliency among school leaders can be enhanced through the creation of supportive structures and norms within school districts. Attention to team-building, effective coaching and the creation of a culture that challenges, energizes and rewards leaders appear to be helpful in enhancing the resiliency of school leaders. Ongoing professional growth also appears to be a key factor in building resiliency.

Conner (1993) stated that the single most important factor in managing change successfully is the degree to which people demonstrate resilience. He maintained that resilience is the willingness and capacity of a leader to absorb high levels of change while demonstrating an insignificant dysfunctional performance. Thus, the assumption by followers is that resilient

principals are better prepared to protect them and the school from the fast-changing world because they have the capacity to absorb high levels of change. Change is a difficult process but one way or another all schools have to face it at one point. .

Thus, the resilient principal should assist and support his or her faculty, staff, students, parents and the community to challenge the process by creating change to enable the school to be proactive and increase the potential for a successful education system (Lick & Kaufman, 2001). Principals who accept the resilience model reflect greater change adaptability. Resilient principals who manage change successfully not only improve their school's performance but also become more effective leaders. Therefore, principals should be ahead of change and not behind it trying to catch up (Kouzes and Posner, 2002).

### **Limitations of the study**

1. This was the first study conducted on the relationships among the dimensions of resilience and the individual demographics of high school principals. In view of the small sample size, a similar follow-up study could be conducted on more schools and involving more school districts, and more school principals from schools and school districts.
2. The school districts were not randomly selected; therefore the study population may not be fully representative of the population.
3. The unique nature of the State of Florida's socioeconomic, ethnic and diverse culture may limit generalization of the conclusions of this study to other populations. As a result, caution should be taken in applying the investigation's conclusions to the populations of other states and countries.
4. There were limited responses from the schools in the districts because the principals,

assistant principals and teachers are inundated with surveys from other researchers, educational institutions and the district offices. Additionally, principals have several administrative, curriculum and extra curricular activities.

5. The research data were collected from a limited pool of schools in 6 school districts, so the results may not be generalizable but only valid for those districts.

### **Recommendations for Future Study**

The following recommendations are made regarding the value of future research in this area.

1. More research is needed on resiliency in education because it is a critical component to successfully managing change. Resilient people are not only able to “bounce back” from change, but also come through even stronger and more capable than before; they are less likely to become victims of change. Resilient people more often accomplish their goals timely while not losing quality. In the face of uncertainty, particularly during budget cuts and restructuring, they tend to achieve their objectives and maintain their physical and emotional health.
2. The study can be modified to allow for a combination of both quantitative and qualitative approaches. The data could be collected through surveys, interviews, observations and focus groups, and the results obtained could help the researcher to answer several research questions such as, the impact resilient principals have on school performance or the quality of the judgments a resilient principal makes while addressing difficult issues.
3. A similar study could be done by determining the relationships among the dimensions of resilience, leadership practices, and individual demographics of elementary school principals.

4. School districts should more often engage principals in related research projects to enhance their professional development skills and strengthen their skills in effectively serving as school leaders.

5. School districts should consider the results of this study and conduct similar research on resiliency development to engage principals in effective organizational functioning to enhance their leadership abilities.

6. This study should be replicated to include superintendents or managers at the district offices. This would enable them to strengthen their leadership to improve public schools.

7. Finally, in view of the small body of literature available on the resiliency of adults in education, more research studies could be done in educational settings because successful change management is not merely an opportunity to improve organizational performance, but it also reflects a responsibility to apply what a person knows about his or her particular field.

## REFERENCES

- Abdullah (n.d.). *Enhancing educators' personal resilience: A way towards education excellence*. Unpublished manuscript, University of Malaya, Faculty of Education. Retrieved on March 8, 2002 from <http://www.planetklik.com.my/SG/semp13.htm>.
- Ahn, R.L. (1991). *Development and validation of the Washington Resilience Scale*. Unpublished doctoral dissertation, University of Washington..
- Babbie, E.R. (1990). *Survey research methods*. (2nd ed.). Belmont, CA: Wadsworth Publishing Company.
- Bennett, E.B., Novotny, J.A., Green, K.E, & Kluever, R.C.(1998). *Confirmatory factor analysis of the Resiliency scale*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
- Bernard, B. (1993). *Fostering resiliency in kids*. Educational Leadership, 44-48.
- Biscoe, B., & Harris, B. (1994). *Evaluation reports. 1994-1998, new destiny, women and children's residential treatment program*. Oklahoma City: Eagle Ridge Institute.
- Block, J.H. & Block, J. (1980). *The role of ego-control and ego-resilience in the organization of behavior*. In W.A. Collins (Ed.). *Development of cognition, affect, and social relations: Minnesota symposia of child psychology (pp 39-101)*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Colgate, M.A. (1995). *A secondary analysis assessing the Personal Resilience Questionnaire exploring the relationship between resilience and exercise*. Unpublished doctoral dissertation, University of Maryland, College Park.
- Conner, D. R.(1993). *Managing at the speed of change: How resilient managers succeed and prosper where others fail*. New York: Villard Books.

- Creswell, J.W. (1994). *Research design*. Thousand Oaks, California: SAGE Publications.
- Crocker, L. & Algina, J.(1986). *Introduction to classical and modern test theory*. New York: Holt, Rinehart and Winston.
- Cunningham, W.G., & Cordeiro, P.A. (2000). *Educational administration. A problem – based approach*. Boston: Allyn and Bacon.
- Demos, E.V. (1989). *Resiliency in infancy*. In T.F. Dugan & R.Coles (Eds.). *The child in our times: Studies in the development of resiliency (pp. 3-22)*. New York: Brunner/Mazel, Inc. 144
- Dugan, T. F. & Coles, R.(Ed.) (1989). *The child in our times. Studies in the development of resiliency*. New York: Brunner/Mazel, Inc.
- Flach F. (1988). *Resilience: Discovering a new strength at times of stress*. New York: Fawcett Columbine.
- Folkman, S. & Lazarus, R.S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of college examination. *Journal of Personality and Social Psychology*, 54, 466-475.
- Folkman. S & Lazarus, R.S. (1988). Coping as a mediator of emotion. *Journal of Personality and Social Psychology*, 54, 466-475.
- Follet, M.P.(1981). The essentials of leadership. In *The Great Writings of Management and Organizational Behavior (2nd)*, edited by Louis E. Boone and Donald D. Bowen (1987). New York: McGraw – Hill, Inc., p. 49-59.
- Garnezy, N. (1974). Children at risk: The research for the antecedents of schizophrenia. Part II: Ongoing research programs, issues, and intervention. *Schizophrenia Bulletin*, 1, 9, 55- 25.
- Garnezy, N. (1993). *Children in poverty: Resilience despite risk*. *Psychiatry*, 56, 127-136.

Garmezy, N. & Masten, A.S.(1986). Stress, competence, and resilience: Common frontiers for therapist and psychopathologist. *Behavior Therapy*, 17, 500 - 521.

Gay, L.R., & Airasian, P.(2000).*Educational research* (6th ed.). Columbus, Ohio: Prentice –Hall.

Hagevik, S. (1998). Resilience required. *Journal of Environmental Health*,. 60, 10, 37.

Hartford, S.C. (2000). Employ perceptions of leader credibility and its relationship to employee communication satisfaction and Health Care Organization. *Doctoral dissertation*, Southern Illinois University at Carbondale.

Henderson, N., & Milstein, M.M. (1996). *Resiliency in schools: Making it happens for students and educators*. Thousand Oaks, CA: Corwin Press.

Higgins, G.O. (1994). *Resilient adults: Overcoming a cruel past*. San Francisco: Jossey – Bass. Inc.

Hollister-Wagner, G.H., Foshee, A.V. & Jackson, C. (2001). Adololcent aggression: models of resiliency. *Journal of Applied Social Psychology*, 31, 3, 445-466.

Jones, P.S (1991). *Adaptability. a personal resource for health. Scholarly inquiry for nursing practice*. An International Journal, 5, 95-108.

Joseph, J.M. (1994). *The resilient child: Preparing today's youth for tomorrow's world*. New York: Plenum Press.

Judd, C.M., Smith, E.R., & Kidder, L.H. (1991). *Research methods in social relations*. Chicago, IL: Holt, Rinehart and Winston. 146

Kouzes, J.M., & Posner, B.J. (2002). *Leadership challenge (3rd Ed.)*. San Francisco: Jossey-Bass.



- Krovetz, M.L. (1999). Fostering resiliency. *Thrust for educational leadership*, 28,5.  
Bloomington, Indiana: Phi Delta Kappa Educational Foundation.
- Lick, D.W., & Kaufman, R. (Winter 2001/2001). Change Creation: The rest of the planning story. *Planning in Higher Education*, 29, 2, p. 30.
- Masten, A.S. (1989). *Resilience in development: Implications of the study of successful adaptation for developmental psychopathology*. In D.Cicchetti (Ed.). The emergence of a discipline: Rochester symposium on developmental psychopathology (pp. 153-183). Hillsdale, NJ.: Lawrence Erlbaum Associates.
- Moos, R.H., & Billings, A.G. (1994). *Conceptualizing and measuring coping resources and processes*. In L.Goldberg & S. Breznitz (Eds.). Handbook of stress: The theoretical and clinical aspects (pp. 212-2, 30). New York: Free Press. 147
- Murphy, L.R., & Moriarty, A. (1976). *Vulnerability, coping and growth from infancy to adolescence*. New Haven: Yale University Press.
- Moskowitz (1983). *Love despite hate: Child survivors of the holocaust and their adult lives*. New York: Schocken Books.
- Moskowitz, S., & Krell, R. (1990). Child survivors of the holocaust: Psychological adaptations to survival. *Israel Journal of Psychiatry and Related Sciences*, 27, 81- 91.
- Murphy, L.R., & Moriarty, A. (1976). *Vulnerability, coping and growth from infancy to adolescence*. New Haven: Yale University Press.
- ODR. Inc., (1994a). The personal resilience profile handbook. In M.A. Colgatge. *A secondary analysis assessing the Personal Resilience Questionnaire exploring the relationship between resilience and exercise*. Unpublished doctoral Dissertation, University of Maryland, College Park.

- ODR. Inc., (1996). *Section(IV) Technical Information*. Atlanta: Author.
- ODR. Inc., (2001). ODR Personal resilience profile feedback. Atlanta: Author.
- Osburn, F.W. (1993). Principal perceptions of rewards and organizational characteristics as incentives to assume leadership in school improvement. Doctoral dissertation, Florida State University, 1993).*Dissertation Abstracts Interntional*, 54, 02A.
- Patterson, J. ( 2001). Resiliency in the face of adversity. *The School Administrator*. Available from the American Association of School Administrators, Virginia. Retrieved from [Http://www.aasa.org](http://www.aasa.org)
- Peacock, E.J., & Wong, P.TP. (1990). The stressful appraisal measure: A multidimensional approach to cognitive appraisal. *Stress Medicine*, 6, 227-236.
- Pianta, R.C. & Walsh, D.J. (1998). Applying the construct of resilience in schools: cautions from a developmental systems perspective. *The School Psychology Review*, 27, 3, 407-417.
- Rotter, J.B. ( 1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1-28.
- Rutter, M.(1987). *Psychosocial resilience and protective mechanisms*. American Journal of Orthopsychiatry, 57, 316-331.
- Sagor, R. (1996). Building resiliency in students. *Educational Leadership*, 54, 38-43.
- Wang, C.W. & Gordon, E.W.(Ed.) (1994). *Educational resilience in Inner City America: Challenges and prospects*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Wayman, J.C. (2002). The utility of educational resilience for studying degree attainment in school dropouts. *The Journal of Educational Research*, 95, 3,167-178..
- Werner, E.E. & Smith, R.S. (2001). *Journeys from childhood to midlife: Risk resilience, and recovery*. New York: Cornell University Press.

Whitake, T., & Turner, E. (2000). What is your priority? *Bulletin*, 84, 16.

Wolin, S.J. & Wolin, S. (1993). *The Resilient Self: How survivors of troubled families rise above adversity*. New York: Villard Books

Wright, N.D. (2002). *From risk to resiliency: The role of Law-Related Education*.

*Retrieved from <Http://www.civiced.org/normarr.htm>150.*

Table 1

*Summary of Surveys Mailed, Number Responded and Percentage of Responses.*

<b>Participants</b>	<b>Number mailed</b>	<b>Number responded</b>	<b>Percentage of Responses</b>
<b>Principals</b>	<b>68</b>	<b>28</b>	<b>41.2</b>
Urban	49	18	36.7
Rural	19	10	52.6

Table 2

*Individual Demographic Differences of High School Principals. (n = 28)*

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
Age	16 (51 years or more)	57.1
	11 (between 41 and 50)	39.3
	1 (between 31 and 40)	3.6
Gender	10 Females	35.7
	18 Males	64.3
Marital status	26 Married	92.8
	1 Divorced	3.6
	1 Single	3.6
Level of Education	19 Master degrees	67.9
	6 Doctoral degrees	21.4
	3 specialist degrees	10.7
Teaching Experience	23 (9 years or more)	82.1
	4 (between 6 and 8 yrs)	14.3
	1 (between 3 and 5 yrs)	3.6
Administrative Experience	18 ( 9 years or more)	64.3
	7 (between 6 and 8 yrs)	25
	3 (between 3 and 5 yrs)	10.7

Table 3a

*Independent Sample T-test Between Resilience Dimensions and the Individual Demographic of Age of High School Principals.*

<b>Resilience Dimensions</b>	<b>T</b>	<b>Df</b>	<b>Sig.(2-tailed)</b>
Positive: The World	2.904	26	0.013*
Positive: Youself	0.382	26	0.705
Focused:	0.153	26	0.879
Flexible: Thoughts	0.052	26	0.959
Flexible: Social	0.241	26	0.811
Organized	0.122	26	0.904
Proactive	-2.708	26	0.045

\*p < .05

Table 3b

*Independent Sample T-test Between Resilience and the Individual Demographic of Gender of High School Principals*

<b>Resilience Dimensions</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>
Positive: The World	-1.320	26	0.198
Positive: Yourself	0.627	26	0.536
Focused	2.712	26	0.043*
Flexible: Thoughts	-0.459	26	0.650
Flexible: Social	-2.323	26	0.049*
Organized	-0.140	26	0.889
Proactive	-0.722	26	0.477

\*p < .05

Table 3c

*Independent Sample T-test Between Resilience and the Individual Demographic of Education level of High School Principals.*

<b>Resilience Dimensions</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2 tailed)</b>
Positive: The World	-2.934	26	0.040*
Positive: Yourself	-0.263	26	0.795
Focused	-0.134	26	0.39
Flexible: Thoughts	0.106	26	0.917
Flexible: Social	-2.411	26	0.010*
Organized	-1.058	26	0.300
Proactive	0.230	26	0.820

\* p < .05

Table 3d

*Independent Sample T-test Between the Resilience and the Individual Demographic of Teaching Experience of High School Principals.*

<b>Resilience Dimensions</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>
Positive: The World	-2.646	26	0.012*
Positive: Yourself	-0.721	26	0.477
Focused	2.814	26	0.018
Flexible: Thoughts	-2.896	26	0.006*
Flexible: Social	-0.137	26	0.892
Organized	0.035	26	0.972
Proactive	-1.054	26	0.302

\*p< .05

Table 3e  
*Independent Sample T-test Between Resilience and the  
 Individual Demographic of Administrative Experience of High School Principals.*

<b>Resilience Dimensions</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>
Positive: The World	0.670	26	0.509
Positive: Yourself	-0.260	26	0.797
Focused	2.078	26	0.048*
Flexible: Thoughts	0.423	26	0.676
Flexible: Social	0.816	26	0.422
Organized	-0.436	26	0.666
Proactive	-2.743	26	0.033*

\*p<.05

Table 4  
*Significant Differences Matrix of RQ.Age, Gender, Education, Teaching Exp, Admin. Exp.*

<b>Resilience Dimensions</b>	<b>Age</b>	<b>Gender</b>	<b>Education</b>	<b>Teaching.Exp.</b>	<b>Admin.Exp.</b>
Positive: The World	X		X	X	
Positive: Yourself					
Focused		X		X	X
Flexible: Thoughts		X		X	
Flexible: Social			X		
Organized					
Proactive	X				X

X indicates significant differences

## **Elementary and Special Education Pre-service Teachers' Understandings of Collaboration and Co-teaching**

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### **Abstract**

In the current education context (IDEIA, 2004; NCLB, 2003), many K-12 schools are using collaborative models such as co-teaching to address the needs of all learners, but pre-service teachers are often inadequately prepared for collaborative teaching in inclusive classrooms. This study explored 46 elementary and special education pre-service teachers' constructions of collaboration and co-teaching as they partnered for a combined classroom management course and a field experience. Analyses of student reflections suggest two overarching themes: developing understanding of the complexities of co-teaching and the role of field experiences in connecting theory to practice.

The contents of this manuscript were developed under a grant from the US Department of Education, Cooperative Agreement #H325TH325T070022. However, those contents do not necessarily represent the policy of the US Department of Education, and you should not assume endorsement by the Federal Government. Project Officer, Tina Diamond.

With federal legislation (IDEA, 2004; NCLB, 2003) requiring increased access to the general education curriculum for all students, children with disabilities are spending a larger portion of their day in general education settings. In fact, 79% of students with disabilities spend

40% or more of the school day in general education classrooms (National Center for Education Statistics, 2008). Part of the IDEA mandate includes incorporating Response to Intervention (RTI) as a framework for providing early intervention for all students experiencing academic and behavioral challenges in general education classrooms (Pierangelo & Giuliani, 2008). The confluence of these initiatives has led to an increased presence of students with widely varying academic and behavioral skills in K-12 general education classrooms (Pierangelo & Giuliani, 2008). This trend towards access to the general education curriculum for all students is occurring in the context of a high stakes, standards-based movement with increased focus on teacher accountability (Brownell, Sindelar, Kiely, & Danielson, 2010).

As implementation of these current reforms moves forward, the roles of general educators and special educators are being redefined, with an emphasis placed on increased collaboration to ensure positive outcomes for all learners in the general education setting (President's Commission on Excellence in Special Education 2002; Brownell, et al., 2010). Ultimately, general and special educators are now working more frequently in a shared space, the inclusive K-12 general education classroom. In this context, general education teachers must provide effective instruction for a wider range of learner needs in their classrooms, while special educators are spending more time delivering services (either direct instruction or through collaboration with general education) within general education classrooms and less time in self-contained environments (Mastropieri, Scruggs, Graetz, Norland, Gardizi, & McDuffie, 2005).

The move towards increased teacher collaboration in K-12 classrooms necessitates that colleges of education refocus on the preparation of both general and special education pre-service teachers who are able to work collaboratively upon entering the profession (Brownell, et al., 2010; Kamens, 2007; Shippen, Crites, Houchins, Ramsey, & Simon, 2005; Van Laarhoven,



Munk, Lynch, Bosma, & Rouse, 2006). The preparation of general and special education pre-service teachers is at a crossroads and moves toward collaborative teacher education are on the rise with many of these efforts resulting in dual endorsement programs (Pugach & Blanton, 2011). Pugach and Blanton note, “beyond the generally agreed-on belief that collaboration between general education and special education is a good direction in which to take teacher education, what is really going on in the name of these multiple collaborative pre-service education efforts does not appear to be well understood” (2011, p. 181).

The purpose of this study is to address recent calls to re-vision and understand collaborative teacher preparation for working with students with disabilities in the current educational context (Brownell, et al., 2010; Pugach & Blanton, 2011). In this paper, we describe the outcomes of a joint venture between faculty in a Department of Elementary Education and a Department of Special Education to foster collaboration among pre-service general and special education teachers. Specifically, we explore elementary and special education pre-service teachers’ developing constructions of collaboration and specifically co-teaching as they participated in a combined management course and linked field experience.

## **A Review of Collaboration and Co-Teaching**

### **Teacher Collaboration**

Collaboration is defined by Boudah, Schumaker, and Deshler (1997) as an “educational approach in which general and special educators work in a coactive and coordinated fashion to jointly reach academically and behaviorally heterogeneous groups of students in educationally integrated settings” (p. 18). This requires individuals who are willing to actively develop the necessary knowledge, skills, and attitudes that foster a collaborative partnership. Effective

collaboration allows participants to achieve common goals and is dependent on open communication, positive attitudes towards the collaborative relationship, and an assured perception that collaboration is a beneficial educational approach.

The need for collaboration is evident as The Study on Personnel Needs in Special Education (SPeNSE, 2001) found that 96% of general education teachers had previously or were currently teaching students with disabilities. Collaboration among general and special educators can be a critical factor in general education teachers' perceptions of their abilities to work with students with disabilities in inclusive classrooms. Although most felt successful, their sense of self-efficacy increased based on the level of support they received from and their relationship with special education teachers (SPeNSE, 2001). Similarly, Silverman (2003) asserted that in addition to teachers' beliefs in the abilities of students with disabilities and their teaching efficacy to work with these students, a conviction in the role of special educators as a vital collaborators in teaching all students was a third critical indicator in general education teachers' support for inclusion.

The nature of the collaboration between general and special educators is also shifting as a result of the increased role of RtI in K-12 schools and the varying interpretations of the role of special educators within RtI. Fuchs, Fuchs, and Stecker (2010) describe the current debate between those who support an RtI model in which the most intensive tiers include current special education programs and those who believe RtI should blur the lines of general and special education to the point that resource and self-contained classrooms are eliminated. Supporters of the latter envision K-12 settings in which special educators take up "residence in regular classrooms to co-teach with general educators; tutor small groups of at-risk children in classrooms, hallways, conference rooms, and libraries; and become members of problem solving

teams to develop individualized programs for the most difficult-to-teach, chronically unresponsive children (p. 306). ” To date, there is no clear picture of how collaboration between general educators and special educators will look in the context of RtI, and its enactment in K-12 settings varies greatly.

Efforts to prepare general and special education pre-service teachers for the changing nature of collaboration in K-12 settings are necessary. Pugach and Blanton (2011) describe current efforts in higher education as falling into one of three dominant practices: a growing number of programs leading to dual licensure, increased collaborative program development as a result of the Office of Special Education Programs (OSEP) 325T grants, or collaborative activities in pre-service preparation when there is not dual licensure in place. What is not known is how effective these practices are in preparing pre-service teachers for collaboration and inclusion.

### **Co-teaching as Collaboration**

One form of collaboration among general and special education teachers in inclusive K-12 settings is co-teaching (McKenzie, 2009). Co-teaching is when “...two or more professionals jointly deliver substantive instruction to a diverse, or blended, group of students in a single physical space” (Cook & Friend, 1995, p. 1). Weiss and Brigham (2000) found that tremendous variety exists in terms of how co-teaching was enacted in K-12 classrooms. This may be due, in part, to the range of co-teaching models used in K-12 classrooms including one teach/one assist, station teaching, parallel teaching, alternative teaching, and team teaching (Friend & Cook, 2009).

Research indicates that the preferred implementation of co-teaching is through models

that maximize the skill sets of both general and special educators (Scruggs, Mastropieri, & McDuffie, 2007). These models were identified as more effective than models such as one-teach/one assist, which if used inappropriately, cast the special educator in an assisting, subordinate role (Buckley, 2005; Rice & Zigmond, 2000; Dieker & Murawski, 2003; Scruggs et al., 2007). For example, special education teachers in one-teach/one assist models typically reported taking the lead in behavior management, monitoring, and observing while the general education teacher was largely responsible for instruction of content (Buckley, 2005; Rice & Zigmond, 2000; Weiss & Brigham, 2000; Yoder, 2000). This distinction inadvertently created discrepancies between the teachers' power levels and drew attention to the differences in students with and without disabilities (Scruggs et al., 2007). Yet, despite this knowledge, the one teach/one assist model remains the most prevalent form of co-teaching in inclusive classrooms (Scruggs et al., 2007).

Reports of general and special education teachers' experiences in co-teaching partnerships are highly contextualized and as such the research findings are mixed. General and special education teachers self-reported positive attitudes towards co-teaching, particularly as it related to their professional development (Austin, 2001; Fennick & Liddy, 2001; Scruggs, et al., 2007). Specifically, Austin (2001) found that general education teachers noted improved management and curriculum accommodation skills, while special education teachers noted increases in their content knowledge as a result of co-teaching experiences. In contrast, teachers readily identified a variety of pervasive school-based factors that made collaborative and co-teaching difficult. These include a lack of common planning time, personal and professional compatibility issues, lack of role clarity, issues with protection of turf, scheduling difficulties, and funding concerns (Dieker & Murawski, 2003; Fennick & Liddy, 2001; Kames, Loprete, &

Slostad, 2000; Rice & Zigmond, 2000; Weiss, 2004 Yoder, 2000). Research suggests teachers' experiences with co-teaching could be mediated by effective training, on-going professional development, and administrative support, but the presence of these components varied greatly across school contexts (Buckley, 2005; Rice & Zigmond, 2000; Yoder, 2000).

The literature indicates exposure to disabilities, opportunities to work with students with disabilities, and an emphasis on collaboration at the pre-service level may ameliorate in-service teacher anxieties and challenges towards inclusion and co-teaching (Giangreco, Edelman, & Dennis, 1991 as cited by Shade & Steward, 2001; Shippen, et al., 2005). Furthermore, field experiences, particularly those undertaken together with peers in general and special education, may have a profound and positive impact on pre-service teachers developing conceptions of co-teaching and inclusion (Austin, 2001, Van Laarhoven, et al., 2007). Yet Griffen and colleagues (2006) reported that exposure to collaboration at the pre-service level is quite limited with less than 50% of special education and less than 33% of general education majors experiencing course content related to collaboration in the teacher preparation coursework. This may be due in part to the fact that there is great heterogeneity in teacher preparation for work with students with disabilities (Goe, 2006). While there are individual efforts within teacher preparation programs for collaboration and co-teaching through a variety of methods including dual endorsement programs, most preparation for collaboration and co-teaching through dual endorsement programs, most efforts remains fragmented, and general education pre-service teachers report feeling unprepared for working with students with disabilities (Fennick & Liddy, 2001; Welch, 1996).

Given the likelihood general and special education teachers will at some point in their careers find themselves in a co-teaching partnership in K-12 settings, researchers assert a more

aggressive approach is needed for preparing general and special educators for collaboration (Arthaud, Aram, Breck, Doelling, & Bushrow, 2007; Pugach & Blanton, 2009; Shippen et.al., 2005; Snyder, 1999). Our research is in response to the need to purposefully prepare pre-service teachers for collaborative settings and study these outcomes (Brownell et al., 2010; Pugach & Blanton, 2011). In the sections that follow we describe our effort to prepare general and special education pre-service teachers for the co-teaching partnerships they are likely to enter upon induction into teaching and the subsequent outcomes of these experiences on their understandings of collaboration and co-teaching.

## **Method**

### **Context**

The context for this research is a large, urban university in a major metropolitan city in the southeast. Recognizing the importance of early exposure to inclusion and co-teaching for pre-service teachers, faculty in the Department of Special Education and the Department of Elementary Education at one college of education conceptualized a cross-departmental collaborative experience between pre-service teachers in their respective programs. A project team consisting of two faculty (one from each department) and two support graduate assistants (one from each department) formed to explore collaborative and co-teaching possibilities.

We designed the final project around two key features: our co-teaching of a joint classroom management course with a linked field experience from the respective programs at a common time, and the formation of co-teaching partnerships for the elementary and special education pre-service teachers. In an attempt to have curricular coherence within these two features, we met prior to the beginning of the semester to develop the syllabi for both the course and field experience. Pre-service teachers from the two majors were combined during

management course instruction into one classroom co-taught by the two lead faculty. We identified and used instructional methods and co-teaching structures (Friend & Cook, 2009) that demonstrated the use of collaborative practices which allowed us to scaffold pre-service teachers' experiences in co-teaching in a common learning space—the university setting.

Co-teaching partners (one special education and one elementary education pre-service teacher) were placed together for a field experience in inclusive elementary (K-5) classrooms. This provided general education students opportunities to work with students with disabilities. It also created a forum for acknowledging the expertise that each major brought to the field experience: elementary educators' knowledge of curricular and management techniques and special educators' knowledge of specific strategies and interventions. Finally, we purposefully embedded a field component linked with the management course to create opportunities for pre-service teachers' to co-construct theory-to-practice connections in terms of behavior management, instructional planning, inclusion, and co-teaching.

### **The Collaborative Project**

The co-teaching project began in Spring 2009. Our initial class meetings were a series of day-long introductory seminars. For the first two weeks these seminar meeting days mirrored the days that the pre-service teachers would spend in elementary classrooms for the remainder of the semester. The purpose of these initial seminars was to provide time for the two cohorts of pre-service teachers to get to know each other and the faculty via team-building and goal setting activities and to assess initial understandings of co-teaching and inclusion. During these seminars faculty introduced the project and the concept of co-teaching using research literature and video-based activities.

On Wednesday evenings all of the pre-service general and special education students came together for the 3-hour classroom management course co-taught by the two faculty members on the project team. Weekly course topics included classroom management, Positive Behavior Supports, instructional planning, differentiated instruction, co-teaching, Response to Intervention, and students with disabilities. The model of teaching most frequently used by the faculty was team teaching; however we also used station teaching, parallel teaching, and alternative teaching (Cook & Friend, 1995). On several occasions, we divided the class by major (elementary or special education) to address assignments or course objectives specific to the two distinct groups.

Pre-service teachers from both majors began their field experiences at local elementary schools during the third week of the semester. These elementary schools volunteered for participation in the co-teaching project; however this did not necessarily mean they were exemplars of collaboration. Rather, these schools expressed interest by responding to an invitation from the district to participate in the project. The district pre-selected these schools for several reasons, including the fact that they had a number of appropriately credentialed teachers able to serve as supervisors and there was some indication that co-teaching was being implemented with some success in these settings. It is important to note that due to programmatic differences, the special education majors were in the field experience two days a week (Monday and Tuesday) and the elementary education majors were in the field one day a week (Tuesdays).

The nature of the field placements varied greatly as a result of the availability of classrooms that were labeled inclusive at the participating elementary schools. Although the original intention was to place all co-teaching partnerships in elementary classrooms where they would interact for some portion of the school day, this did not come to fruition. As a result, some



pairs were in full-day inclusive settings where the special education and elementary education majors spent the entire school day together in one general education classroom. In other situations, the special education partner visited the elementary education major's classroom for a portion of the day—ranging from 30 minutes to several hours. Finally, a few of the co-teaching partners were in the same school, but not in the same classroom. The special education major was in a self-contained special education classroom and the elementary education major was in a general education classroom. This was due to a lack of credentialed special education teachers in one particular setting. As a result, these pairs did not interact in the same classroom at any point during the school day. All of the partnerships were randomly created based on the geographic preferences of the students for their field experience.

Regardless of the nature of their placement, all co-teaching pairs were initially required to make arrangements to plan and teach three lessons together. As the semester progressed, it became clear this was not feasible for several pairs, and both the special education and general education pre-service teachers were allowed to co-teach with their supervising teacher or another pre-service teacher in their program in lieu of the original expectation (authors, 2010). As such, they experienced 'co-teaching' in the field experience in a different sense than originally intended. Finally, all of the pre-service teachers attended three one-hour seminars spread throughout the semester to debrief their overall experiences.

### **Participants**

A total of 58 pre-service teachers, 33 elementary education majors and 25 special education majors, enrolled in the course and linked field experience. Of these 46 pre-service teachers (21 elementary education majors and 25 special education majors) consented to

participate in the study. These were typical-aged students and were representative of the demographics of pre-service teacher education students.

The elementary education majors were part of a large K-6 certification program that enrolls approximately 100 new students each semester. For most, this was their first semester in the program and their first field experience. However they did not follow a structured course sequence as they progressed through the program. The elementary education majors took courses at various paces (part-time/full-time) and multiple sections of each course were offered each semester. For this project they were all registered for a Level 1 (first) field experience and a classroom management course. These two were purposefully linked for this project.

In contrast, the special education majors progressed through their certification program as a single cohort that formed during the fall semester prior to the project's implementation in January. These special education students took all of their courses together and followed a structured course sequence. Upon graduation, the special education majors were eligible for certification to work with students who have mild and moderate disabilities in grades K-12. For this project, they were all registered for a linked course and field experience, their second, which required them to be in K-5 schools two consecutive days per week.

### **Data Collection**

The data presented in this paper are one facet of a larger study examining elementary and special education pre-service teachers' perceptions toward inclusion, co-teaching, and collaboration. For this particular aspect of the study, data included reflective statements collected across one semester in the co-teaching project previously described. As part of a regular course assignment, participants electronically submitted weekly reflective investigations describing their experiences with an assigned topic that intersected both the course and field experience.

Fifteen reflections were completed in all. No length minimums were established. Participants also posted two follow-up responses to their peers' reflective investigations each week. These follow-up responses were intended to extend the conversation about the assigned topic for the week. The reflective investigations prompted students to consider a variety of specific topics, including classroom context, management systems, standardized testing, and parent involvement. Two of these reflective investigation topics (Week 3 and Week 15) overtly directed students to discuss their experiences with and perceptions of co-teaching.

### **Data Analysis**

Analysis of the data consisted of thematic analysis as described by Fereday and Muir-Cochrane (2006). All of the reflective responses from the participants were included for analysis. Through an iterative process consisting of multiple readings, codes were identified. The reflections were first independently read and coded manually. We met to review the results of the first iterative process and reach consensus on any discrepancies. Codes were then categorized based on common elements. We employed several of the quality indicators identified by Brantlinger, Jimenez, Klingner, Pugach, and Richardson (2005) that increase credibility of qualitative research. Investigator triangulation was achieved as four researchers worked together to analyze the data. Our collaborative work allowed us to ensure inter-rater reliability through independent coding following by peer debriefings in order to reach consensus. Finally, the semester-long field experience and data collected over time provided opportunities to obtain substantive information allowing for the presentation of findings such that readers are able to determine the extent to which findings are applicable to their degree of transferability to their own setting (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005).

## **Results**

Data analyses suggest two broad categories emerged from the elementary and special education teacher reflections: 1) developing understanding of co-teaching as a complex construct and the 2) role of the field experience as essential in shaping their perceptions of co-teaching. The findings are reported using direct quotes from the reflective statements of pre-service teachers in both elementary and special education.

### **Developing Understandings of Co-Teaching as a Complex Construct**

One category emerging from the data was the sense that pre-service teachers were grappling with a developing understanding of the complexities of co-teaching as a result of their experiences as students in a college classroom, as observers in a field placement, and as teachers in a K-5 classroom. This category included the codes initial conceptions, varied models, parity, lack of parity, perceived benefits, and potential hurdles. Of particular importance in their developing understandings was the wide array of co-teaching partnerships they were observing and experiencing. The vast majority of partners described their supervising teachers as relying heavily on the one teach (general education) and one assist (special education) model. The second most frequently described model was parallel teaching with the general education teacher working with the larger group and the special education teacher working with a small group of students with disabilities at a table in the same classroom.

**Initial conceptions.** Reflections indicate that many of the pre-service teachers from both majors had limited, if any understanding of co-teaching at the beginning of the project. For example, pre-service teachers from both majors expressed uncertainty or described misconceptions regarding the practice of co-teaching. They used words such as “apprehensive,” “a bit unsure,” “never heard of it,” and “anxious” to describe their initial feelings about co-

teaching. One elementary education major stated, “I am very skeptical to have someone always near me or observing me when I teach.” A special education major noted concerns that “co-teaching might take away from the teacher having the main control and power.” The initial reflections also revealed the pre-service teachers’ misconceptions regarding co-teaching. Several elementary majors noted that they thought the role of special educators was solely pulling “only children that needed special help” from the general education setting for resource time. Similarly, a special education major wrote, “I was unaware that general education teachers and special educators collaborated in a classroom together...I was unaware that I could end up a “floater” or “co-teacher”. Interestingly, while the elementary education teachers described what they thought the role of special educators was in K-5 classrooms none of the special education majors stated the anticipated role of elementary educators in co-teaching.

Both general and special education pre-service teachers entered the project with the understanding of the teacher as a solitary figure working in isolation in her own classroom. Their initial reflections reveal their grappling with the assimilation of a new construct, co-teaching, into their existing understanding of what it meant to be a ‘teacher.’ In addition, the field experience provided a valuable ‘real world’ setting for the pre-service teachers to further consider what co-teaching looked like in practice. This suggests that participation in a structured co-teaching experience at the very least raised awareness about the construct.

**Parity.** The pre-service teachers’ developing perceptions of effective co-teaching was also a result of the varying degrees of collaboration they observed in K-5 classrooms. Teacher parity, the equality of classroom roles and the supportive relationship exhibited in their interactions, was visible to the pre-service teachers in the way supervising teachers demonstrated

joint ownership of the classroom, students, and the overall planning. An elementary major, describing an example of teacher parity, wrote:

When I first got in my classroom, I didn't even know which teacher was the Elementary teacher and which was the Special Education teacher. I had to ask. The students acknowledge them both as teachers, and they both work equally as much with the students.

The reflective statements were replete with examples of parity. One pre-service teacher in illustrating support stated, "These two teachers tag team the students on discipline and behavior to make all students accountable for their behaviors. When one teacher is unsure about something she consults the other for her input on what to do or vice versa." Several participants described how supervising teachers modeled the sharing of space, students and tasks. For example one pre-service teacher wrote, "Both teachers in this room share the instruction and plan lessons together, it is very cohesive." Another noted, "Also throughout the day especially during the reading the teachers each have a small group that they work with and the groups constantly rotate so that a teacher meets with all of them."

For pre-service teachers from both majors, parity was described via examples of positive communication skills, agreement of tasks, collaborative planning and acknowledgement of each other within the context of the classroom. Their reflections revealed they were able to see parity when manifested in ideal partnerships on a co-teaching continuum; however, they did not readily recognize parity in settings that were less than perfect.

**Lack of parity.** On the other end of the spectrum, a number of pre-service teachers described dysfunctional co-teaching partnerships with inequality in teacher roles (i.e., general education versus special education supervising teachers). This lack of parity was reflected in pre-

service teachers' comments indicating that their supervising teachers engaged in tasks in a separate fashion, unaware of each other, which often resulted in power differentials within the classroom. One pre-service teacher summarized lack of parity when she indicated, "I don't really see much co-teaching taking place in my 4<sup>th</sup> grade classroom with Mr. X. Miss Y is the ESE professional that comes in to work with some of the students but it's more of a one-on-one basis." Another described her experience as follows:

My only experience with co-teaching thus far in my internship has been a loose rendition of the one teach/one assist model. Mrs. Z (general education) teaches the majority of the subjects...Mrs. C (special education) comes in every other day or so to make sure the fuse is successful...To me, co-teaching implies shared effort, shared responsibility, shared goals. I feel like sitting at one's desk, grading papers while Mrs. C teaches a lesson is like cheating—it cheats the students.

In addition to separation of tasks, lack of parity also included power differentials, preparation and planning time, tension and contextual factors. For example one pre-service teacher, when describing the relationship between the two supervising teachers, related, "She usually comes in about three or four times during the day and works with her students. I don't think that the two teachers have the best relationship." Several pre-service teachers described difficulties in how special education teachers were scheduled to provide services as contributing to the lack of parity. One noted, "The ESE teacher hops back and forth from our room to the other 4<sup>th</sup> grade room next door." Yet another stated, "It is so confusing with the ESE teacher [going] back and forth [from classroom to classroom]."

Both elementary education and special education pre-service teachers described scenarios in which the in-service co-teachers teachers functioned separately and/or at varying levels of

perceived power in the classroom. Their reflective statements varied as to what they felt attributed to the lack of parity. In some instances they noted the existing school structures such as case load and administrative demands, while in others incompatibility of the partnerships and comfort levels of the co-teaching partners were to blame. The real-world context of the course and field experience allowed pre-service teachers to observe and identify instances in which co-teaching partnerships were not ideal.

**Perceived benefits.** During their experiences with co-teaching as students, observers, and teachers, the pre-service teachers from both majors noted student benefits in terms of academic, behavioral, and social skills. One participant illustrated student benefits by stating, “There is more opportunity for small group work and more intimate instruction.” Another described co-teaching as a method that “enhances students learning because they have two different teachers with different perspectives, strategies, and outlooks.” One pre-service teacher described one exemplary model of effective co-teaching explaining how the teachers in her room structured instruction so that each assumed responsibility for all students learning. She expressed:

The students do not see the difference between the ESE students and the non-ESE students because the groups get switched up depending on subject and the ESE teacher does not just work with the ESE students for individual work.

Pre-service teachers from both majors included the benefits of co-teaching for the teachers. Typical comments included “the idea of strength in numbers,” “two minds are better than one,” and “like parenting—you have two sets of eyes.” Indicative of these, one elementary education major noted, “You have a second person to support you in decisions, bounce ideas off of and help develop things you may not have been able to do on your own.” The pre-service teachers also noted that co-teaching appeared to increase the variety of instructional approaches.



An elementary education major stated, “You feed off of each other’s ideas and concepts before, during and after a lesson.” Similarly, a special education major wrote, “Students will benefit from having two teachers in the classroom, each with different skills and areas of expertise.”

Part of pre-service teachers developing understandings of co-teaching was recognizing the potential benefits of collaboration with a colleague. They identified these benefits in terms of both the students and their professional development. This included a recognition that they could capitalize on the area of expertise that each individual teacher brought to the partnership. The course and field experience provided a real world opportunity for the pre-service teachers to observe and experience these benefits.

**Potential hurdles.** While the pre-service teachers’ reflections indicated largely positive perceptions of and experiences with co-teaching, the elementary and special education pre-service teachers also recognized concerns about co-teaching. With the exception of three pairs who were in full-day inclusion models, a primary concern was the quantity of time special educators spent in particular elementary classroom. An elementary major stated, “I think it would be best if there were two co-teachers in the room all day.” Another wrote, “The little time ESE teachers spend in one particular classroom...can make it difficult to establish quality co-teaching partnerships. Continuity and consistency are important.” Similarly, a special education major noted, “I think it is harder to grasp all of the concepts of co-teaching when you are only in each classroom for 30 minutes.” Another suggested, “ESE teachers should not have to be spread so thinly. It doesn’t make sense that they are supposed to co-teach with three different general education teachers.”

The pre-service teachers from both groups also identified the importance of fit and compatibility as critical elements in effective co-teaching experiences for both their partnerships

as well as those of their supervising teachers. One elementary education major observed, “I have heard it (co-teaching) is really a catastrophe when the teachers don’t get along.” In fact, many suggested that it was the most important component of successful co-teaching partnerships. An elementary education major stated, “My two supervising teachers worked so well together and had such great chemistry.” Another wrote, “My co-teaching partner and I got along extremely well, and I can’t imagine a better person with whom I could have shared this experience.” Another wrote, “Working together with her became such an asset. We would play off each other with ease and gain such positive responses with the students that came so naturally.” Finally, an elementary education major stated “you really need to have a partner that you get along with, someone who will support you, finish your thoughts if you are forgetting something, help you along the way...” A special education major noted that differences are not always problematic, “We have different teaching styles and different teaching backgrounds, but were able to use our differences to create a positive learning environment.” In many instances, the pre-service teachers described feeling “lucky” to have found a partner with whom they were compatible. Regardless, the pre-service teachers perceived compatibility as essential to a successful co-teaching partnership.

### **The Role of ‘Real World’ Experiences**

A second category emerging from the data was the field as a vital context for pre-service teacher learning. This category included the codes theory-to-practice connections, developing understandings of special education, and opportunities for reciprocal learning.

**Theory-to-practice.** Regardless of major, the field component represented a real world context for the pre-service teachers to experiment with and apply what they learned at the university about co-teaching. In fact, they explicitly described the value of observing and

applying learning in a field-based setting, with many noting the connections and disconnects between university classroom learning and their field experiences. An elementary major stated, “There is so much that you can learn from actually being in the classroom and being able to do stuff rather than just observing behaviors.” Another wrote, “I really feel like I learned so much through this internship that I definitely would not have gotten out of a class.” A special education teacher summarized her experiences, “I was able to learn more in this semester spent in the classroom than I could have ever learned sitting in a lecture. I enjoyed the support that our class gave to our practicum setting, and found myself often times using what we learned [in the university classroom] in my classroom.”

The variability of their field experiences and partnership structures appeared to impact the pre-service teachers’ overall depth of understandings of co-teaching and the extent to which pre-service teachers embraced co-teaching. The enthusiasm was clearly strongest in the co-teaching pairs who were placed in classrooms where they were co-teaching for the majority, if not all, of the school day. One participant in such a partnership described the impact of her experience on her attitude towards collaboration:

I really like the experiences of co-teaching. I wasn’t so sure about the concept at first but [I] am warming up to it. There is more opportunity for small group work and more intimate instruction. Both teachers in this room share instruction time and plan lessons together, it is very cohesive...from these experiences I have become a large supporter of co-teaching.

The experiences of participants who were placed in inclusive classrooms with less intensive and/or poorly functioning co-teaching environments exhibited attitudes ranging from tempered enthusiasm to disappointment. In many, they wrote as to how they hoped co-teaching to be more than what they observed. One pre-service teacher remarked,

When I first learned about co-teaching I wasn't very excited about it. Being in the classroom and seeing it in action has changed my mind a bit, I'm still not completely sold on the idea. From what I've seen, it serves more as a convenience than anything else.

Another admitted,

I want to believe in co-teaching but I haven't seen an example of it that has inspired me or made me think very highly of it. I spoke with my mentor teachers about their feeling about and experience with co-teaching, as well as how it has gone at their school and I was really disappointed with what I heard.

The nature of the collaboration and co-teaching occurring in the field experience setting was in shaping the pre-service teachers' attitudes and understandings. Pre-service teachers from both majors felt most strongly about co-teaching when it was enacted in a way that allowed time for highly compatible teachers to work together in a single classroom.

**Supporting understandings of special education.** The field experience also provided a context for pre-service teachers from both majors to acquire and practice the 'language' of special education. For example in our first course meeting, the issue of 'person-first' rather than 'disability-first' language emerged after one of the elementary education majors unknowingly used the phrase 'autistic child.' The ensuing conversation revealed the importance of recognizing the person first, rather than the disability, and represented an important first milestone in the collaboration between the general and special education pre-service teachers. This lesson carried over into their reflections on the field experience. In fact, in their course reflections, each of the elementary education majors wrote in person first language as did the special education majors.

Additionally, the elementary and special education majors adeptly used terms associated with special education (IEP, 504 plan, accommodations, modifications) in their reflections on the

field experience as they progressed through the semester. The pre-service teachers from both majors reflected with frequency during the field experiences on the importance of recognizing the ‘uniqueness’ of all learners—a concept emphasized throughout the university course. As one elementary education major noted, “I have learned that every child is different. What works for the majority of the children in the classroom does not work for ALL the children. In noticing this, it is necessary to make accommodations in all areas of a child's education.” Similarly, a special education major wrote, “Regardless of the acronyms used to describe a child, that child still has the ability to learn, and it is our job as teachers to do our best no matter what.” The pre-service teachers were also able to recognize and reflect on specific accommodations they observed in the field experience. One pre-service teacher noted, “The accommodations (in my classroom) include help with organizational strategies, small group direction and work, visual and verbal cues, direct instruction, more time completing assignments, more instructional time, manipulative use, pacing adjustments, proximity control, reminders of rules, and prompting.”

The field provided an authentic context for pre-service teachers from both majors to acquire and practice professional language. For elementary majors, this included use of special education language in a real world setting. Simultaneously, special education majors were applying their specialized knowledge in the context of the general education classroom.

**Reciprocal learning.** The field experiences provided a context for a developing notion of reciprocal learning among both elementary and special education pre-service teachers. One elementary pre-service teacher reflected, “we all came to the table with different experiences, opinions, and plethora of information, and we were able to work together collaboratively...” Similarly, another elementary major reflected about her co-teaching partner, “We collaborated on all of our lessons and I learned a lot from her [special education partner]; she was always

willing to teach me new things.” A special education pre-service teacher wrote, “I enjoyed having an elementary counterpart to work with and I benefitted from working with him as well.”

In other words, an important realization for many of the participants was that their counterparts in inclusive classrooms have an expertise to share. The field experience provided a context for experiencing reciprocal learning across majors, which is also a critical component of co-teaching partnerships.

### **Conclusion**

This study highlights the outcomes of our efforts to design collaborative activities for pre-service teachers in order to better prepare them for future partnership in K-12 classrooms. Elementary and special education pre-service teachers’ reflections indicated developing understandings of the complexities of co-teaching as a result of their experience in this project. They applied course learning to field settings, recognized co-teaching structures, identified positive outcomes, and voiced concerns about potential hurdles. These findings support the existing literature that suggests exposure to co-teaching and inclusion prior to induction may positively shape pre-service teachers’ developing conceptions (Giangreco, Edelman, & Dennis, 1991 as cited by Shade, Steward, 2001; Shippen, et al., 2005). The power of the field experience and the paired general and special education pre-service partnerships also appeared to inform their learning regarding co-teaching. The pre-service teachers in this study recognized the field experience as vital for making connections to course constructs including co-teaching, special education language and reciprocal learning. Their reflections lend voice to the research literature indicating the vital role of contextual field experience learning for strengthening pre-service teachers’ understandings of co-teaching (Austin, 2001; Van Laarhoven, et al., 2007).

The results of this study yield several findings that advance the literature on co-teaching

and as such, warrant further interrogation. First, issues of parity or lack of parity seemed to be of utmost importance. This is not surprising considering most, if not all, initially viewed teaching as a solitary endeavor – one teacher in one classroom. Faced with having to share their classroom in this collaborative field experience, many questioned the possibility of losing their autonomy as *the* teacher. In many instances, the pre-service teachers identified ‘successful’ partnerships as those in which the two teachers worked simultaneously ‘co-teaching’ all students. In contrast, they characterized models such as one-teach/one-assist and consultation as inferior enactments of co-teaching. This left us to ponder to what extent did we predispose the pre-service to view these models as dichotomous. Did our weekly modeling of co-teaching hinder the students from seeing or valuing other models? Did it subtly give them permission to value only one form of collaboration? As teacher educator explore collaborative activities as a mechanism for preparing pre-service teachers for K-12 classrooms, a heightened awareness of the subtle messages we are sending about collaboration is essential. From our results, we suggest that perhaps we needed to do more to scaffold the pre-service teachers’ understandings of all models of co-teaching and recognize why certain models may or may not be appropriate in K-5 classrooms at any given time. We needed to be more overt in our connections to what was happening in their field experiences. In fact the differences the pre-service teachers were observing exemplify the realities of how co-teaching is implemented in diverse ways in schools. By asking the pre-service teachers to critically examine issues of planning, scheduling, and implementation of a wide array of co-teaching models we would have developed a richer understanding of co-teaching.

Our results also highlight the critical importance of a quality field placement on pre-service teachers’ professional development. Again, as teacher educators explore collaborative

activities in preparing elementary and special education teachers, connecting the university work to the field is essential. If we are truly trying to transform pre-service teacher learning, the nature and quality of the field experience matters (Kamens, Loprete, & Slostad, 2000). The context in which new teachers find themselves is also instrumental in the likelihood they will implement what they have learned (Kamens et al., 2000). As teacher educators we have less control of these contextual factors that may impede the extent to which neophyte teachers, either general education or special education, engage in collaboration or welcome students with disabilities in their classrooms. Teacher educators must be aware of contextual factors (e.g. lack of parity, lack of common planning time, scheduling difficulties, etc) that may support stereotypical views of the role of special educator and the relationships between general education and special education thus reaffirming existing negative attitudes towards collaboration. Explicit instruction on how to problem solve situations that may result in lack of parity is necessary at the pre-service level. Also as part of instruction pre-service teachers must understand that a positive effective collaborative relationship is not accidental but rather consciously constructed. In this regard skills that contribute to the development of positive relationships with others (e.g. communication, reflection, self-awareness, etc.) must be developed and practiced.

There are several limitations in this study. The pre-service teachers were working within our framework for co-teaching and within our desired structures for how it was to be enacted. Further they were responding to their perceptions of co-teaching in written reflections that they knew would be read by us, the course instructors. To what extent were the students writing based on what they thought that we wanted to hear? Also, given the frequency of reflecting required and the lack of specific guidelines for the reflections, the pre-service teachers' reflections became increasingly brief over time. We are left to wonder if there was more the students wanted



to (or could have) said about their experiences, but failed to do so. The limited data sources and the lack of more in-depth reflective assignments are a weakness that should be addressed in future research.

Despite the limitations, this study may resonate with teacher educators as it provides an example of how they might design collaborative activities to prepare pre-service teachers co-teaching. Furthermore, incorporation of collaborative activities is one of the three main approaches used currently in teacher education to prepare pre-service teachers for future collaboration (Pugach & Blanton, 2011). As a result understanding the impact of such experiences on pre-service teachers' understanding of co-teaching and collaboration is vital in furthering the field. The outcomes of this study may inform teacher educators as they consider designing similar experiences for their pre-service teachers. Because inclusion is an increasingly common practice in K-12 classrooms (U. S. Department of Education, 2008), teacher educators have an obligation to both model co-teaching and prepare general and special education teachers for the collaborative experiences they may have as in-service teachers in K-12 classrooms.

## References

- Arthaud, T. J., Aram, R. J., Breck, S. E., Doelling, J. E. & Bushrow, K. M. (2007). Developing collaboration skills in ore-service teachers: A partnership between general and special education. *Teacher Education and Special Education*, 30(1), 1-12.
- Austin, V.L. (2001). Teachers' beliefs about co-teaching. *Remedial and Special Education*, 22, 245-255.
- Boudah, D. J., Schumacher, J. B., & Deshler, D. D. (1997). Collaborative instruction: Is it an effective option for inclusion in secondary classrooms? *Learning Disability Quarterly*, 20, 293-316.
- Brantlinger, E., Jimenez, R., Klingner, J., Pugach, M., & Richardson, V. (2005). Qualitative studies in special education. *Exceptional Children*, 71(2), 195-207.
- Brownell, M. T., Sindelar, P.T., Kiely, M.T., Danielson, L.Cl, (2010). Special education teacher quality and preparation: Exposing foundations, constructing a new model. *Exceptional Children*, 77(3), 357-377.
- Buckley, C. (2005). Establishing and maintaining collaborative relationships between regular and special education teachers in middle school social studies inclusive classrooms. In T.E. Scruggs & M.A. Mastropieri (Eds.), *Cognition and learning in diverse settings: Vol 18. Advances in learning and behavioral disabilities* (pp. 153-198). Oxford, UK: Elsevier.
- Cook, L. & Friend, M. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children*, 28(3), 1-16.
- Dieker, L.A., & Murawski, W.M. (2003). Co-teaching at the secondary level: Unique issues, current trends, and suggestions for success. *The High School Journal*, 86(4), 1-13.

- Fennick, E. & Liddy, D. (2001). Responsibilities and preparation for collaborative teaching: Co-teachers' perspectives. *Teacher Education and Special Education*, 24(3), 229-240.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), Article 7. Retrieved March 20, 2010 from [http://www.ualberta.ca/~iiqm/backissues/5\\_1/html/fereday.htm](http://www.ualberta.ca/~iiqm/backissues/5_1/html/fereday.htm)
- Friend, M. & Cook, L. (2009). *Interactions: Collaboration skills for school professional* (6<sup>th</sup> ed.). New York: Longman.
- Giangreco, M.F., Edelman, S., & Dennis, R. (1991). Common professional practices that interfere with integrated delivery of related services. *Remedial and Special Education*, 12(2), 16-24.
- Goe, L. (2006). *The teacher preparation, teacher practices, student outcomes relationship in special education: Missing links and next steps. A research synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality. *Individuals with Disabilities Education Act [IDEA]*. (2004). Washington, D.C.
- Kamens, M.W. (2007). Learning about co-teaching: A collaborative student teaching experience for preservice teachers. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, 30, 155- 166.

- Kamens, M. ., Loprete, S. J. & Slostad, F. A. (2000). Classroom teachers' perceptions about inclusion and preservice teacher education. *Teaching Education*, 11 (2), 147-158.
- McKenzie, R.G. (2009). A national survey of pre-service preparation for collaboration. *Teacher Education and Special Education*, 32(4), 370-393.
- National Center for Education Statistics. (2007). Digest of Education Statistics, Table 48.
- Retrieved July 7, 2009 from [http://nces.ed.gov/programs/digest/d07/tables/dt07\\_048.asp](http://nces.ed.gov/programs/digest/d07/tables/dt07_048.asp)
- No Child Left Behind (NCLB) Act of 2001, 20 U.S.C.A. § 6301 *et seq.* (West 2003).
- Pierangelo, R., & Giuliani, G. A. (2008). *Frequently asked questions about Response to Intervention: A step-by-step guide for educators*. Thousand Oaks, CA: Corwin Press, Inc.
- Pugach, M.C. & Blanton, L.P. (2011). Interrogating the meaning of collaboration and its role in teacher education. *Teacher Education and Special Education: The Journal of the Council for Exceptional Children*, 34(3), 181-182.
- Pugach, M.C., Blanton, L.P., & Correa, V.I. (2011). A historical perspective on the role of collaboration in teacher education reform: Making good on the promise of teaching all students. *Teacher Education and Special Education: The Journal of the Council for Exceptional Children*, 34(3), 183-200.
- Pugach, M. C., & Blanton, L. P. (2009). A framework for conducting research on collaborative teacher education. *Teaching and Teacher Education*, 25, 575-582.
- President's Commission on Excellence in Special Education. (2002). *A new era. Revitalizing special education for children and their families*. Retrieved July 2, 2009 from <http://www.ed.gov/inits/commissionsboards/whspecialeducation/reports/pcesefinalreport.pdf>
- Rice, D. & Zigmond, N. (2000). Co-teaching in secondary school: Teacher reports of

developments in Australian and American classrooms. *Learning Disabilities Research and Practice*, 15, 190-197.

Scruggs, T.E., Mastropieri, M.A., & McDuffie, K.A. (2007). Co-teaching in inclusive classrooms: A metasynthesis of qualitative research. *Exceptional Children*, 73(4), 392-416.

Shade, R. A., & Steward, R. (2001). General education and Special education pre-service Teachers' Attitudes Toward Inclusion. *Preventing School Failure*, 46(1), 37-45.

Shippen, M., Crites, S., Houchins, D., Ramsey, M., Simon, M. (2005). Preservice Teachers' Perceptions of including Students with Disabilities. *Teacher Education and Special Education*, 28(2), 92-9.

Silverman, J.C. (2007). Epistemological beliefs and attitudes toward inclusion in pre-service teachers. *Teacher Education and Special Education*, 30(1), 42-51.

Snyder, R. F. (1999). Inclusion: A qualitative study of inservice general education teachers' attitudes and concerns. *Education*, 120 (1), 173-180.

Study of Personnel Needs in Special Education. (2001). General education teachers' role in special education. *SPeNSE Fact Sheet*, retrieved June 1, 2009 from <http://ferdig.coe.ufl.edu/spense/gened11-29.pdf>

U. S. Department of Education, National Center for Education Statistics. (2008). Digest of Education Statistics [http://nces.ed.gov/programs/digest/d07/tables/dt07\\_048.asp](http://nces.ed.gov/programs/digest/d07/tables/dt07_048.asp)

Van Laarhoven, T., Munk, D., Lynch, K., Bosma, J., & Rouse, J. (2007). A Model for Preparing Special and General Education Preservice Teachers for Inclusive Education. *Journal of Teacher Education*, 58(5), 440-55. Retrieved 9 July 2009, from Education Full Text database.

Weiss, M.P. (2004). Co-teaching as science in the schoolhouse: More questions than answers.

*Journal of Learning Disabilities*, 37, 218-223.

Weiss, M.P. & Brigham, F.J. (2000.) Co-teaching and the model of shared responsibility: What does the research support? In T.E. Scruggs & M.A. Mastropieri (Eds.), *Advances in learning and behavioral disabilities: Vol 14. Educational interventions* (pp. 217-245). Oxford, UK: Elsevier.

Welch, M., (1996). Teacher education and the neglected diversity: Preparing educators to teach students with disabilities. *Journal of Teacher Education*, 47, 355-366.

Yoder, D.I. (2000). Teachers; perceptions of elements and competencies/characteristics that affect collaborative teaching at the secondary level. *Dissertation Abstracts International*, 61(12), 4735A (UMI No. AAI9996182).

The contents of this manuscript were developed under a grant from the US Department of Education, Cooperative Agreement #H325TH325T070022. However, those contents do not necessarily represent the policy of the US Department of Education, and you should not assume endorsement by the Federal Government. Project Officer, Tina Diamond

Self-Regulated Strategies Chinese Graduate Students Employ to Learn English at Three  
American Universities

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Abstract

International students in the United States often employ culture-specific learning strategies to help them improve their proficiency in English. This study explored the use of self-regulated strategies by 49 Chinese graduate students from 24 fields of study at three universities in the Northeast. The research used the mixed survey method to generate both quantitative and qualitative data. The findings reveal what strategies are commonly used by the participants, whether there is any difference in strategy choice between male and female students, whether there is any difference in strategy choice between doctoral and Master's students, as well as how these advanced students perceive and articulate their experiences to learn English in a U.S. context. The results may have both theoretical and practical implications, especially for their American professors, other Chinese graduate students, and English language education in China.

According to the *Open Doors* report, in the 2009-2010 academic year, there were as many as 127,628 students (the majority of whom were graduate students) from China studying at various universities in the United States, making up 18.5% of the total

international student population (Institute of International Education, 2010). Given that Chinese culture, language and education are distinctly different from those in the United States, it is no small undertaking to pursue rigorous graduate-level study, using a working language that is not their native tongue. Therefore, it is imperative for the Chinese graduate students and their American professors, as well as those concerned with the conditions of this significant cohort of non-native learners, to better understand how they self-initiate learning strategies to sharpen their English skills so that they may read the textbooks, write academic papers, speak in class discussions or presentations, and listen to and interact with other native-born peers.

This study used a mixed survey method to explore the learning strategies a diverse group of Chinese graduate students use to study English at three American universities. Specifically, the study addressed these four research questions: 1. What are the common learning strategies implemented by these Chinese graduate students? 2. How do the male and the female students compare in their strategy choice? 3. How do the doctoral students and the master's students compare in their strategy choice? 4. How do they articulate their experience learning English as a unique cohort of international students in the United States?

### **Theoretical Framework**

This study is informed by research on Chinese students studying at various American universities, and research on self-regulated learning strategies.

### **Research on Chinese Students in the United States**

Comparative educational studies suggest that education in China and in the United States follows different theoretical orientations and instructional practices. According to



Stevenson and Stigler (2006), the classroom practices in the United States tend to emphasize the learner's personal abilities, interests and needs, and the Chinese practices stress more teacher-directed, textbook-based and test-oriented learning activities, memorization of foundational knowledge, reflective listening and thinking, and strong discipline and work ethic. Watkins and Biggs (1996; 2001) referred to the latter as Confucian-heritage learning culture.

China's national college entrance examination (*Gaokao*) system has also affected its current educational thinking and practices. Because of the system, instead of learner-centered teaching and learning activities, tests are built into the classroom instruction of every core curricular area and they may unduly influence many aspects of instruction (Ma, 2010; Zhao, 2009). As a result, students who reach college and graduate levels have passed a multitude of tests. Those coming to study at various American universities are no exception to such test-oriented learning experience, and they often intuitively know how to strategize to get good grades at school. Still, as international students in the United States, they inevitably face many obstacles studying in a foreign setting. In particular, they need not only to switch from Chinese to thinking, learning and interacting in English, but also to adapt some of their culturally shaped beliefs and practices to the new environment, which may create further challenges as they make the transition from a more teacher-directed, content-based approach to a more student-centered, participatory approach more prevalent in an American educational context.

Previous research on Chinese college and graduate students in the United States has explored their unique learning experience, academic discourse, and acculturation issues. For example, as early as sixty years ago, Wong (1950) self-examined her learning

experience at an all-girl college in California. Coming from a Chinese background and accustomed to learning through listening to lectures and taking notes, Wong remained a spectator in class discussions just “watching and listening with wonder to catch every movement and sound of these Caucasian girls who participated so easily in the college scene, who absorbed and contributed” (p. 166). Paradoxically, while at a disadvantage as a non-native speaker of English, Wong managed to cope with the academic challenges through hard work and careful listening, and in the end it was her paper that was selected as exemplary work and presented at an English conference.

More recently, Wu and Rubin (2000) compared the impact of Confucian orientation and American orientation on argumentative writing by 80 Chinese and American undergraduates. They found that the Chinese students’ command of English clearly affected their level of assertiveness in writing, and their writing was “characterized by relative indirectness, by expressions of Confucian principles of humaneness and collective virtue, and by a greater reliance on proverbs and other canonical expressions. American students, in contrast, included more self-disclosure through the medium of personal anecdotes” (p. 165). Furthermore, Prior’s (1998) series of case studies showed how Chinese and other graduate students engaged in what he called *disciplinary enculturation* through writing academic papers and interacting with their peers and professors.

### **Research on Self-Regulated Learning Strategies**

Studies of language learning process and strategy use were not new with elementary school students (e.g., Abraham & Vann, 1987; Chamot & El-Dinary, 1999; Wang, Quach, & Rolston, 2009). High-achieving elementary school students used a greater proportion of meta-cognitive strategies whereas low-achieving elementary school students

used a greater proportion of cognitive strategies (Chamot & El-Dinary, 1999). For example, low achieving students relied extensively on decoding of words (also known as bottom-up processing) but high achieving students used background knowledge (also known as top-down processing) to understand in reading. These results were echoed in studies of college students (Holschuh & Aultman, 2008; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Instruments to measure language learning strategies (e.g., Strategy Inventory for Language Learning) and cross-cultural comparisons were also conducted (Oxford, 1990; Oxford & Burry-Stock, 1995; Oxford, 2011). However, very few studies were targeted toward more advanced international students in the U.S. classrooms.

Building on the work of Bandura (1986) and others, Zimmerman and Martinez-Pons (1986) developed 14 categories of self-regulated learning (SRL) strategies using data collected from middle school students. These classes include: self-evaluation, organizing and transforming, goal setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequences, rehearsing and memorizing, seeking peer assistance, seeking teacher assistance, seeking adult assistance, reviewing tests, reviewing notes, and reviewing texts. Pape and Wang (2003) then merged the subcategories of seeking social assistance (i.e., from peers, teachers, and adults) and the subcategories of reviewing records (i.e., from tests, notes, and texts). Environmental structuring was split into physical environmental structuring and attention control. These changes resulted in a more parsimonious 11 category scheme. Schunk and Zimmerman (1997) argue that the development of self-regulation is dependent upon social, environmental, and behavioral triadic influences and that there are four levels of development: observation, imitation, self-control, and self-regulation. From a sociocultural

perspective, self-regulation is understood as a person's ability to plan, guide, and monitor his or her behavior from within and flexibly according to changing circumstances (Diaz, Neal, & Amaya-Williams, 1990). Self-regulated learners actively participate in their own learning (Griffiths, 2008), set goals for themselves and assess their process to achieve the goals (Wang et al., 2009), choose appropriate strategies through evaluating the setting, purposes, and learning styles (Cohen & Macaro, 2007; Ehrman, Leaver, & Oxford, 2003), and self-consciously regulate their cognitive, affective, and sociocultural interactive strategies in order to achieve the goals (Oxford, 2011).

In particular, Oxford (2011) included SRL strategies in her strategic self-regulation (S<sup>2</sup>R) model and identified nine uniqueness of her model: (a) integration of psychological, sociocognitive, and sociocultural theories; (b) a balance of cognition, meta-cognition, emotion, attitudes, motivation, sociocultural relationship, personal interactions, and power dynamics; (c) meta-strategies which includes not only meta-cognitive but also meta-affective and meta-sociocultural interactive strategies; (d) meta-strategies can be used at either the task or the whole-process level; (e) underscores the importance of deep processing strategies; (f) strategies can be used in ordinary learning situations as well as severe or crisis-like learning problems; (g) it is parsimonious with only 19 strategies and meta-strategies; (h) pays attention to the neurological elements and the cognitive demand of second language learning; and (i) embraces valuable techniques for assessing second language learning strategies and assisting learners in expanding their strategy repertoire.

Following Oxford's (2011) S<sup>2</sup>R model, this study examined what language-learning strategies Chinese graduate students choose to use on their own, and how they work to implement SRL strategies to improve their English skills in order to cope with their

disciplinary programs of study. As studies on language learning strategies called for the inclusion of gender (Bremner, 1999; Dreyer & Oxford, 1996; Foong & Goh, 1997; Green & Oxford, 1995; Nisbet, Tindall, & Arroyo, 2005) and gender differences were found in a few studies (Kissau, Quach, & Wang, 2009; 2010), we also included gender as an independent variable. As doctoral students are more developed in meta-cognition and are more experienced in social interaction and psychological affective strategies, we were also interested if their use of SRL strategies differs.

### **Methods**

This research used the mixed survey design with which both qualitative and quantitative data were collected at the same time (Creswell, 2008). The participants were selected using the volunteer sampling method (Gall, Gall, & Borg, 2010). Eighty graduate students from Chinese backgrounds were randomly selected from thirty disciplinary fields at three research universities, which are located in one medium-sized city and one small city in the Northeast of the U.S.

The primary source of data was a survey. In developing the quantitative portion of the survey, we drew on Oxford's (1990) six categories of language learning strategies and Wang's (2004) learning strategy protocols used for elementary English learners. Importantly, as the present study aimed to probe the Chinese graduate students' unstructured strategy use to learn English so that they can better cope with their disciplinary areas of study, the strategies being used need to be self-initiated and implemented rather than through explicit ESL instruction. The survey contained 40 statements of different learning strategies, and each participant was asked to rate his or her choice of the strategies on a scale of four: 1 being "I never use it;" 2 being "I seldom use

it;" 3 being "I sometimes use it;" 4 being I often use it." In addition to the 40 statements, there is a qualitative portion in the survey, which consists of three open-ended survey questions (see the Appendix). Both parts center on the participants' more spontaneous use and experience of learning strategies to help them learn English in a U.S. context.

The purpose of the study was explained to the participants first. With their consent, a hard copy of the survey in a stamped, addressed envelope was provided to each participant for him or her to mail back upon completion within three weeks. In the end, 49 completed surveys from 23 Master's students, 24 doctoral students, and two post-doctoral researchers were received; the return rate is 61.25%. Of the 49 participants who came from 24 graduate fields of study, 25 are male, and 24 are female students. For data analysis purpose, the two postdoctoral researchers were grouped together with the doctoral students.

A content analysis method was used to analyze the qualitative portion of the data (i.e., responses to the three open-ended questions). For the quantitative portion (i.e., the 40 strategies), the SPSS program was used for statistical analysis. Specifically, every participant's choices of the 40 strategies, as well as other participant information (e.g., gender, years of stay in the United States, and area and degree of study), were entered into the SPSS program, which was run to generate the means and standard deviations for each strategy choice. Analysis of variance (ANOVA) was employed to examine differences of the strategy use between groups of participants. The confidence level chosen for the statistical test was 95%, and the effect size reported in this study was  $\eta^2$ . According to Cohen (1988), the effect size is considered small if  $\eta^2 = .01$ ; medium if  $\eta^2 = .06$ ; and large if  $\eta^2 = .15$ . Finally, the qualitative and quantitative analyses were cross-referenced for triangulation. The

results are presented below.

## Results

The data analyses yielded mixed results about these graduate students' self-regulated strategy use and their English proficiency. Regarding the first research question (*What are the most common learning strategies self-implemented by these Chinese graduate students in the U.S.?*), these four most frequently used strategies are: 1. Strategy #40, "I talk back in English when someone speaks English to me" ( $M = 3.89, SD = 0.46$ ); 2. Strategy #4, "I take course notes in English" ( $M = 3.63, SD = 0.76$ ); 3. Strategy #5, "I keep reading even when I encounter difficulties in my reading" ( $M = 3.51, SD = 0.54$ ); and 4. Strategy #11, "I guess the meaning of new words by considering their contexts" ( $M = 3.49, SD = 0.74$ ). More detailed descriptive statistics are shown in Table 1. ( see the Appendix )

In comparison with the above frequently used strategies, the least commonly used strategies include the following ones: 1. Strategy #16, "I use Chinese symbols to mark the pronunciation of difficult English words" ( $M = 1.39, SD = 0.79$ ); 2. Strategy #38, "I keep a personal journal in English" ( $M = 1.96, SD = 0.96$ ); 3. Strategy #1, "I write down the mistakes I make in my use of English" ( $M = 2.00, SD = 0.87$ ); 4. Strategy #9, "I listen to tape-recording of an English text several times if I cannot understand it for the first time" ( $M = 2.06, SD = 0.94$ ).

The two-way ANOVA did not show a statistically significant interaction effect between gender and degree of study,  $F(1, 45) = 0.02, p = .90, \eta^2 < .001$ . As a result, each main effect was examined. For the second research question (*How do the male and the female students compare in their strategy choice?*), no statistically significant difference was noticed between male ( $M = 2.86, SD = 0.29$ ) and female students ( $M = 3.00, SD = 0.35$ )

regarding their strategy choice,  $F(1, 45) = 2.13, p = .15, \eta^2 = .05$ . Multiple comparisons between male and female participants on each of the 40 items on the strategy survey also failed to detect any statistically significant differences ( $p > .05$ ).

For the third question (*How the doctoral students and the master's students compare in their strategy choice?*), no statistically significant difference was found between Master's ( $M = 2.96, SD = 0.37$ ) and doctoral students ( $M = 2.90, SD = 0.28$ ) in their strategy choices,  $F(1, 45) = 0.07, p = .15, \eta^2 = .001$ . Multiple comparisons between doctoral and master students on each of the 40 items on the strategy survey also failed to detect any statistically significant differences ( $p > .05$ ).

As with the fourth research question (*How do they articulate their experience learning English as a unique cohort of international students in the U.S.?*), the qualitative data reveal the participants' varied experiences and perspectives on studying and using English, ranging from their difficulties in fully participating in class discussions, issues with academic writing, and isolations from taking part in any sociocultural activities outside of studies. The most common frustration expressed by the respondents was that their poor English often kept them from writing strong academic papers, making clear and clean class presentations, or exhibiting their full academic capacity and sophisticated thinking. Many participants indicated that they used simple words, short sentence structures, and familiar (yet less colorful) expressions to write reports because of fear to make grammatical mistakes. Several respondents also felt it hard to make personal friends with other native students. For instance, one male Master's student admitted that "my spoken English is adequate for a general conversation, but [it is] not enough for an in-depth discussion with native speakers in class." There can be covert hurdles for communication, too. As



experienced by one female Master's student, "I am good at daily talk, but I have to organize the words in my head before speaking them out in formal discussions. Especially in dealing with academic situations, I tend to get nervous and forget what to say." One female doctoral student wanted to be able to speak accurately and vividly, not to sound like reading from a book. One respondent's remark seemed to have captured a collective sentiment of the group: "English becomes a bottleneck of both my social life and academic life."

The findings also show many of the respondents took painstaking efforts to work on their English skills, on top of dealing with their disciplinary studies. Some reported to have coped with their low English proficiency by copying common English idioms and key terms for memorization, visiting the Writing Center to have their academic papers edited, or using intensive reading method to better comprehend an assigned article or book chapter before leading a discussion about its content in class. Additionally, several respondents tried watching TV, practicing with native speakers, and improving comprehension through reading books. Another respondent wanted to read news in English, instead of Chinese. One female Master's student even desired to take some academic writing and/or communication courses to sharpen her skills for spoken English and class presentation.

### **Discussion**

Consistent with Nisbet et al.'s (2005) research, this study failed to see statistically significant differences of the SRL strategy use between male and female students. As gender differences were found between male and female students in Green and Oxford's (1995) study with respect to strategy use and in Kissau et al.'s (2009; 2010) study with respect to motivation to learn a second language, future research should keep investigating gender differences. Our study also failed to find any statistically significant differences

between doctoral and master students in their strategy use, and most previous studies always grouped these students together (e.g., Kim, Wang, & Ng, 2010), it might not be worthwhile to separate doctoral and master students in future studies.

As reflected by the above findings, the participants faced many language obstacles studying in a non-native environment. This is not unlike the linguistic challenges confronting graduate students from Japanese, Korean and other linguistic and cultural backgrounds (Ma, 2008; Morita, 2000). In order to cope with the inevitable academic challenges, these advanced students resorted, one way or another, to some familiar learning practices. Meanwhile, they have to switch from their first language to thinking, learning and interacting in a new language, further complicating their learning, thinking, and participation in their studies. As intellectually sophisticated and resourceful learners, many of them compensated for their linguistic inadequacy largely by working harder and by using various known learning strategies from their prior English-learning experiences in China. The findings of this study help us better understand how they employ various self-regulated strategies to better their English skills in the United States.

These findings have implications for the mainstream educational community and for other Chinese students currently studying in the United States or planning to embark such educational journeys. It seems obvious that just memorizing many English words or a set of grammatical rules for sentence structures, helpful as they are, is simply not enough. In order to be able to deal with the academic challenges and participate actively in the learning processes, all non-native speakers of English really need to pay close attention to and acquire actual skills in using English for real-life communication. Self-regulated learning strategies, as Oxford's (2011) recent work emphasizes, are critical to continue

improving English learners' proficiency.

These findings may inform educators and researchers who have invested interest in Chinese students' English and educational development in the United States. Clearly, knowing what strategies these graduate students use to cope with their studies in English is only a beginning step. With more such research, it is possible to build a bigger collection of proven learning strategies for Chinese students in the United States. In addition, any innovative measures that effectively improve their linguistic proficiency would be helpful to maximize their learning, thinking, and understanding in science, technology, engineering, mathematics (STEM) and other disciplinary areas.

Perhaps some lessons may be learned for the English language education enterprise in China as well. As described in the literature review (cf. Ma, 2010; Zhao, 2009), classroom teaching and learning in China is heavily teacher-directed and test-oriented, where all kinds of standardized examinations dominate the curriculum. It is the same with English instruction, from the National College Entrance Examination in English (*Gaokao*) to the Band Four and Band Six English Test at the college and graduate levels. It seems obvious that the student's ability to actually use English, not static English usage, or test-taking skills, is what matters ultimately. In spite of their overall strong performance in various disciplinary fields, the evidence that so many Chinese students find it difficult to read English texts critically, write reports analytically, present ideas clearly or engage in discussions suggests that the English curriculum and instruction in Chinese schools need to be reformed.

Finally, some limitations must be acknowledged. Firstly, because this study involved a relatively small number of participants, one can only cautiously consider the extent to

which the strategy use may be linked to other students from China. Secondly, as graduate students come from many fields of study and in vastly different settings, the self-regulated strategy use may change as they gain more experience in the United States. Moreover, relying on surveys may not be adequate; other sources of data (e.g., field observations, follow-up interviews, and artifacts) may add valuable information to better understand not only what is reported by the participants, but also how they actually employ various strategies for real-life communication.

Future studies need to expand the scope (e.g., to include more participants), length of investigation (e.g., to conduct more than one survey over time), as well as to adopt multiple theoretical lenses to reflect a broader range of participant diversity and methodological complexity in order to depict a more holistic and dynamic picture of Chinese graduate student's SRL strategies for English and other disciplinary areas in the United States.

## References

- Abraham, R. G., & Vann, R. J. (1987). Strategies of two language learners: A case study. In A. Wenden & J. Rubin (Eds.), *Learner strategies in language learning* (pp.133-144). Englewood Cliffs, NJ: Prentice/Hall International.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bremner, S. (1999). Language learning strategies and language proficiency: Investigating the relationship in Hong Kong. *Canadian Modern Language Review*, 55, 490-514.
- Chamot, A. U., & El-Dinary, P. B. (1999). Children's learning strategies in language immersion classrooms. *The Modern Language Journal*, 83, 319-338.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, A. D., & Macaro, E. *Language learner strategies: Thirty years of research and practice*. Oxford, UK: Oxford University Press.
- Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3<sup>rd</sup> ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Diaz, R. M., Neal, C. J., & Amaya-Williams, M. (1990). The social origins of self-regulation. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology* (pp.127-154). New York: Cambridge University Press.
- Dreyer, C., & Oxford, R. L. (1996). Learning strategies and other predictors of ESL proficiency among Afrikaans speakers in South Africa. In R. L. Oxford (Ed.),

- Language learning strategies around the world: Cross-cultural perspectives* (pp. 61-74). Honolulu, HI: University of Hawaii at Manoa.
- Ehrman, M. E., Leaver, B. L., & Oxford, R. L. (2003). A brief overview of individual differences in language learning. *System*, 31, 313-330.
- Foong, K. P., & Goh, C. M. (1997). Chinese ESL students' learning strategies: A look at frequency, proficiency, and gender. *Hong Kong Journal of Applied Linguistics*, 2(1), 39-53.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2010). *Applying educational research* (6<sup>th</sup> ed.). Boston: Allyn and Bacon.
- Green, J. M., & Oxford, R. L. (1995). A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly*, 29, 261-297.
- Griffiths, C. (2008). *Lessons from good language learners*. Cambridge, UK: Cambridge University Press.
- Holschuh, J. P., & Aultman, L. P. (2008). Comprehension development. In Flippo, R. F. & Caverly, D. C. (Eds.), *Handbook of college reading and study strategy research* (pp. 121-144). London, UK: Routledge.
- Institute of International Education. (2010). *Open doors 2010*. Retrieved from <http://www.iie.org/en/Research-and-Publications/Open-Doors>
- Kim, D. H., Wang, C., & Ng, K. M. (2010). A Rasch rating scale modeling of the Schutte self-report emotional intelligence scale in a sample of international students. *Assessment*, 17, 484-496.
- Kissau, S., Kolano, L., & Wang, C. (2010). Perceptions of gender differences in high school students' motivation to learn Spanish. *Foreign Language Annals*, 43, 703-721.

- Kissau, S., Quach, L., & Wang, C. (2009). The impact of single-sex instruction on student motivation to learn Spanish. *Canadian Journal of Applied Linguistics*, 12 (2), 54-78.
- Ma, W. (2008). Participatory dialogue and participatory learning in a discussion-based graduate seminar. *Journal of Literacy Research*, 40, 220-249.
- Ma, W. (2010). Bumpy journeys: A young Chinese adolescent's transitional schooling across two sociocultural contexts. *Journal of Language, Identity, and Education*, 9, 107-123.  
doi: 10.1080/15348451003704792
- Morita, N. (2004). Negotiating participation and identity in second language academic communities. *TESOL Quarterly*, 38, 573-603.
- Nisbet, D. L., Tindall, E. R., & Arroyo, A. A. (2005). Language learning strategies and English proficiency of Chinese university students. *Foreign Language Annals*, 38, 100-107.
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. New York: Newbury House Publishers.
- Oxford, R. L. (2011). *Teaching and researching: Language learning strategies*. New York: Pearson.
- Oxford, R. L., & Burry-Stock, J. A. (1995). Assessing the use of language learning strategies worldwide with the ESL/EFL version of the strategy inventory for language learning (SILL). *System*, 23, 1-23.
- Pape, S. J., & Wang, C. (2003). Middle school children's strategic behavior: Classification and relation to academic achievement and mathematical problem-solving, *Instructional Science*, 31, 419-449.

- Prior, P. A. (1998). *Writing/disciplinarity: A sociohistoric account of literate activity in the academy*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist*, 32, 195-208.
- Stevenson, H. W., & Stigler, J. W. (2006). *The learning gap: Why our schools are failing and what we can learn from Japanese and Chinese education* (2<sup>nd</sup> ed.). New York: Simon and Schuster.
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social psychology*, 246-260.
- Watkins, D. A., & Biggs, J. B. (Eds.). (2001). *Teaching the Chinese learner: Psychological and pedagogical perspectives*. Hong Kong: The University of Hong Kong Press.
- Wang, C. (2004). *Self-regulated learning strategies and self-efficacy beliefs of children learning English as a second language*. (Unpublished doctoral dissertation, Ohio State University). Retrieved from <http://drc.ohiolink.edu/handle/2374.OX/4603>
- Wang, C., Quach, L., & Rolston, J. (2009). Understanding English language learners' self-regulated learning strategies: Case studies of Chinese children in U.S. classrooms and home communities. In C. C. Park, R. Endo, S. J. Lee, & X. L. Rong (Eds.), *New perspectives on Asian American parents, students, and teacher recruitment* (pp.73-99). Charlotte, NC: Information Age Publishing.
- Wong, J. S. (1950). *Fifth Chinese daughter*. New York: Harper & Brothers.



- Wu, S., & Rubin, D. L. (2000). Evaluating the impact of collectivism and individualism on argumentative writing by Chinese and North American college students. *Research in the Teaching of English*, 35, 148-178.
- Zhao, Y. (2009). *Catching up or leading the way: American education in the age of globalization*. Alexandria, VA: ASCD.
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, 23, 614-628.

## Appendix

## Self-Regulated Learning Strategies to Study English

Name (optional):

Date:

Gender: Male/Female

Years of Stay in the USA:

Program of Study:

Level of Study: Master's/Doctoral

**Notes:** Please circle one answer for each of the 40 statements according to your actual situation. As this is a survey about how Chinese graduate students study and use English in an American context and what concerns they may have about their English proficiency, there are no right or wrong answers for any choices. Additionally, not all the learning strategies listed here are good ones, and you may have your own preferred strategies. Nevertheless, the survey will help me better understand which strategies you actually use and the frequency you use them.

	1	2	3	4
	I never use it.	I seldom use it.	I sometimes use it.	I often use it.
The Statement of Self-Regulated Learning Strategies	Your Choice			
1. I write down the mistakes I make in my use of English.	1	2	3	4
2. I form an outline before writing my paper in English.	1	2	3	4
3. I review the English texts that I have read.	1	2	3	4
4. I take course notes in English.	1	2	3	4
I keep reading even when I encounter difficulties in my reading.	1	2	3	4
I ask others for help when I have questions with my English.	1	2	3	4
I search other sources when I have difficulties understanding an	1	2	3	4

English text.

8. I summarize the main idea of an article after I read it.	1	2	3	4
I listen to tape-recording of an English text several times if I cannot understand it for the first time.	1	2	3	4
10. I pay attention to what pronouns refer to in the text.	1	2	3	4
. I guess the meaning of new words by considering their contexts.	1	2	3	4
. I guess what people mean by following their facial expressions and movements when watching an English movie.	1	2	3	4
. I read or copy new words many times to memorize the spellings.	1	2	3	4
. I proofread my composition after I complete my writing.	1	2	3	4
. I pay attention to the stressed words or phrases to help me comprehend spoken English.	1	2	3	4
. I use Chinese symbols to mark the pronunciation of difficult English words.	1	2	3	4
. I use the title of an article to predict its content.	1	2	3	4
. I predict what other people will say next based on what they have already said.	1	2	3	4
. I look at a listener's facial expressions to check if he or she understands me or not.	1	2	3	4
. I imagine the scene described in the story to help me memorize what I have read.	1	2	3	4
21. I send emails to friends in English on my initiative.	1	2	3	4
. I compare and contrast any similarities and differences in usage	1	2	3	4

between English and Chinese.

. I ask others to speak slowly if I cannot follow them.	1	2	3	4
. I try to find opportunities to practice my spoken English.	1	2	3	4
. I rehearse how to say something in English in my mind before saying it out loud.	1	2	3	4
26. I watch television programs in English on my initiative.	1	2	3	4
. I study new words by analyzing their prefixes and suffixes.	1	2	3	4
. I like to use different English expressions to state the same idea.	1	2	3	4
. I translate what I read into Chinese to help me comprehend it.	1	2	3	4
30. I pay attention to native English speakers' intonation.	1	2	3	4
. I adjust my reading speed according to the difficulty of the text.	1	2	3	4
. I use background knowledge to help me understand what I am reading.	1	2	3	4
33. I underline key points during my reading in English.	1	2	3	4
. I give a topic sentence in each paragraph in my writing.	1	2	3	4
. I check my writing to make sure that the rest of the paragraph supports the topic sentence.	1	2	3	4
. I use words just learned to make new sentences on my initiative.	1	2	3	4
. I speak English outside of my courses.	1	2	3	4
. I keep a personal journal in English.	1	2	3	4
. I read books in English not required by my class.	1	2	3	4
. I talk back in English when someone speaks English to me.	1	2	3	4

Additionally, please respond to the following four questions.

1. What are your thoughts about your English proficiency?
2. In what ways, if any, does your English affect your academic study?
3. If you could change any of your English skills, what are five most important things that you would like to change?

Table 1

*Descriptive Statistics of 40 Self-Regulated Learning Strategies*

Items	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>
I write down the mistakes I make in my use of English.	49	1.00	4.00	2.00	.87
I form an outline before writing my paper in English.	49	1.00	4.00	3.08	1.04
I review the English texts that I have read.	49	1.00	4.00	2.67	.92
I take course notes in English.	49	1.00	4.00	3.63	.76
I keep reading even when I encounter difficulties in my reading.	49	2.00	4.00	3.51	.54
I ask others for help when I have questions with my English.	49	1.00	4.00	3.14	.76
I search other sources when I have difficulties understanding an English text.	49	1.00	4.00	3.41	.84
I summarize the main idea of an article after I read it.	49	1.00	4.00	2.57	.89
I listen to tape-recording of an English text several times if I cannot understand it for the first time.	49	1.00	4.00	2.06	.94
I pay attention to what pronouns refer to in the text.	49	1.00	4.00	2.69	.82
I guess the meaning of new words by considering their contexts.	49	1.00	4.00	3.49	.74

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I guess what people mean by following their facial expressions and movements when watching an English movie.	49	1.00	4.00	3.39	.84
I read or copy new words many times to memorize the spellings.	49	1.00	4.00	2.67	1.03
I proofread my composition after I complete my writing.	49	2.00	4.00	3.29	.76
I pay attention to the stressed words or phrases to help me comprehend spoken English.	49	1.00	4.00	2.90	.77
I use Chinese symbols to mark the pronunciation of difficult English words.	49	1.00	4.00	1.39	.79
I use the title of an article to predict its content.	49	1.00	4.00	3.08	.81
I predict what other people will say next based on what they have already said.	49	1.00	4.00	2.98	.90
I look at a listener's facial expressions to check if he or she understands me or not.	49	1.00	4.00	3.45	.68
I imagine the scene described in the story to help me memorize what I have read.	48	1.00	4.00	3.00	.92
I send emails to friends in English on my initiative.	49	1.00	4.00	2.94	.94
I compare and contrast any similarities and differences in usage between English and Chinese.	48	1.00	4.00	2.69	.75
I ask others to speak slowly if I cannot follow them.	49	1.00	4.00	3.14	.82
I try to find opportunities to practice my spoken English.	49	1.00	4.00	3.08	.76
I rehearse how to say something in English in	49	1.00	4.00	2.94	.77

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my mind before saying it out loud.					
I watch television programs in English on my initiative.	49	1.00	4.00	2.86	.94
I study new words by analyzing their prefixes and suffixes.	49	1.00	4.00	2.76	.83
I like to use different English expressions to state the same idea.	49	1.00	4.00	2.76	.75
I translate what I read into Chinese to help me comprehend it.	49	1.00	4.00	2.43	.79
I pay attention to native English speakers' intonation.	49	1.00	4.00	3.10	.82
I adjust my reading speed according to the difficulty of the text.	49	2.00	4.00	3.31	.55
I draw on my background knowledge to help me understand what I am reading.	49	2.00	4.00	3.43	.61
I underline key points during my reading in English.	49	1.00	4.00	3.12	.93
I give a topic sentence in each paragraph in my writing.	49	1.00	4.00	2.90	.82
I check my writing to make sure that the rest of the paragraph supports the topic sentence.	49	1.00	4.00	2.98	.83
I use words just learned to make new sentences on my initiative.	49	1.00	4.00	2.59	.70
I speak English outside of my courses.	49	2.00	4.00	3.16	.80
I keep a personal journal in English.	49	1.00	4.00	1.96	.96
I read books in English not required by my class.	49	1.00	4.00	2.88	.83
	49	2.00	4.00	3.86	.46

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I talk back in English when someone speaks	
English to me.	
Valid N (listwise)	45

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Homeschooled Students in College:  
Background Influences, College Integration, and Environmental Pull Factors

Mary Beth Bolle-Brummond

Roger D. Wessel

Abstract

How do pre-entry attributes of homeschooled students influence their college experience? What are their academic and social integration patterns? What role did outside factors play in their college experience? Using Tinto's research as a foundation, this study examined the influence of pre-entry attributes on the college experience, academic and social integration patterns, and environmental pull factors of college students who were homeschooled in high school. The authors found that homeschooled students were equipped to succeed academically and socially. Outside influences encountered by the participants included work, family, and finances.

There were an estimated 1.5 million homeschooled students in k-12 settings in the United States during the spring of 2007 (Bielick, 2008). Homeschooling has become increasingly more common, rising from 300,000 students in 1991, to 850,000 students in 1999 (Bielick, Chandler, & Broughman, 2001), to 1,096,000 students in 2003 (Princiotta, Bielick, & Chapman, 2004), to

1,508,000 students in 2007 (Bielick, 2008). While it is difficult to know with certainty, Cox (2003) suggested that about 30,000 homeschooled students begin college each year.

The transitional first year of college for homeschooled high school students, the focus of a study by [Authors' identities concealed] (2007), identified issues that were prominent during the first year of college (e.g., leaving home, independence, meeting others with different world views) and several institutional interventions that were helpful to them. Five years later the authors returned to the same individuals that matriculated in fall 2005 to explore, from a longitudinal perspective, the influence of their homeschool background on the college experiences, including their academic and social integration into college, and environmental pull factors, such as work, finances, and family commitments.

### **Literature Review**

The theoretical foundation for this study rests with the literature on transition to college, the role of involvement, and outside influences in college success. Tinto (1993) developed the model of institutional departure, adapted from Van Gennep's [1909, 1960] studies on assimilation. This model consisted of three stages: separation from past communities, transition between high school and college, and incorporation into the college community. The model suggested that pre-entry attributes, such as an individual's family background, talents, and prior education influence a student's degree commitment and can play a role in institutional departure. In addition to these background influences, Tinto (1975) also discussed academic and social integration in relation to the person-environment fit and associated these with a student's retention, involvement, and persistence to graduation. Regarding academic integration, intellectual development was a reflection of the student's intellectual integration into the academic system, often measured

in terms of grade performance. Social integration took place primarily through informal peer group associations, interaction with faculty and administration personnel, and semi-formal extracurricular college activities. Of the multiple forms of social interaction that occur during college, peer group associations appeared to have the greatest influence on a student's social integration; with extracurricular activities and faculty interactions appearing to be equal in secondary importance. The greater the student's level of social and academic integration, the greater the student's commitment to the institution and to graduation.

Pascarella and Terenzini (1980, 1983), building on Tinto's model, identified the strong contribution that student-faculty relationships made toward social and academic integration. In both their formal teaching and informal nonteaching roles, the quality and influence of student-faculty relationships contributed positively to a student's sense of integration. The results of Pascarella and Terenzini's investigations affirmed Tinto's assertion that persistence/withdrawal behavior is the result of a longitudinal process of person-environment fit. Nora, Barlow, and Crisp (2005) expanded Tinto's notion of student interactions within the academic and social systems of an institution to include outside environmental push and pull factors (e.g., family responsibilities, work responsibilities, commuting to college), formal interactions with faculty, involvement in learning communities (i.e., in-class experiences, out-of-class collaborative learning), campus climates (e.g., perceptions of prejudice/discrimination, tolerance versus acceptance), and validating mentoring experiences.

### **Homeschooled College Students**

Many authorities are concerned about homeschooled students' success in college. The most common concern is a fear that homeschooled students lack socialization (Luebke, 1999). Sutton and Galloway (2000) examined the undergraduate experiences of high school students from three different secondary educational backgrounds (i.e., public school, private school, and homeschool) and measured success based on five factors (i.e., achievement, leadership, professional aptitude, social behavior, and physical activity). They found little difference in the areas of achievement, professional aptitude, social behavior, and physical activity based upon the school environment. They concluded that all three types of educational settings prepared students for a college career of comparable achievement, aptitude, social skills, and physical activity. Holder (2001) found that homeschooled students were academically and socially adept, demonstrating the ability to learn on their own, maintain good study habits, be self-motivated, exhibit responsibility, be flexible in learning at their own pace, and maintain self-discipline. While homeschooled students assimilated well to the social environment of college, they encountered challenges adjusting academically such as writing research papers, meeting assignment deadlines and managing time, and getting accustomed to class schedules.

[Authors' identities concealed] (2007) examined the transitional experiences of traditional-age, matriculating, first-year college students, who graduated from high school in a homeschool setting. The qualitative study sought answers regarding what transitional issues homeschooled students encountered in adjusting to college life, how were these issues related to Tinto's (1975, 1993) theory of institutional departure, and what institutional interventions at the university aided or hindered the transition. As the students transitioned to college life, those who lived on-campus indicated feelings of

loneliness after leaving home. However, they also enjoyed their newfound independence. They encountered others with value systems different than their own and developed a new identity away from parents and home friends. The participants were also involved in co-curricular activities at various levels and indicated that the college experience helped them develop confidence. The authors also found that meeting others from different worldviews was especially spiritually enlightening for the homeschooled students. The students appreciated the opportunities and skills homeschooling provided them, and indicated that homeschooling equipped them with time management and study skills needed to be successful in college. Several institutional interventions that were helpful in the students' transition to college were cited. Orientation helped them adjust to college life, Resident Assistants had a positive impact, and student organizations served as a location to meet others with similar interests. The authors noted that the transitional issues these students encountered during their first year of college were closely related to the three stages of separation, transition, and incorporation identified in Tinto's (1993) theory of institutional departure. As they left home, the participants experienced separation and periods of loneliness. The second stage, transition, was experienced on different timelines among the students. Some participants quickly disassociated themselves from their life at home while others took longer to make friends and leave their shell. The third stage of incorporation was experienced as the students began to refer to college as "home," adjusted to college academics, and built their own community of friends.

There is a void in the literature on academic and social integration patterns of homeschooled students after their transitional year. How do they experience college? Are their experiences different than other students? The purpose of this study was to examine

the longitudinal transition and integration of college students who were homeschooled in high school in order to identify how prior experiences affected integration and transition, determine the role that social and academic integration played in persistence to graduation, and understand how environmental factors influenced the students' college experiences. The study sought to answer three questions.

1. How did the homeschooled students' pre-entry attributes influence their college experience?
2. What are the academic and social integration patterns of homeschooled students?
3. How do outside environmental pull factors experienced during college influence homeschooled students?

## **Method**

### **Design of Study**

Qualitative research methodology was chosen based on the researchers' belief that the best way to understand the college experiences was through questioning, understanding, and analyzing individual experiences, searching for common themes among these experiences, and comparing these experiences to Tinto's (1975, 1993) theoretical framework. The phenomenological study was conducted as a longitudinal follow up to the study conducted by [Authors' identities concealed] (2007) that examined the transitional issues of first-year college students who were homeschooled in high school. At the university where the initial research was conducted (Midwest State, pseudonym), a mid-sized, public, primarily residential, research university in the Midwest, the six students

originally interviewed were contacted five years after the initial interview for a follow-up interview. Five students participated.

### **Data Collection**

Personal interviews were conducted. A semi-structured interview guide was created based on the guide used by [Authors' identities concealed] (2007). Questions were modified and developed according to the study's primary research questions, informed by the theoretical framework. They were organized to address separation from home and transition to college, academic experiences, social experiences, and environmental pull factors. Examples of the questions asked of students were "How did your homeschool experience prepare you for college academics? How did being homeschooled influence your social experiences in college in any way? While in college, how did outside responsibilities influence your college experience?"

To increase the trustworthiness of the instrument, the interview guide was reviewed by a panel of experts who were experienced university educators working with homeschooled students in college. The interview guide was also pilot tested with former and current students who were homeschooled in high school and had attended college. The panel of experts and the pilot group provided suggestions to improve the guide. After approval by the Institutional Review Board, interviews were conducted and lasted about one hour. They were audio recorded and transcribed. The informants' personal information was kept confidential by usage of pseudonyms. During the interviews, the researchers adhered to the suggestion of Lofland and Lofland (1984) to write brief notes during the interview process to help in creating field notes. Field notes, according to Bogdan and Biklen (1982), are "the written account of what the researcher hears, sees, experiences, and thinks in the course of collecting and reflecting on the



data” (p. 108). We also utilized reflexivity. Through reflexivity we examined “the ways in which a researcher's involvement with a particular study influences, acts upon and informs such research” (Nightingale & Cromby, 1999, p. 228). One researcher’s personal experiences, as a homeschooled student who completed college, informed the data collection process. All of these methodological techniques were used to increase the trustworthiness of the data.

### **Data Analysis**

Data analysis was multifaceted and was based on the open and axial coding techniques described by Strauss and Corbin (1990). This type of data analysis is iterative in nature and required the researchers to visit the data multiple times. We utilized the constant comparative analysis method (Glaser & Strauss, 1967) to modify and develop how participants integrated academically and socially to college. In evaluating the credibility, dependability, and confirmability of the study, we adhered to the recommendations of Lincoln and Guba (1985) for qualitative research studies. We used member checking (full transcript review for accuracy) to further improve credibility and dependability.

### **Findings**

The findings begin with a discussion of the participants’ pre-entry attributes and demographics related to their background as homeschooled students. Then academic and social experiences and integration are discussed, followed by a review of environmental pull factors.

#### **Pre-Entry Attributes**

**Demographics.** Three female students and two male students took part in the study. All five participants had been homeschooled throughout high school, and were traditional-aged when they began their college career.

- Rebecca – The eldest of twelve children, Rebecca identified herself as coming from a religious and sheltered background. While in college, she questioned her values and experienced a profound personal transformation. After her freshman year, Rebecca worked on-campus. She completed her bachelor's degree in three years, with a major in history, and then attended graduate school.
- John – John's father worked at Midwest State and John initially selected this university in part because of the tuition discount. He was a student worker in the computer services department. John completed only three semesters and indicated that he did not continue because of financial reasons; he also struggled academically during his final two semesters. While he did not continue his education elsewhere, he intended to attend college in the future.
- Eva – An in-state student, Eva's parents had both attended Midwest State. Eva was involved in Campus Crusade for Christ and joined a professional business fraternity her junior year. She worked on-campus in a computer lab and completed a double-major in marketing and hospitality and food management. Eva graduated within four and a half years.
- Jeff – When Jeff initially selected Midwest State, his parents' were living out-of-state, but they moved closer during his first semester. Jeff appreciated the distance from his parents and joined a social fraternity in his freshman year. He majored in architecture and graduated within four years.
- Sidney – Sidney lived off-campus, commuted, and was married. She had a baby during the end of her first semester at Midwest State. Sidney failed her first two semesters at Midwest State and withdrew from her third term. After a brief

career in the military, she began attending a local propriety school that offered career focused degrees.

**Degree Commitment.** All except one of the participants indicated a strong commitment to obtain a college degree. The students expressed various influential factors in their level of commitment such as parental expectations and a desire to improve life for themselves and their families. They also valued learning and acquiring knowledge. The participant who was not very committed to graduating withdrew after his third semester. Rebecca was very committed to her academic pursuits, largely because of the value that she and her parents placed on education. However, Rebecca indicated that she was raised with the belief that it was not a woman's role to have a career. Initially a motivating factor was the desire to have a degree as something to "*fall back on,*" should she need to support herself. Rebecca's beliefs on the role of women changed during her time in college. After she completed her bachelor's degree, she earned a master's degree, and was pursuing her Ph.D.

John was the only student who explained that he was not very committed to obtaining a degree. "*There was very little that I thought that college could offer me, that I couldn't learn on my own, cheaper.*" For John, a degree was a helpful piece of paper when trying to find a job. He believed he could learn just as effectively on his own, and felt that internet searching was more productive than college coursework.

**Influence of Homeschooled Background.** The students acknowledged that being homeschooled influenced their social and academic experiences in college, but described the influence in neutral terms. For example, when group conversations turned to discussion of high school experiences with teachers or friends, the students didn't have any

shared experiences to add. Or because of being homeschooled, they didn't know high school classmates who were attending Midwest State. For example, Eva shared that she didn't have high school classmates who were attending Midwest State. Some students indicated that they had not been exposed to much pop culture while homeschooled. When references were made to certain movie stars or popular songs in conversation, they sometimes did not understand the reference.

Academically, students had to get used to classes being at a specific time, but were prepared to complete reading and assignments on their own. Jeff felt well prepared and explained that many of his core classes, such as chemistry and history, seemed to be a repeat of high school coursework. Eva had to adjust to different teaching styles. She also felt she might have been challenged more academically in a traditional high school setting, where students are ranked. She shared, *"I might not have been pushed as much as I probably could have been, or should have been, if I was in more of a public setting. Because you have the, just all of the pressure, of like 'Oh you want to be the top student' . . . Being homeschooled I was the only student, so you don't have quite that pressure all the time."*

John did indicate some initial challenges in learning how to meet people and socialize, and credited this to his background being homeschooled. While he had to work at it in the beginning, John adapted quickly. On the other hand, he also partially credited homeschooling to preventing him from segregating fellow students into cliques or stereotypes. As he explained, *"I didn't have any preconceived ideas . . . I was familiar with such stereotypes from media, TV, movies, stuff like that, but they never really mattered to me."* Because of this openness, he developed a social circle of friends with varied backgrounds.

### **Academic Experiences and Integration**

**Academic Preparedness.** The students felt that homeschooling had prepared them well for college academics. They specifically credited their educational background with preparing them to be self-motivated and organized learners. Both John and Eva indicated that homeschooling equipped them with the ability to figure things out on their own. Rebecca was surprised that she got good grades by doing what she described as merely following the syllabus. She explained, *“I got A’s in all of my classes, I couldn’t understand it at first. I couldn’t understand how I got the grade for doing nothing more than what the syllabus asked. I didn’t feel like I was doing anything special.”*

The students also indicated some specific aspects of the traditional academic setting that they had to adjust to. These included adapting to different professors’ teaching styles and having to attend class at a set time. However, two of the students had taken college courses while in high school, and thus had some prior experience in a traditional setting.

One student, Sidney, did not feel well prepared for college academics. While homeschooled, her mom worked often and Sidney only completed the requirements necessary for graduation. In her homeschool coursework she just *“did what had to be done, to pass the class”*. Sidney struggled academically and failed her first two semesters. It was difficult for her to learn and feel supported academically in her large classes of 200+ people.

**Academic Participation.** Initially class attendance and completion of assignments were priorities for all of the students. However, over time there was a marked difference in class attendance and participation between the students who graduated and those who withdrew. For Rebecca, Eva, and Jeff, who graduated from Midwest State, class attendance, participation, and completion of assignments was important throughout their college

careers. These students developed ways to balance studying and academic commitments with social time. Rebecca devoted a large amount of time to studying and viewed pursuing her degree as her *"job."* Eva chose not to work during her freshman year, so she could focus on her studies, but also indicated that she took time off to be with friends and relax. During his first year, Jeff went to every class and completed every assignment. As time passed, he continued to complete all assignments, but missed class a few times. He explained, *"By senior year, I never missed more than two or three total classes per semester . . . the only reason I ever saw as a good enough reason to skip class was sleep."*

For both Sidney and John, who did not complete their degree at Midwest State, class attendance and preparedness decreased quickly. Sidney attended class less and less frequently during her first semester, eventually forgetting or failing to complete homework. While John went to class studiously at first, as time passed he would not attend class but just showed up to turn in assignments. Also, he indicated that drama within his social group distracted him from class attendance.

**Academic Relationships.** As the students attended classes, they interacted with their classmates and professors to varying degrees. All of the students except Sidney mentioned contacting professors for clarification on coursework or with questions about the material. Rebecca indicated that she sat near the front, was vocal in class, asked questions, and contributed to discussion. This enabled her to develop strong relationships with her professors, who recognized her and appreciated her contributions. Starting her sophomore year, she also worked as a teaching assistant. As Rebecca pursued her master's degree at the same institution, she kept in touch with some of these professors. One professor, whom Rebecca had had during her freshman year, and with whom she worked

with while completing her master's degree, gave her his *Chicago Manual of Style* as a good luck gift during her Ph.D. studies. Rebecca appreciated all that she learned from these relationships

The students mentioned study groups as beneficial in developing relationships with other classmates, but these relationships were largely casual. As Eva described: *"Definitely when you are in groups, you kind of build a community out of it. I would lean more towards those people I would be working with, and we would start small social things. I never got a best friend out of it or anything."* Depending on the nature of the project, the students frequently took a leadership role in group assignments. This was often motivated by the desire to earn a certain grade, and to ensure that the project was competently and successfully completed. John felt that professors intentionally paired him with students who were not as committed to projects.

### **Social Experiences and Integration**

**Making Friends.** As the students started their college career, they began to make friends and develop a social life. Some of the participants were proactive in getting to know others, others waited for fellow students to approach them. Oftentimes strong friendships were developed with students in the same residence hall. Relationships also developed out of participation in student organizations. Jeff quickly joined a fraternity to meet others and become a part of a community. John made friends as his residence hall neighbor invited him to hang out. He explained, *"He invited me out to Johnson's and we had a hot dog and just talked and just started hanging out and then from that, I did eventually become the center of a hub of friends."* Eva described herself as a *"social butterfly"* and was positive about the opportunity to meet new people. She joined Campus Crusade for Christ her freshman year

and took on a leadership role during later years. During her junior year, fueled by a desire to meet others with different values and broaden her social network, Eva joined a professional business fraternity. She described this as a learning experience that helped her transition to the work environment after graduation.

All of the students who lived on campus described their social experiences in a positive light, but some students identified challenges in getting to know others. While Rebecca connected with three girls at orientation, and later developed strong friendships with them, she felt her sheltered background created hurdles for her. She quickly noticed that she stood out because she dressed differently and didn't wear makeup. Besides her three close friends from orientation, Rebecca felt that others saw her as *"strange and different."* When she ran for a leadership office in her residence hall, Rebecca heard through hearsay that she was not voted for because fellow students feared she would impose a *"puritanical"* agenda. This was difficult for Rebecca; she explained that her hall mates *"saw me as different and strange and such, that year. And actually what happened, that summer, after the first year, I looked back and I didn't like some of the things that I stood out for, so I spent the entire summer getting into shape."* She also got new clothes and started wearing makeup.

Sidney, who commuted, did not develop any social connections with fellow classmates or participate in co-curricular activities. She explained, *"I went to class, I sat in my seat, I took my notes and I left."* With her outside responsibilities as a wife and mother, Sidney indicated that she felt much older than her peers. At the second smaller college Sidney attended, after her short career in the military, she made friends with classmates and kept in touch outside of class.



**Co-Curricular Involvement.** There was a marked difference in co-curricular involvement between the students who graduated and those who did not graduate. Each of the three students who graduated was involved in co-curricular activities such as fraternities, honorary societies, religious organizations, and sports clubs. Rebecca and Eva also took on leadership roles in various organizations during their later college years. Both John and Sidney, who did not graduate, did not indicate regular involvement in co-curricular activities. While John attended a few events on-campus, he did not join any clubs or organizations.

### **Environmental Pull Factors**

**Family.** Each of the participants indicated that their family was supportive of their decision to go to college. Many of the students' parents expressed a strong expectation that their child would attend college. Although parents and family members were supportive, this support was expressed in different ways. Jeff's parents expected him to at least give college a try for a few semesters. They believed it would be a good experience in transitioning to adult life. However, because Jeff's older brother dropped out of the private college he attended, his parents were unwilling to provide any financial support. Sidney indicated that her husband encouraged her to attend class. As a new wife and expectant working mother, she had many outside commitments vying for her time.

The students' largely indicated that their parents gave them freedom and flexibility to adjust and integrate into college life. Eva indicated that both her parents' had attended college at Midwest State. As she shared, *"They definitely encouraged being able to grow there and get what I needed done there. Of course they wanted to see me, but they were totally supportive in that."* One advantage Eva described in being homeschooled was that she did

not need to visit home to connect with old high school friends. Because of this, she was able to spend more time on campus and assimilate into the college community.

During her time in college, Rebecca re-examined the worldview imparted to her by her parents. This questioning led her to develop new beliefs and values. While her parents were strongly supportive of her education, they did not understand the changes in her values and beliefs. Rebecca indicated that her time home, during the summer between her second and third college years, was very difficult and that she felt attacked by her family.

She explained, *"My relationship with my parents changed dramatically, as I questioned their views. And like I said, the more I questioned them, the more the relationship changed."*

Because of the deterioration of her relationship with her parents, Rebecca did not go home the summer after her third year in college. She took on all of her living and school expenses and provided for herself.

**Employment.** All of the participants worked at some point during their college career. The four students who lived on-campus worked on-campus. Eva worked in a computer lab, where she was able to catch up on homework when things were slow. Jeff worked in the dining hall for his first year, but did not continue in the position because he felt that student employment jobs did not pay well and believed that his time could be better spent on other things. He decided to take out loans and pay them back after he graduated when he had more earning potential. Sidney was very busy working full-time while also attending Midwest State. Her family commitments, new baby, and work all influenced her success in college. As she explained: *"I wanted to succeed and stuff, but at that point I had just had my daughter, and then you know I was working full-time, trying to go to school full-time, trying to be a mom. And just, one thing had to go."*

**Withdrawing.** The two students who did not graduate credited their withdrawal largely to outside factors; however, there were also some factors within the college environment that contributed to their departure. John did not continue his academic studies due to lack of finances. However, John planned to attend and complete his degree in the future. His motivation to attend college in the future was more for the credential than for the knowledge gained. He noted: *"Some day I do intend, once I get a hold of the money, I do intend to go back and get that piece of paper, but it's more just for the piece of paper than for any other reason."* John also explained he had to work very hard to acclimate socially. As time passed, division and strife ensued within his diverse social group, who did not have anything in common with one another besides knowing John. Discord developed in the group, causing stress and drama for John. However, John did not indicate that social issues were his reason for withdrawing.

For Sidney, who failed her first semester, other commitments such as working and new motherhood took priority over school. She struggled to feel at home at Midwest State. After taking time off and joining the military, Sidney attended a smaller local college. She had many positive things to say about this college compared to Midwest State, *"There's a complete difference between going to Midwest State and going to [the smaller college]. One of them, you feel like you are a part of something . . . Everybody cares, everybody knows your name as soon as you walk in the door. At Midwest State your professor is struggling to remember your name."*

### **Discussion**

The discussion is organized based on conclusions drawn in relation to the study's three research questions: influence of pre-entry attributes, academic and social integration,

and environmental pull factors. Limitations of the study and recommendations for further research are offered.

### **Influence of Pre-Entry Attributes**

Nearly all of the students were largely prepared through homeschooling to be academically and socially successful. The students indicated that homeschooling equipped them with organizational skills and self-motivation in their studies. While they had to adjust to a formal educational setting and different teaching styles of their professors, this did not negatively affect the students' ability to learn and succeed. One student who withdrew after her third semester did explain that she did not feel academically prepared by homeschooling. However, she attributed her outside family and work commitments as preventing her from spending enough time on academics. This student began studies at a difference college a few years later. The participants' experiences are consistent with findings of Holder (2001), Lattibeaudiere (2000), and Sutton and Galloway (2000) indicating that homeschooled students were equipped with the academic skills necessary to succeed in college.

The homeschooled students did not have the same high school social relationships and experiences as their traditionally educated counterparts. However, the participants quickly met and developed relationships with fellow students. One student particularly appreciated the opportunity to develop new friendships while not having a commitment to prior relationships. Another student indicated that homeschooling allowed him to be less influenced by stereotypes, enabling him to be open-minded in developing friends from various backgrounds. This corresponds with the experience of homeschooled participants

in Holder's (2001) study, who indicated that they were less influenced by their peers and had more self-confidence.

One student's strongly religious family beliefs and background were largely different than those she encountered in college. She quickly realized that she stood out from her peers and experienced internal questioning of her original belief system. While this background was not necessarily related to her being homeschooled, it did create distinct challenges for her, and turmoil in family relationships during her time in college. This student's experience follows Tinto's (1993) assertion that students from unique or exclusive backgrounds may have greater difficulty in separating from their past identity and community. Also Lattibeaudiere (2000) found that homeschooled students from strong Christian backgrounds, who attended public universities, experienced greater challenges in transitioning to college than they initially expected. The student successfully met this challenge, completed her degree, and went on to graduate school.

While the students' background appeared to have a neutral affect on their transition, their level of degree commitment was strongly related to their success and persistence in college. The students who indicated a strong commitment to completing their degree either graduated or continued their education at a different institution after taking time off. The student who indicated low commitment to obtaining a degree withdrew. This is correlated with Tinto's (1993) theory that an individual's commitment and goals influences how they respond to the challenges encountered in transitioning to college. Nora et al. (2005) indicated that a higher level of educational ambition was positively correlated with student persistence.

The students' educational background and commitment to obtaining a degree had different levels of influence on their college experience and persistence. While the students' were equipped for college to varying degrees, their homeschool background did not seem to influence their persistence to graduation, or to negatively affect their college experience. On the other hand, the students' initial goal commitment appeared to have a larger influence on persistence. This is consistent with Pascarella and Terenzini's (1983) findings that background characteristics did not directly influence students' successful degree completion, but were "indirect, being transmitted through social and academic integration or subsequent institutional and goal commitment" (p. 222). It is also consistent with their conclusion that the long-term role played by students' pre-entry attributes and commitment was more accurately seen by how these factors influenced the students' first-year in college. Also, [Authors' identities concealed] (2007) found that the transitional issues encountered by homeschooled students in their first year of college were similar to those encountered by traditional students.

### **Academic and Social Integration**

The students who persisted to graduation exhibited strong involvement in both academics and co-curricular activities. Through involvement in religious organizations, fraternities, honorary societies, and residence hall associations, they developed friendships. After their first year, many students took on leadership roles in on-campus organizations. This compared with findings of other studies which demonstrated that homeschooled students were largely well socialized in college, at a level comparable with their traditionally educated counterparts (Holder, 2001; Lattibeaudiere, 2000; Sutton and Galloway 2000). According to Tinto (1993) involvement in student groups provides

opportunities for students to connect with peers and more fully incorporate into the college life. Pascarella and Terenzini (1983) found that there was a direct correlation between social and academic integration and an individual's persistence.

The students who graduated also took academics seriously and attained a high degree of academic integration. They attended class regularly, completed homework, and took on leadership roles in completing group projects. They viewed their studies as an important responsibility. Through classes, the students developed casual relationships with their peers and interacted out of class with professors. They asked professors for clarification on homework and also developed meaningful relationships with them. One student used an instructor as a reference for employment. Another stayed in close contact with her professors during her graduate studies. These academic interactions appeared to play a positive role in the students' integration and persistence. The high level of involvement, socially and academically, of the students who graduated corresponds to theory and research indicating that social and academic integration is an important factor in student persistence (Pascarella and Terenzini, 1983).

On the other hand, social and academic participation in college life was markedly different for the two students who withdrew. Neither of these students participated in formal social activities or clubs. The student who was married, had a child, and commuted had difficulty relating to her classmates. She felt her situation was so different from her fellow students and did not feel a connection to them. She also had difficulty connecting with instructors in large classes. The other student who withdrew had developed a social network, but indicated some initial challenges in making friends. Over time, his regular class attendance also declined. The experience of these students corresponds to Tinto's

(1993) assertion that failure to integrate academically and socially is a threat to degree completion.

### **Environmental Pull Factors**

Outside influences encountered by the participants included work, family, and finances. Each of the students worked at some point during the college career. The students who lived on campus worked part-time on campus, while the student who commuted worked full-time elsewhere. Employment affected the students in different ways. One student was employed in an academic department related to her major and found her position rewarding. Another student worked in a computer lab, and was able to catch up on assignments during slow periods. For the student who commuted full-time, work infringed on both her studies and her time with her newborn baby. For this student, employment negatively affected her ability to succeed.

Family was a positive influence for most of students. The students all experienced family support in beginning their college education. One student's parents were alumni of the institution and were very supportive of her education. Another student's parents strongly encouraged him to attend college. Although the student who commuted had a difficult time balancing academics, family, and work, she did receive support from her husband and mother.

The family became a negative influence for one student. This student came from a more sheltered background and experienced a decrease in her family's overall supportiveness. While her parents strongly valued higher education, they did not support her internal questioning and personal changes. For this student, family was a source of stress during her later years in college.



Outside factors seemed to have a particularly negative influence on the two students who withdrew. One student withdrew during this third semester because of financial reasons. The other student, who commuted, withdrew because of outside comments, such as new motherhood and work. Both financial challenges and living and working off campus were cited by Nora et al. (2005) as factors that “pulled” students away from college. The factors mentioned by these two students also follow closely with Tinto’s (1993) assertion that external influences from work or family can literally “pull” a student away from college attendance.

While the students who withdrew cited explicit reasons for their departure, implicit factors were also present. Both students, in various ways, failed to integrate academically and socially into college. One student failed to keep up consistent class attendance and indicated minimal commitment to graduating. The other student did not establish any social or personal connections with classmates or professors. This student felt that large class sizes impeded her learning but did not seek out institutional resources. The experience of these two students strongly relates to Pascarella and Terenzini’s (1983) concept of “person-environment fit” (p. 225). They concluded that a student’s persistence or withdrawal is largely influenced by their “fit” with the college environment over time.

While the two students who withdrew did not withstand the stress and challenges of college, the students who persisted did so despite their own challenges. One student in particular encountered family turmoil as she struggled to develop her identity. She met this struggle head on and took advantage of it as an opportunity to grow. According to Tinto (1993) all students encounter challenges, stress, and feelings of loneliness during the

transition to college, but it is not necessarily these challenges themselves that are the cause of withdrawal. Rather it is the individual's tolerance of the stress.

### **Limitations**

The results of this study were limited to the experiences of undergraduate students who were homeschooled in high school and then enrolled at a doctoral-granting, public, midsized, Midwestern, predominately White university. The study did not seek out students from private colleges or universities or from other geographical areas. The experiences of these students were self-reported.

### **Recommendations**

There are several modifications that could be made to the study's design. Conducting this study at a private college or a large research university would provide additional data. For more depth, interviews could be conducted with parents, siblings, roommates, professors, or resident assistants who have interaction with the students in order to obtain more observations on their college experiences.

### **Conclusion**

The authors' intent in this study was to explore the undergraduate experiences of college students that were homeschooled in high school. We found that this subpopulation, as all subpopulations of college students, has somewhat unique issues to contend with, due to their homeschooled background. However, these issues were not prohibitive of their college success. We found that they experienced college in many of the same ways that other, non-homeschooled students, did. In most regards, their undergraduate experiences were unidentifiable from the overall student population: they were normal college students.

## References

- Bolle, M., Wessel, R. D., & Mulvihill, T. M. (2007). Transitional experiences of first-year college students who were homeschooled. *Journal of College Student Development, 48*, 637-654.
- Bielick, S. (2008). *1.5 million homeschooled students in the United States in 2007* (NCES 2009-030). Washington, DC: National Center for Education Statics, Institute of Education Sciences, U.S. Department of Education.
- Bielick, S., Chandler, K., & Broughman, S. P. (2001). *Homeschooling in the United States: 1999* (NCES 2001-033). Washington, DC: National Center for Education Statistics, U.S. Department of Education.
- Bogdan, R. C., & Biklen, S. K. (1982). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn and Bacon.
- Cox, R. (2003). Home schooling debate. *The CQ Researcher Online, 13*, 25-48.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.
- Holder, M. A. (2001). Academic achievement and socialization of college students who were home schooled. *Dissertation Abstracts International, 62*(10), 3311A. (UMI No. 3029894)
- Lattibeaudiere, V. H. (2000). An exploratory study of the transition and adjustment of former home schooled students to college life. *Dissertation Abstracts International, 61*(06), 2211A. (UMI No. 9973466)
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Lofland, J., & Lofland, L. H. (1984). *Analyzing social settings*. Belmont, CA: Wadsworth.
- Luebke, R. V. (1999). Homeschooling in Wisconsin: A review of current issues and trends. *Wisconsin Policy Research Report, 12*, 1-29.

- Nightingale, D. & Cromby, J. (Eds.) (1999). *Social constructionist psychology*, Buckingham: Open University Press.
- Nora, A., Barlow, L., & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college. In A. Seidman, (Ed.), *College student retention: Formula for success* (pp. 129-153). Westport, CT: Praeger.
- Pascarella, E. T., & Terenzini, P. (1980). Predicting freshmen persistence and voluntary dropout decision from a theoretical model. *Journal of Higher Education*, 51, 60-75.
- Pascarella, E. T., & Terenzini, P. T. (1983). Predicting voluntary freshman year persistence/withdrawal behavior in a residential university: A path analytic validation of Tinto's model. *Journal of Educational Psychology*, 75, 215-226.
- Princiotta, D., Bielick, S., & Chapman, C. (2004). *1.1 million homeschooled students in the United States in 2003* (NCES 2004-115). Washington, DC: National Center for Educational Statistics, Institute of Education Sciences, U.S. Department of Education.
- Strauss, A., & Corbin, J. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage.
- Sutton, J. P., & Galloway, R. S. (2000). College success of students from three high school settings. *Journal of Research and Development in Education*, 33, 137-146.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45, 89-125.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2<sup>nd</sup> ed.). Chicago: University of Chicago Press.
- Van Gennep, A. (1960). *The rites of passage* (M. Vizedon & G. Caffee, Trans.). Chicago: University of Chicago. (Original work published in 1909)



## The Effect of Mandatory Reading Logs on Children's Motivation to Read

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### Abstract

Reading logs have become a practice in many elementary schools. Although lack of autonomy undermines intrinsic motivation (Lepper, Greene, & Nisbett, 1973), no study has examined the effect of logs. Second and third-grade students ( $N=112$ ) were assigned either a mandatory or voluntary log and surveyed about their motivation to read at baseline and after two months. Students with mandatory logs expressed declines in both interest and attitudes towards recreational reading in comparison to peers with voluntary logs, and attitudes towards academic reading decreased significantly from pre to post test across conditions. Future research should explore alternate ways to promote reading.

Keywords: reading, motivation, reading logs

Reading plays a crucial role in developing the foundation for future educational success, yet the amount of time spent reading is steadily declining among students throughout the United States (NEA, 2007). Time spent reading is strongly correlated with a number of personal and social benefits including academic success, higher average salaries, and positive community involvement (NEA, 2007), underscoring the need for educators find a way to reverse the trend toward less reading.

Reading logs are designed to encourage reading by assigning daily reading homework for a minimum number of minutes and are popular in many elementary schools. Although research has shown that diminished autonomy, defined as the ability to choose one's own actions, undermines intrinsic motivation (Ryan & Deci, 2000), no research thus far has investigated how mandatory reading assignments, like reading logs, affect children's intrinsic motivation to read. In an effort to fill this gap, the current experiment examined the effect of mandatory reading logs on children's motivation to read.

Well-meaning school officials expect that reading logs will increase the amount of time students spend reading. Parents are typically asked to remind their children to do their reading and to sign their logs each night. The long term effect of reading logs may, however, be a decline in student motivation to read, and the logs ultimately may lead students to spend less time reading. Research has established that there are two distinct kinds of motivation, intrinsic and extrinsic. Individuals are intrinsically motivated when they pursue an activity as an end in itself, without external motivators (Ryan & Deci, 2000). Considerable research evidence shows that the introduction of external controls such as assigned goals, evaluation, deadlines, and surveillance can undermine intrinsic motivation (e.g., Deci, Koestner, & Ryan, 1999; Deci, Koestner, & Ryan, 2001; Deci & Ryan, 1985). Moreover, the undermining of intrinsic motivation is associated with serious costs, including showing less interest in and having more negative attitudes towards the activity, producing lower-quality work, and being less creative (e.g., Cordova & Lepper, 1996; Deci, Koestner, & Ryan, 1999; Ryan & Deci, 2000).

With regard to reading, studies have shown that individuals who are not intrinsically motivated read for shorter periods of time and are less likely to choose reading as a recreational activity than extrinsically motivated readers (e.g., Baker & Wigfield, 1999; Paris & Oka, 1986;

Wigfield & Guthrie, 1997). Research has found that positive attitudes towards reading are the strongest correlate of reported time spent on recreational reading (Allen, Cipielewski, & Stanovich, 1992; Greaney & Hegarty, 1987; Scales & Glenn, 1984) and therefore can serve as an estimate of time spent in the activity.

Recognizing the benefits of intrinsic motivation, researchers have focused on the conditions under which individuals become intrinsically motivated. Bem's self-perception theory (1967) states that individuals attribute the motivations of their actions based on observations of their own behavior. Thus, if rewards are not made salient, children will not attribute their behavior as being extrinsically motivated (Hunter & Barker, 1987). The motivational implications of self-perception theory are reflected in Deci and Ryan's (1985) cognitive evaluation theory (CET), which contends that individuals require a sense of competence and autonomy to be intrinsically motivated.

An individual's sense of autonomy, defined as the ability to choose one's own actions, is an especially important determinant of intrinsic motivation (Ryan & Deci, 2000). Rewards, surveillance, pressure, control, and deadlines have all been shown to decrease intrinsic motivation (e.g., Amabile, DeJong, & Lepper, 1976; Deci & Cascio, 1972; Plant & Deci, 1985; Plant & Ryan, 1985). A more recent meta-analysis of the use of tangible and verbal rewards concluded that children appear to be particularly sensitive not just to rewards, but to an array of controlling tactics, such as imposed goals, deadlines, and surveillance, and that this result is especially true for children of elementary age (Deci, et al., 1999). However, unexpected rewards have been found slightly to increase intrinsic motivation in an activity (Deci, Koestner, & Ryan, 2001; Lepper, Green, & Nisbett, 1973). A meta-analysis of 128 studies showed that although tangible rewards decreased intrinsic motivation for an activity, certain types of external rewards,



like praise, were less damaging and could even have positive effects on intrinsic motivation (Cameron, 2001). A review of praise literature found that when given in a manner that promotes effort, competence, autonomy, and is informative rather than controlling, praise can significantly enhance motivation (Henderlong & Lepper, 2002). While external motivators may have a positive impact on intrinsic motivation, it is possible that the introduction of nightly reading logs may not be interpreted as a helpful form of structure but instead as a controlling manipulation.

Despite their popularity, there has been no research conducted on the effects of reading logs on children's motivation to read. It is possible that these types of mandatory reading assignments may undermine children's motivation to read because of their inherently controlling nature. When forced to read for a minimum number of minutes each night, children may feel that reading is an externally imposed activity, rather than something they choose of their own volition.

The present experiment investigated this question by testing the effect of reading logs on students' interest in and attitude toward reading. It was hypothesized that, compared to children given voluntary reading logs, children assigned mandatory reading logs would report: 1) less interest in reading, 2) more negative attitudes towards academic reading, and 3) more negative attitudes towards recreational reading.

## Method

### *Recruitment*

Second and third grade teachers in a suburban school district were approached in the spring preceding the study. The researcher explained the rationale behind the study, described the procedure, and answered questions. In total, 14 teachers agreed to participate in the study,

and each class was randomly assigned to be either in the mandatory or voluntary reading log condition.

Student participants were recruited at the beginning of the next school year. Students were told that the purpose of the study was to examine children's attitudes towards reading. Students were then given an informational packet to take home and read with their parents. The packet consisted of a letter from the school principal endorsing the study, a letter describing the study, and a consent form for both the parent and child.

### *Participants*

The sample for this study consisted of 112 2<sup>nd</sup> and 3<sup>rd</sup> grade students ranging in age from 6 to 8. Seventy students (63%) were in the 3<sup>rd</sup> grade, and 42 students (37%) were in the 2<sup>nd</sup> grade. Students were randomly assigned by class to either the voluntary reading log or mandatory reading log condition. Fifty-seven students (52%) were in the voluntary reading log condition, and 55 students (48%) were in the mandatory reading log condition. No additional demographic information was collected from participants in order to protect their privacy

### *procedure*

Teachers in the mandatory reading log condition assigned their students to read at least 20 minutes each night (but students were free to read more if they so wished) and required them to record their reading in a log with a parent signature after each entry. In the voluntary condition, teachers encouraged students to read and distributed logs but emphasized that it was an optional activity.

Participants took a survey both at the start and at the close of the study to see if attitudes and/or interest in reading changed. Two measures were used to measure intrinsic motivation. The attitudes component was drawn from the Elementary Reading Attitudes Survey (ERAS)

(McKenna & Kear, 1990) a 20-item survey that consists of two subscales: recreational and academic reading. Research has found that the recreational reading attitudes subscale of ERAS is strongly correlated with time spent reading as recorded in the daily activity diary of participants (Allen, Cipielewski, & Stanovich, 1992). Kids too young for accurate diary?

Each scale of ERAS consists of 10 items, and the survey has been found to be highly reliable across a large population (McKenna, Kear, & Ellsworth, 1995). Permission to use and adapt the survey was obtained from the creators. After discussion with teachers at both elementary schools, the academic reading subscale was modified to match the needs of this particular population, and 3 items were removed. One item referred to the use of a dictionary in class, which teachers in the 2<sup>nd</sup> and 3<sup>rd</sup> grades in neither school used. The second item referred to workbook pages and worksheets, which were also not used by teachers in the 2<sup>nd</sup> and 3<sup>rd</sup> grades. Finally, an item referring to “learning from a book” was removed because reading teachers believed that young students would not be able to understand the question. In addition, at the suggestion of teachers, one item was changed so that it read, “How do you feel about taking reading assessments” rather than “reading tests?”

Both attitude scales were answered on a 4-point scale, with each point depicted by a different image of Garfield. The leftmost image of Garfield (smiling Garfield) indicated strong agreement with the statement, while the rightmost image of Garfield (angry Garfield) indicated that strong disagreement with the statement. A Cronbach’s alpha revealed that students’ responses on the recreational reading subscale had a high reliability of .80 in the pretest, and a sample item from the recreational reading subscale was, “How do you feel about spending free time reading a book?” Student responses to the academic reading subscale also had a high

reliability of .81 in the pretest, and a sample item from the Academic Reading scale was, “How do you feel when you read aloud in class?”

The Reading Interest Scale is a 6-item scale adapted from the 7-item Interest Scale of the Intrinsic Motivation Inventory (Ryan, 1982). One item was removed (“This activity did not hold my attention at all”) because the elementary teachers believed that the item would be difficult for 2<sup>nd</sup> and 3<sup>rd</sup> graders to answer. A sample item read, “I enjoy reading very much.” The word “reading” replaced the general term “activity” to make it specific to this study’s question – that’s true on all the items?. Finally, the scale was answered on a 4-point Likert-type scale, but it was adapted so that instead of numbers, students saw the pictures of Garfield used in ERAS. A reverse-scored item was rephrased from “I thought this was a boring activity” to “I think reading is boring” because teachers believed the original item may have been confusing for 2<sup>nd</sup> and 3<sup>rd</sup> graders to answer. A Cronbach’s alpha revealed that student responses to the Interest Scale had a high reliability of .79 in the pre test.

Because all students may not have had achieved the fluency necessary to complete the survey independently, each item was aloud while administering the survey. Before survey administration, the Garfield scale was explained to the students. Participants were told that the survey would gauge how they felt about reading. It was emphasized that the survey was not a test and there were no “right answers”. Students required approximately 20 minutes to complete the survey.

## Results

### *Data Analysis*

Students’ responses on the Recreational Reading subscale of the ERAS, the Academic Reading subscale of the ERAS, and the Reading Interest scale were averaged separately to obtain

a score for each scale. Repeated-measures ANOVAs were used to examine hypothesized differences between groups in attitudes and interest. In all tests, an alpha value of .05 was used as the cutoff for statistical significance. Preliminary analyses showed there was no effect for grade that approached significance ( $p > .10$ ), so this variable was not included in the main analyses.

### *The Effect of Mandatory Reading Logs on General Interest in Reading*

A two-way ANOVA was performed with Condition (assigned/voluntary) as a between-subjects factor and Time (pretest/posttest) as a repeated measure. A significant interaction was found between interest in reading and condition,  $F(1, 112) = 8.38, p < .05, \eta^2_p = .07$ . As depicted in Figure 1, students assigned mandatory reading logs experienced a decrease in interest in reading ( $M=3.06$  to  $M=2.89$ ), while students given voluntary reading logs experienced an increase in interest in reading ( $M=3.08$  to  $M=3.29$ ).

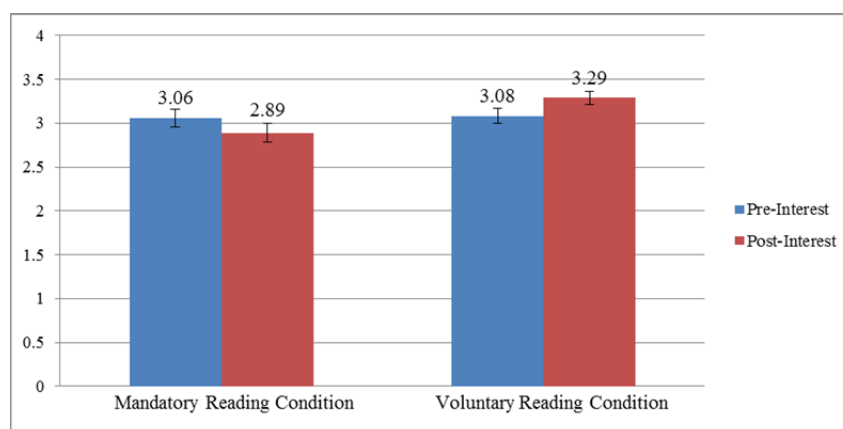
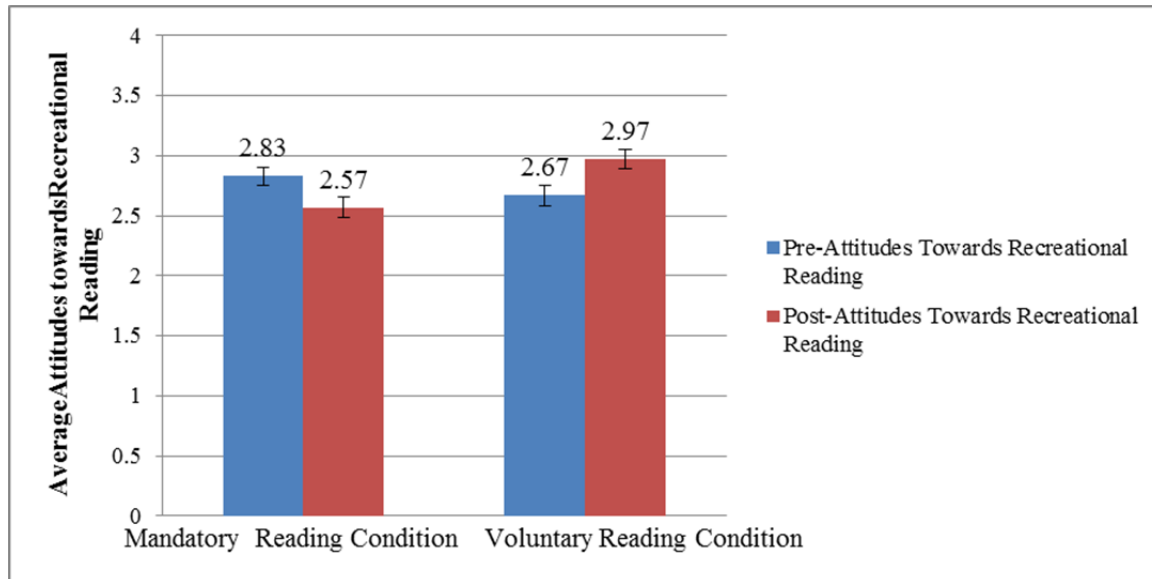


Figure 1. The interaction between pre and post test and interest in reading

### *The Effect of Mandatory Reading Logs on Attitudes towards Recreational Reading*

Another repeated-measures ANOVA revealed that there was a significant interaction between attitudes toward recreational reading and condition,  $F(1, 112) = 22.64, p < .001, \eta^2_p =$

.17. Figure 2 shows that students assigned mandatory reading logs experienced a decrease in attitudes toward recreation reading ( $M=2.83$  to  $M=2.57$ ), while students given voluntary reading logs experienced an increase in interest ( $M=2.67$  to  $M=2.97$ ).



### *The Effect of Mandatory Reading Logs on Attitudes towards Academic Reading*

No significant interaction was found between attitudes toward academic reading and condition,  $F(1, 125) = 0.33$ ,  $p = .57$ ,  $\eta^2_p = .003$ . However, there was a significant difference between pre and post-tests overall,  $F(1, 125) = 1298.76$ ,  $p < .001$ ,  $\eta^2_p = .91$ , as depicted below in Figure 3. Students assigned mandatory reading logs experienced a decrease in attitudes towards reading ( $M=3.50$ ,  $M=2.86$ ), as did students given voluntary reading logs ( $M=3.45$ ,  $M=2.79$ ).

## Discussion

### *The Impact of Mandatory Reading Logs on Interest in Reading*

As hypothesized, there was an interaction between pre and post test scores and condition on interest in reading; students who were assigned mandatory reading logs reported a decrease in interest, while students who were given voluntary reading logs reported an increase in interest.

The mandatory reading log, with its minimum requirement of 20 minutes of reading, may have undermined children's sense of autonomy and subsequently reduced their interest in reading in the same fashion that reduction in autonomy – in the form of deadlines, surveillances, and threats – have been shown to lead to decreases in task interest (Amabile, et al., 1976; Deci & Cascio, 1972; Plant & Deci, 1985).

*The Impact of Mandatory Reading Logs on Attitudes Towards Recreational Reading*

The study revealed a similar interaction between pre and post test and condition on attitudes towards recreational reading. At the end of the study, students in the mandatory log condition reported more negative attitudes toward recreational reading while the students who were simply encouraged to read reported more positive attitudes. Although there have not yet been previous studies on the topic of mandatory reading assignments, studies on surveillance, pressure, control, and deadlines have all shown that a decrease in autonomy leads to more negative attitudes towards the activity (Amabile, et al., 1976; Deci & Cascio, 1972; Plant & Deci, 1985). As suggested by self-perception theory (Bem, 1967), when reading is portrayed as something one has to be forced to do, students may draw the conclusion that it is not the kind of activity they want to engage in when given free time.

*The Impact of Mandatory Reading Logs on Attitudes Towards Academic Reading*

Contrary to the hypothesis, students in both conditions expressed more negative attitudes towards academic reading from pre to post-test. Attitudes towards academic reading is a measure of children's attitudes toward reading to learn, or, in other words, using reading as a tool by which to obtain new information. It is possible that students may have come to feel more negatively about academic reading over the two-month period of the study, as there is typically little opportunity for autonomy within academic reading. Often, the entire class reads the same

material (e.g., a textbook). Because students' ability to choose may have been circumscribed within academic reading in both conditions, it is possible that a lack of autonomy led to a decline in attitudes towards reading across both conditions. That students may find reading in school to be un motivating is a troubling finding in that externally motivated individuals often display less creativity, interest, and enjoyment in a task than internally motivated individuals (Deci, et al., 1999). Most importantly, externally motivated individuals do not pursue the activity of their own accord after external motivators are removed (Ryan & Deci, 2000; Deci, Koestner, & Ryan, 2001).

### *Conclusion*

To explore the possibility that lack of choice is responsible for the decline in interest and attitudes towards in academic reading, it would be useful to test the effect of giving students more choice when reading to learn. In addition, a longitudinal study would enable researchers to see if the decline in children's attitudes towards academic reading continues throughout the entire year and as they enter middle and high school.

It is worth noting that the experimental manipulation only lasted two months. Many schools use reading logs with students over many successive years. While it is possible that the negative effects of such practices become less pronounced over time, it is also possible that they are additive, ultimately leading some students to reject reading altogether. School officials and researchers need to partner to explore these issues more thoroughly and over a longer time period.

The importance of reading is virtually undeniable, and yet, motivating children to read has been a struggle for many educators and parents. Unfortunately, the results of this study suggest that resorting to methods like mandatory reading assignments such as reading logs are



ineffective ways of fostering a love of reading and may even lead to a decrease in children's motivation to read. To stem the tide of the declining time spent reading, educators should explore the possibility of crafting assignments that enable students to be more autonomous readers.

## References

- Allen, L., Cipielewski, J., & Stanovich, K.E. (1992). Multiple indicators of children's reading habits and attitudes: Construct validity and cognitive correlates. *Journal of Educational Psychology*, 84(4), 489-503.
- Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of Externally-Imposed Deadlines on Subsequent Intrinsic Motivation. *Journal of Personality and Social Psychology*, 34(1), 92-98.
- Baker, L., & Wigfield, A. (1999). Dimensions of children's motivation for reading and their relations to reading activity and reading achievement. *Reading Research Quarterly*, 34(1), 452-477.
- Bem, D. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74(1), 183-200.
- Cameron, J. (2001). Negative effects of reward on intrinsic motivation – A limited phenomenon: comment on Deci, Koestner, and Ryan. *Review of Educational Research*, 71(1), 29-42.
- Cordova, D., & Lepper, M.R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology*, 88(4), 715-730.
- Deci, E. L., & Cascio, W. F. (1972). Changes in intrinsic motivation as a function of negative feedback and threats. Presented at the Eastern Psychological Association Meeting (1972, April 19).
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). *A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin*, 125, 627-668.

- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research*, 71(1), 1-27.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Publishing Co.
- Greaney, V., & Hegarty, M. (1987). Correlates of leisure-time reading. *Journal of Research in Reading*, 10(1), 3-20.
- Hunter, M., & Barker, G. (1987). If at first...: Attribution theory in the classroom. *Educational Leadership*, 45(20), 50-53.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic rewards: A test of the overjustification hypothesis. *Journal of Personality & Social Psychology*, 28, 129-137.
- Paris, S. G., & Oka, E. R. (1986). Children's reading strategies, metacognition, and motivation. *Developmental Review*, 6(1), 25-56.
- Plant, R. W., & Ryan, R. M. (1985). Intrinsic motivation and the effects of self-consciousness, self-awareness, and ego-involvement: An investigation of internally-controlling styles. *Journal of Personality*, 53, 435-449.
- National Endowment for the Arts, (2007, November 19). To read or not to read: A question of national consequence. Retrieved September 2, 2009, from the National Endowment for the Arts website: <http://www.nea.gov/news/news07/TRNR.html>
- Ryan, R.M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43(1), 450-461.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.

- Ryan, R.M., & Deci, E.L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.
- Scales, A.M., & Glenn, L. J. (1984). A comparative analysis of reading attitudes elderly active and inactive readers. *Educational Gerontology*, 10(6), 459-467.
- Wigfield, A., & Guthrie, J. T. (1997). Relations of Children's Motivation for Reading to the Amount and Breadth of Their Reading, *Journal of Educational Psychology*, 89(3), 420-32.

## **Making Teacher Change Visible: Developing an Action Research Protocol for Elementary Mathematics Instruction**

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### **Abstract**

Professional development is a well-established component of teacher change, and action research can make that change visible. In this study, quantitative and qualitative data were collected from 237 elementary teachers and intervention specialists from 33 federally-designated Appalachian counties of Southeastern Ohio who participated in the year-long Better Mathematics through Literacy (BMTL) professional development experience. Using an ongoing, recursive, and emergent approach, the researchers identify changes in teachers' pedagogical approaches related to teaching early childhood mathematics. Three predominant themes emerged: Through the BMTL experience, the early childhood teacher-participants became more integrated, more contextual, and more constructivist in their mathematics instruction.

### **Introduction**

Over the past decades, mathematics educators and our educational partners have engaged in an on-going conversation about the critical importance of teaching and learning mathematics with understanding, especially within the early grades of school (National Council of Teachers of Mathematics [NCTM], 2001; National Research Council [NRC], 2001). From a student perspective, these formal learning experiences set the tone and expectations in the mind of young children for what it means to know and to do

mathematics. Standards documents from professional organizations, specialized reports from national-level commissions and advisory panels, and experts in our field have challenged mathematics educators and educational leaders to critically examine how teachers and students come to view, to know, and to understand the mathematics they are expected to learn and to teach (NCTM 2007; National Mathematics Advisory Panel [NMAP] 2008).

These advocates of reform in the approach to mathematics education at all grade levels consistently advocate for using problem-based, constructivist approaches to mathematics encouraging the formulation of ideas and concepts through discovery and inquiry and the use of classroom discourse and reasoning to communicate mathematical thinking and sense-making. Yet, daily, within the tens of thousands of early childhood and elementary classrooms throughout the United States, a large majority of teachers do not have conceptual understandings of the mathematics they teach to effectively support and structure the pedagogical strategies advocated within these reform documents (Ball, Hill, & Bass, 2005; Ma, 1999). Further, many inservice teachers working with young children feel they lack the pedagogical skills to successfully implement mathematics instruction that falls outside the predominant tell-show-do framework. Thus, many teachers challenged with establishing a well-connected and conceptual foundation for learning mathematics in the minds of young children that is predicated on purposeful problem-solving, reasoning, integrating mathematical ideas, and communication often default to a teacher-centered approach that relies heavily on the memorization of isolated facts, the repeated implementation of canned algorithms that have no inherent meaning, and mathematics

classrooms that function within a framework of sanctioned silence (Boaler, 2008; Van de Walle&Lovin, 2008).

To implement the vision of meaningful mathematics in the first years of schooling within a small section of Appalachia, the Better Mathematics through Literacy (BMTL) project has been designed as a one-year professional development experience for inservice early childhood teachers and intervention specialists. The main goals of the project are to strengthen teachers' conceptual mathematical content knowledge and to examine holistic approaches to mathematics through engaging, learner-centered activities, structured classroom discourse, the infusion of the NCTM Process Standards (2001), and the literary devices of writing, reading, and communicating (Burns, 1995; Kenney, 2005; O'Connell, 2005; Storeygard, 2009). The designers of this professional development experience anticipated that BMTL would be a conduit for teacher change and used the teacher-participants' engagement in the action research process to track this change. The purpose of this paper is to investigate how the action research component of BMTL structured and supported the teacher-participants' reflection about their mathematics instruction and how this manifest itself in their teaching of elementary mathematics.

### **Teacher Change, Professional Development, and Action Research**

The literature surrounding the process of teacher change indicates that it is anything but linear and self-contained. Change might be "prompted, promoted, or supported by discussions with other teachers... a workshop experience, frustration resulting from an often-tried activity that no longer works, an article in a practitioner or research journal, or a new grade level or population of students" (Richardson &Placier 2001, p. 908). Teaching behaviors can be redirected by setting goals that lead to new

behaviors. Setting explicit goals to effect change can impact teacher decision-making that is enmeshed in a way that honors the numerous interdependent interactions that constitute the highly complex environments of schools (Carlson, Dinmeyer, & Johnson, 2006). The most effective professional development for teachers typically occurs through active and engaged participation in communities of practice where individual members can shape what they are learning and what they can do with it (Gilrane, Roberts, & Russell, 2008).

Strategies for teacher change also include the use of structures that support job-embedded inquiry and professional interaction. These approaches recognize that teacher learning should (a) be centered around the critical activities of teaching and learning, (b) investigate practice through questioning, analysis, and criticism, and (c) be built on substantial discussions that foster analysis and communication (e.g. Darling-Hammond, 1999; Putnam, & Borko, 2000; Boyle, Lampianou, & Boyle, 2005). Each of these approaches is a response to the situated, social, and context specific nature of teacher change which can be scaffolded and supported through the action research process. Allowing these interactions to occur over time, particularly in a context supported by professional development, such as BMTL, enables teachers to practice and reflect on their teaching as it occurs within the context of their individual classrooms.

In his original work on reflection, John Dewey (1933) noted that much of teachers' work is uncertain and requires deep and foundational reflective practices. Further, he also suggested that the process of reflection begins when a teacher experiences a difficult or unexpected problem in the classroom (Dewey, 1933). Action research, as defined and implemented within the BMTL experience, engages teachers in this kind of reflective thinking that is necessary to identify and address problems in the classroom and ways to



improve teaching and learning. In this process, having identified an area where student learning could be improved, the teacher steps back to analyze the situation (Windschitl, 2002). When done systematically, this approach may lead to new solutions and greater professional expertise (Eraut, 2000; Wang & Odell, 2002).

Reflection is an integral component of action research and has been characterized differently by a wide variety of authors, yet most are essentially similar. For example, Marcos, Sanchez, and Tillema(2008) describe reflection in four steps: identifying a problem, making a plan for change, experimentation, and reviewing the plan. Korthagen and Vasalos (2005) conceptualize reflection in similar although slightly different way. They view reflection as starting with an action, looking back on the action, becoming aware of essential aspects, creating alternative methods of action, and engaging in a trial. A key similarity in both of the processes described above is the recursive nature of the reflective process. At their core, these two views of reflective thinking have elements of planning, acting, and reviewing what has happened. One difference between the two is that the first model began with a problem, and the second model began with an action.

Action research can take many different forms in that it occurs through the purposeful, personal, and reflective examination of teaching practice within individual classrooms. Yet, in its purest intent, action research provides teachers with opportunities to demonstrate what Schon (1983) calls “reflection-in-action” and “reflection-on-action” and what Darling-Hammond (2005) identifies as the cycle of teacher thinking that occurs during “enactment” and “reflection.” Action research also contains elements of what Cochran-Smith and Lytle (1999) call “knowledge-of-practice,” which they define as knowledge accrued from the systematic and purposeful reflection on teaching. The type of

thinking associated with teacher inquiry is employed after the act of teaching and requires teachers to be reflective, analytical, and to engage with thinking processes that are more deliberate, concerned with method, and associated with a systematic process (Korthagen&Vasalos, 2005). It is within the articulation of this enactment and reflection that action research can help make teacher change become more visible.

### **The Structure of Better Mathematics through Literacy**

Better Mathematics through Literacy (BMTL) was conceived and designed in a collaborative effort of university faculty in mathematics education, reading education, and early childhood education along with administrative and support staff from a university center for the study and development of literacy and language. Funding for the project was made available through a yearly competitive proposal review process sponsored by the Ohio Board of Regents Improving Teacher Quality Grants. In five consecutive years of implementation, the BMTL project has been awarded over \$700,000 to provide high-quality professional development, mathematics manipulatives, selections from children's literature, and professional resources in student-centered mathematics instruction. With an average of 47 teachers per yearly cohort, 237 inservice elementary teachers and intervention specialists representing thirty-three Appalachian Ohio counties and forty-five individual school districts have completed the professional development project.

The BMTL professional development experience consists of three stages. These include an intense, week-long Summer Institute, three follow-up sessions during the academic year, and a conference-style Action Research Final Symposium where the teacher-participants present the structure and findings of their own action research projects.

During each week-long Summer Institute, the BMTL cohorts are immersed and engaged within a mathematics learning community to explore student-centered mathematics instruction through two different perspectives. As students, the teacher-participants receive a first-hand experience of rich, open-ended mathematical tasks that span the elementary mathematics concepts of counting, number sense, operations, and algebraic thinking. These activities create a classroom atmosphere conducive to meaningful learning and naturalistic inquiry and are supported by children's literature that develop and expand mathematics concepts. As teachers, the workshop facilitators assist the teacher-participants in deconstructing the critical elements of the mathematical tasks and student-centered pedagogical strategies used in facilitating the tasks as well as the questioning strategies and interpersonal communication which are specifically designed to solicit the teacher-participants' mathematical thinking. Inevitably, the juxtaposition of the student-centered approach to mathematics instruction in BMTL and the teacher-directed approach occurring in most teacher-participants' classrooms creates a high level of cognitive dissonance for the teacher-participants. This unease, coupled with the expectation to enact and reflect upon their own implementation of similar tasks and strategies, sets the stage for action research during the school year.

In stage two, three follow-up sessions occur in September, December, and February of the academic year. Cohort groups meet simultaneously through distance learning technology as the researchers and teacher-participants explore additional, developmentally-appropriate mathematics concepts in probability, geometry and spatial sense, and measurement, respectively. These structured activities and discussions followed a similar format to the days of the Summer Institute, but specific conversations were

designed for teacher-participants to share the struggles and successes surrounding the implementation of student-centered mathematics in their classrooms as well as their reflection, questioning, and analysis surrounding their action research. A day-by-day summary of the mathematics concepts, the mathematics manipulatives, and children's literature used within the BMTL professional development program is given in Table 1. (See Appendix)

Stage Three of the BMTL professional development program, the Action Research Final Symposium was conceived as a public display and celebration of the teacher-participants' experience within the year-long professional development. Held in late April of each academic year, a conference-style format allowed each participant ten to fifteen minutes to present the focus of his or her action research project, any student work or data that supported the findings and conclusions, and the teacher-participant's summary of the impact of the BMTL experience on their teaching and learning of mathematics during the school year. Each presentation session was digitally recorded, and each participant was required to submit a written reflective summary of his or her action research experience and findings to the BMTL team.

### **Role of Action Research Protocol in Making Teacher Change Visible**

Having examined the interconnectivity of professional development, action research, and teacher change, this section addresses the BMTL Action Research Protocol, an instrument which served as a key vehicle for making teacher change visible within the year-long professional development. Now in its fifth year of implementation, BMTL has incorporated an action research component since the outset. Rather than severing all ties with the teacher-participants following the one-week Summer Institute, the BMTL team set the expectation of moving the participants

into action. That is, we wanted the elementary teacher and intervention specialists to implement and experiment with the student-centered approach to elementary mathematics and to document and reflect upon their experiences as the school year progressed.

In the first year, the action research project was admittedly problematic as it became evident to the project team that the teacher-participants were not clear on the expectations for the action research project or even what constituted action research. Based on their vociferous feedback, they were overwhelmed by what we were asking them to do, and most had a conception of “research” as an action far removed from their day-to-day life in elementary classrooms. The research team, seeing action research as a crucial opportunity for teachers to critically engage in the reflective examination their mathematics teaching in elementary schools but recognizing the teachers’ confusion and frustration over how to conduct such research, developed an Action Research Protocol (ARP) for use in all future iterations of the BMTL experience.

The ARP was a way of taking what was, to the teacher-participants, an overwhelming and seemingly insurmountable task and making it more systematic, manageable, and reflective. The ARP broke down the project into meaningful and accessible chunks that the teacher-participants were able to utilize in examining and reflecting upon their mathematics instruction. This instrument which appears as Table 2 (see appendix) gave a month-by-month guide to the participants in the form of guiding questions and open-ended personal reflection prompts throughout the school year. The participants were asked to draft their written responses to the ARP questions based on their experience and their interactions with students and to collect student work samples and other relevant data that would support their evolving thinking, tentative conclusions, and reflective responses. As the school year progressed, participants were

asked to submit their written protocol responses to the research team at each Follow-up Session, and a wedge of time at each Follow-up Session was also dedicated to group discussion and idea sharing centered on the successes and struggles of the action research project. The systematic and supportive structure of the ARP provided the researchers with data useful for tracing teachers' changes in pedagogical approaches to teaching elementary mathematics. The instrument also provided a framework for teacher-participants build success in the focus and development of their classroom-based research.

### **Discussion and Findings**

From the 237 elementary teachers and intervention specialists who completed all three stages of the BMTL professional development experience in the past five years, the researchers purposefully selected a subset of twelve teacher-participants from across all cohorts for in-depth analysis. Based on demographic and categorical data provided at registration, the subset represented an equivalent blend of grade-level teaching assignments and included two intervention specialists who work primarily with small groups of students within a resource room. This purposeful subset also ensured a representative sample in years of teaching experience, a balance in bachelors and masters degree holders, district-level mathematics curriculum, and geographic location within Appalachian Ohio. Gender was not used as selection criteria as only six of all BMTL participants have been male; the researchers felt that including a male in the sample may risk participant confidentiality.

From this purposeful sample of twelve, the average BMTL participant is a forty-one-year-old female with an average of thirteen years teaching experience in elementary settings. Most taught in self-contained classrooms of twenty to twenty-five students and used traditional, or teacher-directed, mathematics curricula. Ten of the twelve participants are Appalachian

natives teaching in school districts within twenty miles of the cities and towns in which they were raised.

Through their recursive, qualitative examination of the sample teachers' responses to the ARP and the transcriptions of their Action Research Projects, the two researchers were able to identify how the teacher-participants within the sample internalized the professional development from the Summer Institute, and further, how the action research was structured and implemented within their individual classrooms. All teachers within the purposeful sample articulated detailed evidence of student work and personal, reflective narratives of how their daily mathematics instructional time became less textbook-driven as a result of their new, investigative approach to mathematics. As evidenced by sample data in Table 3, three predominant themes of teacher change emerged through the data sets. The researchers assert that through the BMTL Professional Development program and through the deliberate self assessment and reflection structured by the Action Research Protocol, the elementary teachers and intervention specialists became more integrated, more contextual, and more constructivist toward mathematics instruction.

The three major findings are summarized in this section, and Table 3 highlights a brief sample of teacher voices that exemplify the findings. As readers view Table 3, they will see quotes from the teacher-participants' Action Research Protocols demonstrating a first-person perspective of the growth trajectory progressing from September to December to February and to the Final Symposium in late April where teachers presented their action research projects. Though it should be emphasized that each of the three themes in the findings was found in all twelve of the purposeful sample for this study, Table 3 highlights only one teacher for each of the three findings for the sake of brevity. It was the

decision of the authors to use Table 3 to exemplify the reflective thinking and seeds of positive change identified in the larger data corpus. (see appendix)

### **Teacher Pedagogical Change 1: BMTL Teacher-Participants became *More Integrated* in their Approach to Mathematics Instruction**

Throughout the academic year, the researchers noted that the participants began to view their mathematics instruction in a more integrated fashion. The Action Research Protocol (ARP) was the primary tool participants used to reflect on and assess their own teaching practices as well as their students' responses to new strategies they were implementing. Participant reflections in the ARP clearly indicated that as the teachers set the expectation that their students use writing, speaking, and communicating to articulate their developing mathematical thinking, students were ultimately able to make better understand mathematical concepts. Recurring examples in teacher responses to the ARP showed that students were making sense of the mathematics they were learning rather than memorizing a set of steps to carry out a procedure. As a result of BMTL, the participants were also introduced to children's literature and trade books that are centered on mathematical themes that can provide connective threads between their literacy and mathematics instruction. Sample evidence of this finding appears in Table 3, which features Allison, a third grade teacher. Along with the purposeful sample of 12 teachers, she was able to identify the powerful impact of using children's literature, writing, and communication to enhance her teaching of mathematics. As teachers reflected on their implementation of BMTL strategies through the ARP, they clearly noted the important role that integrating reading, writing, and verbal communication played in increased



mathematical understanding. What could also be observed through participant responses to the ARP is that as they noted students' increased ability to make sense of mathematical concepts, they were more inclined to continue the integrated approach, sometimes using children's literature in tandem with manipulatives and regularly providing students with opportunities to talk about how they were processing the mathematics.

**Teacher Pedagogical Change 2: BMTL Teacher-Participants became *More Contextual* in their Approach to Mathematics Instruction**

A second emergent theme identified by the researchers articulated a more contextual approach to the mathematics that, in years past, they had taught through more traditional means. Using strategies from BMTL, teachers shifted their teacher-centered demonstrations of procedures to instruction that involved more complex mathematical tasks and situations that became the basis for authentic problem solving connecting with students' daily lives. As a result of BMTL, rather than presenting mathematical concepts in isolation and stripped of any relevant context, teachers found increased engagement and interest from students by placing mathematical experiences within the context of their students' day-to-day experiences. Concepts central to building mathematical understanding were no longer artificially separated into chapters or workbook pages or artificially fragmented segments of the school day, but instead connected with students' prior knowledge. Strategically selected titles from children's literature were used as a conduit to understanding as students actively and excitedly used a wide range of solution strategies to make sense of addition and subtraction in a context. Sample evidence of this finding appears in Table 3, which features Kelly, a second grade teacher, and her success in bringing mathematics to life by removing it from the

confines of a textbook. Reflections through the ARP repeatedly demonstrated teachers' awareness of the benefit of linking mathematical concepts to real world contexts to which students could relate. This dovetailed naturally with the first finding that participants, upon implementing BMTL strategies, became more integrated in their approach to teaching mathematics. The value of hands-on activities and connecting mathematics with larger units of study, rather than teaching math in isolation or through a series of isolated worksheets, was a recurring theme in the participants' ARPs. Teachers noted that as they connected math with examples from real life and other subjects and employed more hands-on learning strategies, students were able to see how the pieces fit together and thus have a more holistic, meaningful experience with mathematics.

### **Teacher Pedagogical Change 3: BMTL Teacher-Participants became *More Constructivist* in the Approach to Mathematics Instruction**

Finally, as a result of having a first-hand learning experience in which mathematics concepts were presented in a student-centered manner within the BMTL Summer Institute participants were more willing to allow students to discover mathematical concepts and relationships in ways that made sense to the students. As the ARP asked teachers to think about what strategies they were using and how those strategies impacted student learning, they routinely reflected back on how as they provided opportunities for students to make mathematical observations and generalizations rather than constantly telling them what to do and how to think, student learning improved. Mathematics became an investigative and evolving construct in the minds of the students rather than a set of discrete facts and algorithms they were to memorize. Teachers regularly shared that their students were not only growing in their competence and confidence with mathematics, but also that they

were showing signs of increased engagement along the way. Sample evidence of this appears in Table 3, which features Sarah, a kindergarten teacher and her reflection on how students can actively construct mathematical understanding as a result of their increased engagement.

### **Conclusion**

The national conversation surrounding early childhood mathematics centers on how to strengthen classroom teachers' mathematical content knowledge and how to implement pedagogical changes that mirror the integrated, contextual, and constructivist approach supported by reform documents. Our research team feels that opportunities such as the Better Mathematics through Literacy professional development project, and in particular the Action Research Protocol, can provide meaningful learning opportunities to early childhood teachers and intervention specialists. The deliberate, practical, and reflective nature of action research provided the BMTL teacher-participants with a framework for examining their teaching and their students' learning and as a result changes their teaching to be more integrated, contextual, student-centered, and constructivist. While we feel that opportunities in early childhood development are plentiful, we want to emphasize that what makes BMTL different and profoundly impactful is the way that it establishes, through the Action Research Protocol, a clear expectation that teachers take what they are learning and put it to use in the classroom. Ultimately, the point of imbedding action research in this meaningful professional development experience is to guide teachers in a reflective examination of their pedagogical practices and, where necessary, lead to changes in mathematics instruction that mirror calls for national reform in mathematics.

## References

- Ball, D.L., Hill, H.C., & Bass, H. (2005, Fall). Knowing mathematics for teaching: Who knows mathematics well enough to teach third grade, and how can we decide? *American Educator*, 14-21.
- Boaler, J. (2008). *What's math go to do with it: How parents and teachers can help children learn to love their least favorite subject*. New York: Penguin.
- Boyle, B., Lampianou, I., & Boyle, T. (2005). A longitudinal study of teacher change: What makes professional development effective? Report of the second year of the study *Journal*, 16(1), 1-27.
- Burns, M. (1995). *Writing in math class: A resource for grades 2 – 8*. White Plains, NY: Math Solutions.
- Carlson, J., Dinkmeyer, D. Jr., & Johnson, E.J. (2008). Adlerian teacher consultation: Change teachers, change students! *The Journal of Individual Psychology*, 64(4), 480-493.
- Cochran-Smith, M., & Lytle, S.L. (1999). Relationships of knowledge and practice: Teacher learning in communities. *Review of Research in Education*, 24, 249-305.
- Darling-Hammond, L. (2005). Prepping our teachers for teaching as a profession. *Education Digest*, 71(4), 22-27.
- Darling-Hammond, L. (1999). Teacher learning that supports student learning. *Educational Leadership*, 55 (5) 6-11.

Dewey, J. (1933). *How we think*. New York: Heath.

Coffield (Ed). *The Necessity of Informal Learning*: Policy Press. Bristol

which everyone teaches, learns, and reads: A case study. *Journal of Educational Research*, 101(6), 333-349.

Kenney, J.M. (2005). *Literacy strategies for improving mathematics instruction*. Alexandria, VA: ASCD.

Korthagen, F. & Vasalos, A. (2005) Levels in reflections: Core reflection as a means to enhance professional growth. *Teachers and Teaching: Theory and Practice*, 11(1), 47-71.

Ma. L. (1999). *Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States*. Mahwah, NJ: Erlbaum.

Marcos, J.J.M., Sanchez, E., & Tillema, H. (2008). Teachers reflecting on their work: Articulating what is said about what is done. *Teachers & Teaching*, 14(2), 95-114.

National Council of Teachers of Mathematics. (2007). *Teaching mathematics today: Improving practice, Improving student learning!* Reston, VA: author.

National Council of Teachers of Mathematics. (2001). *Principles and standards of school mathematics*. Reston, VA: Author.

National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. Retrieved June 10,

- 2008 from <http://www2.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf>
- National Research Council. (2001). *Adding it up: Helping children learn mathematics*. Washington, D.C.: National Academy Press.
- O'Connell, S. (2005). *Now I get it: Strategies for building confident and competent mathematicians, K-6*. Portsmouth, NH: Heinemann.
- Putnam, R.T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher* (29)1, 4-15.
- Richardson, V., & Placier, P. (2001). Teacher change. In V. Richardson (Ed.), *Handbook of research on teaching* (4<sup>th</sup> ed., pp. 905-947). Washington: American Educational Research Association.
- Schon, D. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic.
- Storeygard, J. (Ed.). (2009). *My kids can: Making math accessible to All learners, K-5*. Portsmouth, NH: Heinemann.
- Van de Walle, J.A. & Lovin, L.H. (2006). *Teaching student-centered mathematics: Grades K-3*. Boston, MA: Pearson.
- Wang J., & Odell, S.J. (2002). Mentored learning to teach and standards-based teaching reform: A critical review. *Review of Educational Research*, 72(3), pp. 481-586.
- Windschitl, M. (2002) Framing constructivism as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research*, 72(2), 131-175.

## Appendix

Table 1:

## Structure of Better Mathematics through Literacy

BMTL Session	Mathematics Focus	Literacy Focus	Mathematics Manipulatives	Children's Literature Selections
<b>Stage One: Summer Institute</b>				
Day One	Rich Mathematical Tasks Student-Centered mathematics Building a Math Community	Using expository writing as a tool for Inquiry Reading Difficulties in Math	Color Tiles	<i>Math Curse</i> <i>Mrs. Spizter's Garden</i> <i>Hurray for Diffendoofer Day</i>
Day Two	Counting, Number Sense, Bridges from Counting to Addition NCTM Process Standards	Counting Books Syllable Classification Before, During, and After Readings Classroom Publishing and Book Making	Base Ten Blocks Dominoes Ten Frames Twenty Frames Digit Cards	<i>Ten Black Dots</i> <i>12 Ways to Get 11</i> <i>Rooster's Off to See the World</i> <i>One Duck Stuck</i> <i>The Grapes of Math</i> <i>One is a Snail, Ten is a Crab</i> <i>Each Orange Has 8 Slices</i>
Day Three	Deconstructing the Four Basic Operations Using Context for Problem Solving Learning Theories in Mathematics Education Formative Assessment in Mathematics	Using Non-math texts as a context for mathematical activity Using the Writing Process for Refining Mathematical Tasks Consonants and Iconicity Short Vowels and Iconicity	Counters	<i>Mouse Count</i> <i>The Monster Who Did My Math</i> <i>Not Norman, A Goldfish Story</i> <i>512 Ants on Sullivan Street</i> <i>The Doorbell Rang</i> <i>One Hundred Hungry Ants</i> <i>Commotion in the Ocean</i> <i>Amanda Bean's Amazing Dream</i>
Day Four	Fraction Concepts	Phonemes Morphemes	Fraction Circles Fraction Squares Fraction Overlays Cuisenaire Rods Tangrams Geoboards Pattern Blocks	<i>Five Creatures</i> <i>Apple Fractions</i> <i>Fraction Fun</i> <i>How Many Snails</i> <i>Pizza Counting</i> <i>Fraction Action</i>
Day Five	Patterns Developing Algebraic Thinking	Patterns in Poetry Creating stories from graphs	Attribute Blocks Snap Cubes	<i>Tiger Math</i> <i>Math for All Seasons</i> <i>Rabbits, Rabbits, Everywhere</i> <i>Where the Sidewalk Ends</i>



**Stage Two: Follow-Up Sessions**

September	Listing Outcomes Data Analysis Early Probability Concepts Likely / Unlikely	Integrated Teaching Units and Theme Days  Best Bets for Spelling	Spinners Number Cubes Two-color counters	<i>Probably Pistachio</i> <i>Fortunately</i> <i>Go Away! Big Green Monster</i>
December	Geometry and Spatial Sense Sorting and Classifying Symmetry	Handwriting and Spatial Sense  Connections from Manuscript to Cursive	MIRAs 3D Solids Sorting Circles Tangrams Pattern Blocks	<i>Snowflake Bentley</i> <i>The Greedy Triangle</i> <i>Grandfather Tang's Story</i>
February	Measurement Standard and Non-Standard Units of Measure Frames of Reference for Measurement	Prefixes and Suffixes  Measurement Poems  Class Books	Judy Clocks Measuring Cups Measuring Spoons The Master Ruler Stopwatches Sand Timers Protractors	<i>Great Estimations</i> <i>How Big Is a Foot?</i> <i>Measuring Penny</i> <i>Inch by Inch</i> <i>Is a Blue Whale the Biggest Thing There Is?</i>

Table 2

## Action Research Protocol

Better Mathematics Through Literacy (BMTL) Action Research Project
Monthly Planning Document for 2009-2010
<p><b>August:</b> Think about what you've learned in the intensive July workshop. Figure out what BMTL strategies (ways of teaching) you will integrate into your curriculum in 2009-2010</p>
<p><b>September:</b> Be deliberate about what BMTL strategies (ways of teaching) you are using by keeping a journal. Besides being mindful to align your ways of teaching with Standards, be deliberate in examining the effect of your teaching (with BMTL) on student learning. The effect on student learning needs to be a continued and deliberate focus. The following questions may help structure your thinking in this regard:</p> <ol style="list-style-type: none"> <li>1. How am I teaching? (i.e. What strategies am I using?)</li> <li>2. What effect is the way I am teaching having on student learning?</li> <li>3. How do I know that the way I am teaching is working (or not working) to improve student learning?</li> <li>4. What sources of evidence will support the fact that the way I am teaching is having a positive effect on student learning? (Possible sources of evidence: student work, observations recorded in a journal, various forms of assessment, video tape or interview with students)</li> </ol>
<p><b>September 26<sup>th</sup>:</b> Bring answers to the above questions (preferably word processed). We will spend some time debriefing on what's happening in your classrooms and how BMTL strategies (ways of teaching) are impacting student learning. <i>Bring two copies of your written answers—one for yourself and one for us to keep.</i></p>
<p><b>October-November:</b> Consider our discussion from the first follow-up session (September 26<sup>th</sup>)—what you heard from others about what is and isn't working. Utilize feedback from others and continue to be deliberate about how the way you are teaching relates to what and how your students are learning. Because we will be moving through an actual school year you will be utilizing more strategies or ways of teaching (and repeating some strategies) as the year goes on. Keep track of what strategies (ways of teaching) you are adding and how the strategies you are repeating over time impact student learning. Besides the original four questions (above) the following questions should help structure your thinking and move toward the Action Research Project:</p> <ol style="list-style-type: none"> <li>1. What ways of teaching (strategies) have I used over a prolonged period of time?</li> <li>2. What difference do I see in my students' learning now that they have more practice with these strategies and ways of thinking and learning?</li> <li>3. What evidence do I have to support my conclusions in #2? (Here again, samples of student work, observations recorded in a journal, formal and informal assessments, video tapes of students working, and interviews with students would be excellent sources of evidence).</li> </ol>
<p><b>December 5<sup>th</sup>:</b> Bring your answers to the above questions <u>and some examples of student work</u> that will show some of what's going on in your classroom as a result of BMTL. We will take time to share and generate feedback. <i>Bring two copies of your written answers—one for yourself and one for us to keep.</i></p>
<p><b>January-February:</b> Continue the process of being deliberate about your teaching and your students' learning as you employ strategies (ways of teaching) from BMTL. Because each follow-up session will present new information (September = Geometry; December = Probability; February = Measurement), you should especially be mindful of strategies you are adding. For strategies you are continuing throughout the school year (for instance, if your students are keeping a math journal), your observations and supporting evidence of the effect on student learning over time are valuable. So besides the prior seven questions, you may want</p>

to ask the following:

1. Have I seen my students become more confident, comfortable, and capable with math because of the way I am teaching? Explain with some specific details which combine observation and supporting evidence.
2. Now that I'm 6 months into the school year and within three months of the Final Symposium for BMTL, what would I like to focus on in more depth? (i.e. What do I want to be the focus of my Action Research Project?)

**February 20<sup>th</sup>:** Bring answers to the above questions (optional) and the four questions listed below (required). *Bring two copies of your written answers—one for yourself and one for us to keep.* This is our last follow-up before the Final Symposium so you'll need to have a clear sense of direction on the specific aspect of BMTL and its effect on student learning that will be the topic of your Action Research Project. What we are looking for are the following:

- A clearly defined topic (a particular strategy or way of teaching) employed as a result of BMTL
- Conclusions about how the strategy/way of teaching affected student learning
- Evidence that supports your conclusions

The following questions will give shape to your Action Research Project:

1. What strategy (way of teaching) did I employ, and how was I deliberate in exploring the effects of this strategy or way of teaching on student learning? *You don't have to cover every strategy; focus on a particular strategy (way of teaching) or manageable combination of strategies.*
2. What was the effect of this strategy or way of teaching on student learning?
3. How do I know that this strategy or way of teaching impacted student learning in a given way? What evidence do I have to support my conclusions?
4. How can I share this research with others? (trifold, PowerPoint, essay of strategies and findings, video of students working, interviews with students, samples of student work, etc.)

**March-April:** Keep utilizing BMTL strategies (ways of teaching) and being deliberate about analyzing their effect on student learning. Formalize your Action Research Project for the Final Symposium, making sure to address the four questions from the February 20<sup>th</sup> follow-up session and the following:

How will what you learned this year through BMTL affect your future teaching?

- Continuing: What do you envision continuing?
- Improving: What changes do you plan to make to improve your implementation of BMTL strategies (ways of teaching) next school year?
- Expanding: What do you plan on expanding?

**April 24<sup>th</sup>: Final Symposium.** The two groups will meet together, and we will have some outside guests to include area teachers, principals, and representatives from the Ohio Department of Education and the Ohio Board of Regents.

The following guidelines will help you to anticipate the Final Symposium:

- Each presenter will have 10 minutes.
- We will videotape the presentations.

One Final Consideration: Attached is "Permission to Use Photos/Videos" for you to have the parents/guardians of your students sign in the event that you would like to incorporate pictures in your Action Research Project. If you have your own form that covers the same (or more generic) content that you've already secured for the year, that's fine too. *If you use this letter, make sure to personalize it with your school information in the signature portion of the letter mid page.*

## Evidence of Major Findings

BMTL Sample Teacher-Participant & Grade Level	Action Research Responses September	Action Research Responses December	Action Research Response February	Action Research Final Presentation Transcript
<i>Finding One: BMTL Teacher-participants became <b>more integrated</b> in their approach to mathematics instruction</i>				
Allison  Grade 3	"We no longer teach the math by chapters... we now have 90 minute blocks for math. We had been so engrossed with our Reading First priorities that math had been neglected." (Fall, response 1)	"We are continually reviewing and discussing various standards at the same time. We are also connecting the standards in math together in numerous ways throughout the school year." (Winter, response 2)	"During the summer when I was taking BMTL, I saw the importance of using literature with students because it would stick in their minds and help them to remember concepts... Little did I know how many [books with mathematical ties] I had or would find in bookstores now that I had seen the relevance of this process." (Spring, response 2)	"I feel that all of these improvements have made a difference with our students in math this year. They seem to understand the concepts and the skills much better than in recent years. With the third grade teachers team-teaching with the assistance of the intervention teacher, it has made a GIGANTIC difference in our children's lives." (Final Action Research Symposium Transcript)
<i>Finding Two: BMTL Teacher-participants became <b>more contextual</b> in their approach to mathematics instruction</i>				
Kelly  Grade 2	"I have noticed that the first week of using math journals, most of the students just drew pictures based on what they read. Now many are starting to write what we are doing. I had no ideas that placing their math problems in a context would make word problems so much easier! We talk about what we did in math and I put words on the board if they ask." (Fall, response 1)	"I introduced the idea of multiplication during the patterns we were doing recently and many were so enthralled with it that they continued to do patterns on their own with paper, cubes, and parquetry blocks. The mood in the room was infectious as the students explored with the tiling tasks." (Winter, response 3)	"I continued with the small group conversations, manipulatives and putting the math in the context of larger units that we were studying, and working together. I think this will be beneficial in measurement and exploration. I never thought that measurement would fit well with our social studies unit on continents. But, I'm hoping that the more hands-on activities with measurement and practical applications, the students will see the benefit of this genre of mathematics." (Spring, response 2)	"I have been teaching for over twenty years, and this year was my first focused effort to create integrated units that involve multiple subjects throughout the day. The problem solving that the students have done this year is a strong piece of evidence that has shown me that even second-graders can see the big picture, and they want to see how all of the pieces fit together." (Final Action Research Symposium Transcript)

<i>Finding Three: BMTL Teacher-participants became <b>more constructivist</b> in their approach to mathematics instruction</i>				
Sarah  Grade K	“By holding the bar higher this early in kindergarten, I am observing that the students are working at a higher level than I thought possible. The students have been able to cut apples into halves and fourths and been able to recognize and to cut out examples of two-dimensional shapes. This includes the special education IEP kids who are excelling and going beyond just the basics.” (Fall, response 3)	“I noticed that with the books we make, the students are actively engaged and seem to be retaining more of the information and concepts than students in the past. I never really thought it would work, but the less I tell them about how to complete a task, the more they collaborate and figure it out on their own!” (Winter, response 2)	“I have seen my higher level students soar beyond what I thought possible from a six year old child. So far, these students have been able to comprehend and apply concepts of probability, fractions, and even multiplication as repeated addition. I have seen a large portion of my special education students grasp differentiated forms of these same concepts.” (Spring, response 2)	“I believe that word of mouth in a small school district like mine is very valuable. I have discussed the strategies with many staff members at all grade levels, encouraging them to take this course to improve their mathematics thinking about the way we teach math concepts to our students. This approach to mathematics is beginning to catch on in all of our building grade levels.” (Final Action Research Symposium Transcript)

Academic identity status, goal orientation, and academic achievement  
among high school students

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### Abstract

The aim of the present study was to determine the relationship between academic identity status, goal orientations and academic achievement. 301 first year high school students completed the Academic Identity Measure and Goal Orientation Questionnaire. The average of 10 exam scores in the final semester was used as an index of academic achievement. Results showed that academic identity status and goal orientations are related to academic achievement. Diffuse academic identity, mastery-approach goal orientation, and foreclosed academic identity explained the greatest amount of variance in academic achievement. Boys were more likely than girls to have identity diffuse, and mastery-avoidance goal, and girls have higher academic achievement scores than boys. In general, academic identity status and goal orientations accounted for variance on academic achievement.

Keywords: academic identity status, goal orientations, academic achievement





## 1. Introduction:

One of the interesting issues in educational psychology is to identify the cognitive, social and motivational factors affected academic achievement. As Flores-Crespo (2007) noted identity as a non-cognition factor has a central role in research on education, since under certain conditions it may influence school choices, classroom behaviours, career performance, and the disposition of adolescents towards schooling.

Identity as an important issue of human life was first considered by Erikson. According to Erikson (1968), identity formation is the major task of adolescence, and emerges as the adolescent copes with social demands and developmental challenges and attempts to give meaning to his choices and commitments of his life. Although Erikson deserves immense credit for calling attention to identity formation as a key psychosocial task, his thoughts on the matter did not lend themselves easily to empirical research methods. In Erikson perspective, identity is considered as something completely related to the context.

Based on Erikson's theory and two dimensions of exploration and commitment, Marcia (1966) presented an identity status paradigm, in an attempt to render the concept of identity formation amenable to research. Marcia (1993) identified four identity statuses by which late adolescents and young adults

undertake identity defining decision in different domains and namely:

Achievement (commitment followings exploration), Moratorium (low commitment, high exploration), Foreclosure (high commitment, low exploration) and Diffusion (low commitment, low or without exploration).

Theory of identity status has been criticised (such as: Cote & Levine, 1988; Luyckx et al., 2006), due to an emphasis on identity as a product of development processes, and giving little attention to the evolution of the concept of making some kind of identity and the limits of identity theory. Cote' and Levine (1988) claimed the idea that the identity status model, as one the common paradigm, has ignored the role of context and has viewed the identity status as agents within the individual.

Based on a social-cognitive perspective Berzonsky (1993, 2003) conceptualized identity as a self-theory. Self-theories serve as the frame of reference for processing and interpreting self-relevant information, encountered in the course of every day life. Individuals theorize about their self in different ways, and they vary in how they meet the situations in which they should make decisions, deal with personal problem, and process information (Berzonsky, 1990).

Berzonsky (1989) has identified three social-cognitive processing orientations or styles: Informational, Normative and Diffuse-Avoidant. An informational style is typical of Adolescents who seek out and evaluate self-related information actively. Adolescents with a normative identity style rely on the expectations, values and

prescriptions held by significant others when confronting with identity relevant problems (Berzonsky, 1990). Adolescents with a diffuse-avoidant identity style, tend to have behaviour that is controlled and dictated by situational demands (Berzonsky, 1990). According to Berzonsky identity styles and identity status are related together and identity statuses could be considered as a product of identity styles. It should be noted that identity styles theory is a general theory on identity formation.

Kroger (2000) suggested that research should be carefully carried out in areas in which identity development grows and Lannegrand-Willems and Busma (2006) emphasized the important role of school context in identity development of students. Recently, Was and Isaacson (2008) proposed the concept of academic identity.

According to Was and Isaacson (2008) Academic identity is the special part of "ego identity" and a distinctive aspect of the identity development. As Marcia's identity status paradigm, Was and Isaacson (2008) proposed four academic identity statuses: Achieved, Foreclose, Moratorium and Diffuse.

Diffuse academic identity status refers to failure in exploration and commitment which often entails failing to decide academic values-related decisions. Foreclosed academic identity status is defined as the student's commitment to the academic values taken from important people. Moratorium academic identity status denotes the time in which the student is going through

academic uncertainty and is trying to reach a conclusion about academic goals and values. Achieved academic identity status signifies a commitment to a set of academic values formed after a period of exploration (Was & Isaacson, 2008; Was, Harthy, Odent & Issacson, 2009).

Whereas the relationship between identity processing styles and academic achievement has been the subject of several researches, the relation between academic identity status and academic achievement is not investigated yet.

Hejazi, Shahraray, Farsinejad, and Asghary (2009) indicated that the informational style identity has positive effects on academic achievement and diffuse/avoidance identity style has a negative effect on academic achievement. Academic self-efficacy has mediated the role between identity style and academic achievement. According to Berzonsky and Kuk' findings (2005) there is no significant difference among the three identity styles and academic performance of college students.

Considering that the findings related to relations between identity styles and academic achievement are not consistent, and identity formation depend on the social context (school) in which individual is found, it seems that the academic identity can be a more appropriate predictor of academic achievement.

Generally, identity development is influenced by multiple factors and influences on multiple variables in individual. Currently, it is an accepted assumption that success and failure in academic tasks are fundamental building

blocks in the development of contemporary youth's identity components such as self-competence perceptions, personal values, intents and career goals (Kaplan & Flum, 2010; Wigfield & Wagner, 2005) on one hand and the motivation, particularly achievement goals on the other hand (Kaplan & Flum, 2010). Kaplan and Flum (2010) claimed a link between achievement goal orientations and identity formation styles and the findings of Was et al. (2009) confirmed the relation between achievement goals and academic identity status.

Achievement goal orientations theory is considered to be one of the most dominant frameworks for motivation in school (Pintrich & Schunk, 2002; Elliot, 1999). According to this theory, students construe meanings for achievement situations and that these meanings involve a comprehensive purpose for engagement in action (Dweck, 2000). As stated by Elliot and Murayama (2008), a goal is conceptualized as an aim that one is committed to that serves as a guide for future behaviour. This theory has been employed to predict and understand students' outcomes such as self regulation, interest in the subject matter and achievement (Kaplan & Maehr, 2007; Harackiewicz et al., 2002).

While several categories of achievement goal orientations have been suggested (Maehr & Nicholls, 1980; Ames, 1992; Dweck & Laggett, 1988), research in achievement goal theory focused on two competence-related purposes: mastery goals and performance goals.

Mastery goals refer to an orientation towards personal growth, deep learning, investing effort, approaching challenges and being imaginative (Ames, 1992; Nicholls, 1992; Kaplan & Flum, 2010). According to Elliot & Reis (2003), individual's capacity to adopt mastery goals can be said to be based on a fundamental human tendency for exploration.

Performance goals refer to an orientation towards demonstration of competence, engaging in tasks with the purpose of creating personal and public recognition and enhancing self worth (Ames, 1992; Dweck & Molden, 2005). As Leary (2007) mentioned, adopting a performance goal is based in motive for self enhancement.

Work on achievement goal orientations and the inconsistency in findings concerning performance goal, led to introduction of the distinction between approach and avoidance into achievement goal theory. As also, Elliot (1997), proposed performance-approach (to demonstrate ability personal) and performance-avoidance (to avoid demonstrate the inability).

Students who adopt approach goal orientation pay attention to their performance and see learning as a means to achieve their goal. Students, with an avoidance goal orientation, obtain positive judgments from others and also show his cleverness, in order to avoid punishment (Ryan & Pintrich, 1997). Was et al (2009), showed that achieved academic identity has a positive relation to mastery goals and negatively related to performance-avoidant goals. The relation between

academic moratorium identity and academic diffusion with performance-avoidant goals is positive. Foreclosed academic identity positively correlated with performance approach goal and performance-avoidant goal. These findings have revealed the link between academic identity status and trichotomous model of achievement goal orientations.

Recently, Elliot and McGregor (2001), proposed that mastery goal orientation may be divided into approach and avoid components. Individuals, who adopt a mastery-avoidance goal, work to avoid misunderstanding, are not interested in social comparisons and they are not ambitious in terms of self improvement. Mastery-approach goals are assumed to cause individuals to view the task as a challenge, elicit feelings of excitement and encourage cognitive and affective immersion in the activity for the sake of skill development and self-improvement (Elliot & Church, 1997; Elliot & McGregor, 2001; Rawsthorne & Elliot, 1999). It seems that the relations between academic identity statues and this new model of achievement goal orientations are not explored.

There are a number of studies investigating the effects of goal orientations on academic achievement. The findings have shown that mastery-orientation and performance-approach orientation have a direct and positive relation with academic achievement (Elliot, McGregor & Gable, 1999) and performance-avoidance goal orientation is negatively (Elliot & et al., 1999) correlated with academic achievement.

As Kaplan and Flum (2010) argued, school plays a role in providing guidelines for environmental strategies that would encourage students to adopt adaptive achievement goal orientations. Schooling is also, an important context for identity formation. In addition achievement goals and identity influence academic achievement. Based on the aforementioned, the questions of interest are: Are identity statues associated with achievement goal orientations? And can predict academic achievement?

The findings about sex differences in achievement goal orientations were not inconclusive. For example, in the study by Steinmary and Spinath (2008), learning goals differed between sexes in high school. Girls adopted learning goals more than boys and had lesser tendency to avoid work. There were no sex differences in performance-approach goals. In other study, Pekrun, Maier and Elliot (2006), showed that girls were higher in learning goals in German students but not in an American sample. According to the findings, it seems that adoption of achievement goals is related to the cultural context. Therefore, the other question of the present study is: are there sex differences in achievement goals?

As noted by Marcia (1980), there is no sex differences in the formation of identity development but male and female identity differ in content and field of identity. If we consider academic identity as a field of identity, are there sex differences in Iranian students' academic identity?



## 2. Method

### 2.1. Participants

Participants were 301 (159 male & 142 female) first year high-school students, at high schools in Azna city in Iran, selected through random cluster sampling. The average age was 15 years and 2 months with a standard deviation of 0.68.

### 2.2. Instruments

Two scales, that translated to Persian (English to Persian and Persian to English), were used; namely, the Academic Identity Style Measure and Goal Orientation questionnaire.

Academic identity status: The academic identity status measure (Was & Isaacson, 2008) employed in the present study contained four subscales, Moratorium ( $\alpha = 0.79$ ), Foreclose ( $\alpha = 0.51$ ), Diffuse ( $\alpha = 0.52$ ) and Achievement ( $\alpha = 0.81$ ), each with ten items. Results of exploratory factor analysis (KMO=0.874, Bartlett's Test of Sphericity=3269.278,  $df = 780$ , Sing=0.0001) indicated the considerable and significant contribution of each of the items in measuring academic identity status.

Goal orientation: The Goal Orientation Questionnaire (Elliot & McGregor, 2001) is comprised of 12 items, with three items composing each of the four types of goal orientations: mastery-approach goals ( $\alpha = 0.61$ ); mastery-avoidance goals ( $\alpha = 0.62$ ); performance- approach goals ( $\alpha = 0.61$ ) and performance- avoidance goals ( $\alpha = 0.48$ ). Indices obtained from confirmatory factor analysis ( $X^2/df=1.55$ , GFI=

0.96, AGFI= 0.93; RMSEA=0.043) Suggested the appropriate fit of the model with the data.

Academic achievement: The average of 10 exam scores in the final semester was considered as an index of academic achievement.

### 2.3. Procedure

A survey questionnaire composed of the Academic Identity Status Measure and The Goal Orientation questionnaire was distributed among participants during the second session. The data was analyzed by using Pearson coefficient correlation and stepwise regression.

### 3. Results

Table 1 shows mean, and standard deviation, of observed variables of the study based on sex. Considering Table 1, boys in the subscales of academic identity diffuse and foreclose and girls in subscales of academic identity moratorium, mastery -avoidance goal orientation and academic achievement have higher scores.

Table 1 Descriptive statistics of variables based on sex

Variable	Male		Female		Total	
	M	S	M	S	M	S
Academic identity	43.87	6.66	44.00	6.59	43.93	6.62
Moratorium identity	25.58	5.33	26.71	6.29	26.11	5.82
Diffuse identity	12.02	3.72	10.74	3.27	11.42	3.57
Foreclose identity	16.85	3.47	15.93	3.62	16.42	3.59
Mastery-approach	12.70	1.99	12.73	2.00	12.72	1.99
Mastery-avoidance	6.12	2.54	10.20	2.67	9.63	2.65

Performance-approach	11.40	2.23	11.74	2.21	11.56	2.23
Performance - avoidance	9.07	2.44	9.49	2.49	9.27	2.47
Academic achievement	11.37	4.69	13.78	4.01	12.50	4.54

In other subscales, there is no difference between boys and girls. Correlation coefficients of variables are presented in Table 2.

Contribution of each variable to determine the academic identity and goal orientation in predicting academic achievement was used to carry out stepwise regression analysis.

Table 2 Correlation matrixes of variables

Variable	M	SD	$\alpha$	1	2	3	4	5	6	7	8
Achievement identity	43.93	6.62	0.81	-							
Moratorium identity	26.11	5.82	0.79	-0.32**	-						
Diffuse identity	11.42	3.75	0.52	-0.24**	0.20**	-					
Foreclose identity	16.42	3.59	0.51	0.10 <sup>ns</sup>	0.20**	0.20**	-				
Mastery-approach	12.72	1.99	0.61	0.61**	-0.25**	-0.19**	-0.06 <sup>ns</sup>	-			

Mastery-avoidance	9.63	2.56	0.62	-0.16**	0.26**	0.03 <sup>ns</sup>	0.06 <sup>ns</sup>	-0.02 <sup>ns</sup>	-		
Performance-approach	11.56	2.23	0.61	0.47**	-0.09 <sup>ns</sup>	-0.15**	0.02 <sup>ns</sup>	0.45**	0.13*	-	
Performance -avoidance	9.27	2.47	0.48	-0.11 <sup>ns</sup>	0.31**	0.19**	0.26**	-0.12*	0.37**	0.05 <sup>ns</sup>	
Academic achievement	12.50	4.54	-	0.22**	-0.19**	-0.41**	-0.23**	0.23**	-0.04 <sup>ns</sup>	0.14*	-0.20**

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\*\*: $p \leq 0.01$ , \*: $p \leq 0.05$ , ns=non significant

Table 3 shows the summary of results.

Table 3: Summary of stepwise regression analysis predicting academic achievement

Inter variables	R	R <sup>2</sup>	f	b	$\beta$	t	p	a
Step1								18.479
Academic identity Diffuse	0.411	0.169	60.77	-0.523	-0.411	-7.790	0.001	
Step2								13.460
Academic identity Diffuse				-0.484	-0.381	-7.170	0.001	
mastery-approach orientation	0.439	0.193	35.630	0.360	0.158	2.98	0.001	
Step3								16.134
Academic identity Diffuse				-0.446	-0.350	-6.460	0.001	
mastery-approach orientation				0.355	0.156	2.97	0.003	
Academic identity foreclose	0.462	0.214	29.89	-0.186	-0.147	-2.790	0.006	

The results show that the most important variable in the academic identity subscale of the variance, in predicting academic achievement, is academic identity diffuse. Based on this analysis 16.9 percent of the variance of academic achievement alone through academic identity diffuse is predictable.

In the second step and by the introduction of mastery-approach goal orientation as the second variable, the prediction of academic achievement increased to 19.3 percent.

In the third step academic identity foreclose as the third variable was introduced and with academic identity diffuse and mastery-approach orientation, 21.4 percent of achievement is explained. Other variable in the prediction were not able to increase the contribution significantly.

According to the regression coefficients obtained from Table 10, academic identity diffuse (-0.446) mastery- approach goal orientation (0.355), and academic identity foreclose (-0.186) explain the variance in academic achievement and significant coefficients related to the other components are not significant. Therefore, we conclude that academic identity subscales diffuse and identity foreclose the negative contribution, mastery - approach goal orientation has positive and significant contribution in predicting academic achievement.

For examining the differences between boys and girls in academic identity status multivariate analysis of variance were used.

Results of the test for equality of covariance matrices showed that the assumption of homogeneity of covariance matrices is established. In other words F obtained is not significant ( $p < 0.05$ ). Results of the Levine test for equality of variances shows that other than academic identity foreclose assumption homogeneity of variance matrices is established.

Results of the Hotelling trace test showed that boys and girls are different in at least one academic identity status ( $F = 5.177$ ,  $p < 0.001$ ).

According to Table 4, which deals with investigating inter-group effects, boys and girls in diffuse and foreclose academic identity show significant difference.

Boys in diffuse academic identity ( $M=12.02$ ) compared with girls ( $M=10.74$ ), also in foreclose academic identity ( $M=16.85$ ) compared with girls ( $M=15.49$ ), achieved higher scores. In other identity statuses there is no significant difference between boys and girls.

Table 4 F-test for single variable effect of sex

Source	Dependent variable	SS	df	F	p
<b>gender</b>	Academic identity	1.236	1	0.028	0.867
	Moratorium identity	97.125	1	2.886	0.090
	Diffuse identity	122.697	1	9.934	0.002
	Foreclose identity	62.833	1	4.941	0.027

Results of the test for equality of covariance matrices showed that the assumption of homogeneity of covariance matrices is established. In other words, obtained F is not significant ( $p<0.05$ ). Results of the Levine test for equality of variances shows that for goal orientation assumption homogeneity of variance matrices is established.

Results of the Hotelling trace test showed that boys and girls of at least one goal orientation have different ( $F=3.387$ ,  $p<0.001$ ).

According to Table 5, which deals with investigating inter-group effects, only in mastery-avoidance goal orientation, boys and girls show significant difference.

Girls in mastery-avoidance goal orientation ( $M=12.02$ ) compared with boys ( $M=10.74$ ), achieved higher scores in the identity foreclose ( $M=10.20$ ) and girls ( $M=9.12$ ) scores more have been. In the other goal orientation isn't significant difference between boys and girls.

Table 5 F single-variable test to evaluate the effect of sex

Source	Dependent variable	SS	df	F	p
gender	Mastery-approach	0.094	1	0.024	0.878
	Mastery-avoidance	86.87	1	12.821	0.001
	Performance-approach	8.504	1	1.719	0.191
	Performance - avoidance	13.087	1	2.150	0.144

Independent t-test was used in order to differentiate achievement scores in boys and girls. One of its assumptions is the principle of homogeneity of variance. Levine test results show that this principle is violated. In this case, results are reported with the presupposition that the equality of variance is violated.

Table 6 T-test comparing boys and girls academic achievement

	Levene's Test for Equality of Variances		
	f	p	T
Equal variances assumed	5.678	0.018	-4.670
Equal variances not assumed			-4.802

T-test results show aspects of the academic achievement of boys and girls together are significantly different. Girls in academic achievement ( $M=13.78$ ) compared with boys ( $M=11.37$ ), achieved higher scores.

#### 4. Conclusion

The purpose of this study was to investigate the relationship between academic identity status, goal orientations and academic achievement among students in the first year of high school. The results showed that generally, academic identity status, goal orientation and academic achievement are related.

Based on the findings, diffuse academic identity status predicts the highest proportion of variance in academic achievement. According to Was et al. (2009) diffuse academic identity is marked by the failure in exploration and commitment to academic values. As Berzonsky (2004) cited, individuals with a diffuse-avoidant identity have an inconsistent self-theory. This inconsistency influences their beliefs about their own capabilities and leads to feelings of low self-efficacy. In addition, this feeling of inconsistency, which is associated with ineffective cognitive strategy use, and lack of educational purpose (Nurmi et al., 1997; Berzonsky & Kuk, 2005), leads to a decrease in academic achievement. This finding is line with Hejazi et al. (2009) findings and confirm this view that students with diffuse academic identity lack stable and clear academic goals, possess low levels of



academic skills and academic self – regulation and are at an increase risk for academic problem.

The present findings indicated that foreclosed academic identity is related to academic achievement negatively. In explaining this result, it should be noted that people with foreclosed academic identity are not self-regulated but are other-regulated. And also make use of learning strategies offered by other important people (Was, Wessel & Isaacson, 2007). It seems that this academic identity status is not an adaptive strategy for achieving in school. Also, it should be noted that our sample were just entered to high school and were not still committed to school settings and therefore have not been able to internalize the new standards in new context.

According to the results of the present study, approach-mastery goal orientation is positively and significantly correlated with academic achievement and these results are consistent with the previous research (Elliot et al., 2005; Sideridis, 2005). However, the current results are also inconsistent with some other findings (e.g., Wolters, 2004; Elliot et al., 1999) which showed that approach-mastery goal orientation is not correlated with academic achievement. In explaining these results, it should be mentioned that students with approach-mastery orientation possess high internal motivation, improve their abilities in learning tasks, involve themselves in challenging tasks and as a result have high academic achievement.

Other findings of the present study are the significance (positive) relation between approach-mastery, performance-approach goals and achievement academic identity. These findings which are in line with previous finding (Was et al., 2009), confirm this claim that the mastery goal orientation and achievement identity have a common characteristic namely exploration which is important for achieving. Our findings also showed that diffused identity and foreclosed identity are related to mastery-avoidant and performance avoidant goals positively. This finding indicated that the failure of commitment and exploration (diffused identity) or normative commitment to others' values (foreclosed identity) lead to the non adaptive goal orientations. These findings have important implications for education of adolescents in Iran. The educational system in Iran focuses in academic achievement and encourages foreclosed identity. This system ignores other developmental needs of students like autonomy (exploration) and future orientation. Our findings clearly show that the schools should pay more attention to the development of identity and consider identity as an important variable in adopting goal orientations and achievement behaviour.

Results of the study show that in comparison with girls, boys in diffused academic identity get higher scores. Generally speaking, some studies indicated that boys in diffused identity (Yunus et al., 2010) and diffused-avoidance identity style (Berzonsky, 1994) significantly get higher scores. In generally, boys are often under the strain of unemployment and drug addiction and this might be a possible

cause of increasing number of boys in diffuse-avoidance identity style (Berzonsky, 1994). Besides, in academic fields, boys are facing dilemmas. On one hand, they are encouraged to take part in academic and scientific areas and on the other hand they have to confront the problem of unemployment facing new university graduates. Thus, it can be stated that boys are more diffused than girls. The results of the study show that boys have foreclosed academic identity more than girls. Possibly the reason for this difference is that girls attempt to exploring new and untraditional roles more than boys. Therefore, it seems that girls have more tendencies to make their own values in life and especially in education area and boys have more tendencies to stay in the traditional framework. These findings show the characteristics of Iran as a transitional society to modernity.

The results indicate that girls with the avoidance-mastery goal are more than boys. This difference is possibly due to the importance of education for girls considering it as a passage to social life. Furthermore, through the process of socialization, it is expected that girls be non assertive and be less competent than boys. Accordingly, they have more fear of failure and worry about it. Our results suggest that girls outperform boys in overall grade average and this can be attributed, on one hand, to the decreased of academic motivation in boys and, on other hand, to girls' positive attitude toward education. It seems that girls show much greater motivation and engaged in academic area more than boys.

Also the findings of the present study indicated that academic identity statuses should be considered like an effective variable on academic achievement and goals orientation among Iranian students. Due to the present results, we propose to study the relationship between identity styles, academic identity and achievement goal orientations in transition of high school to university.

## References:

- Ames, C. (1992). Classroom: goals, structures and student. *Journal of Educational Psychology*. 84, 241-261.
- Berzonsky, M. D. (1989). Identity Style: Conceptualization and measurement. *Journal of Adolescent Research*, 14(3), 268-282.
- Berzonsky, M. D. (1990). Self-construction over the life-span: A process perspective on identity formation. In G. J. Neimeyer & R. A. Neimeyer (Eds.), *Advances in personal construct psychology* (vol. 1, pp. 155–186). Greenwich, CT: JAI Press.
- Berzonsky, M. D. (1993). A constructivist view of identity development: People as post-positivist self theorists, In J. Kroger (Ed.), *Discussion on ego identity*, Hillsdale, NJ: Lawrence Erlbaum Associates.
- Berzonsky, M. D. (1994). Self-identity: the relationship between process and content. *Journal of Research personality*, 28, 453-460.
- Berzonsky, M. D. (2003). Identity style and well-being: Does commitment matter? *Identity: An International Journal of Theory and Research*, 3(2), 131-142.
- Berzonsky, M. D. (2004). Identity processing style, self-construction, and personal epistemic assumptions: A social–cognitive perspective. *European Journal of Developmental Psychology*, 1(4), 303-315.

- Berzonsky, M. D., & Kuk, L. S. (2005). Identity style, psychosocial maturity, and academic performance. *Journal of Personality and Individual Differences*, 39, 235-247.
- Côté, J. E. , & Levine, C. (1988). A critical analysis of the ego identity status paradigm, *Developmental Review*, 8, 147-184.
- Dweck, C. (2000). *Self –Theories: Their role in motivation, personality, and development*, Philadelphia: Psychology Press.
- Dweck, C. S., & Leggett, E. L. (1988). A social cognitive approach to motivation and personality. *Psychological Review*, 95, 256- 273.
- Dweck, C. S., & Molden, D. C. (2005). Self-Theories: Their impact on competence motivation and acquisition. In A. Elliot, C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 122-140). New York: Guilford Press.
- Elliot, A. J. (1997). Integrating the ‘classic’ and ‘contemporary’ approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In M. L. Maehr, & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (pp. 143–179). Greenwich, CT: JAI Press Inc.
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Journal of Educational Psychologist*, 34, 149–169.

- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 72, 218–232.
- Elliot, A.J., & McGregor, A. (2001). A 2×2 achievement goal frameworks. *Journal of Personality and Social Psychology*, 80 (3), 510–519.
- Elliot, A.J., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application, *Journal of Educational Psychology*, 100,613-628.
- Elliot, A. J., McGregor, A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology*, 91 (3), 549-563.
- Elliot, A.J., & Reis, H.T. (2003). Attachment and exploration in adulthood, *Journal of Personality and Social Psychology*, 85, 317–331.
- Elliot, A.J., Shell, M.M., Henry, K.B. & Maier, M.A. (2005). Achievement goals, performance contingencies, and performance attainment: an experimental test. *Journal of Educational Psychology*, 97 (4), 630–640.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.
- Flores-Crespo, P. (2007). Ethnicity, identity and educational achievement in Mexico, *International Journal of Education Research*, 27,331-339.

- Harackiewicz, J.M., Barron, K.E., Pintrich, P.R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology*, 94, 638-645.
- Hejazi, E., Shahraray, M., Farsinejad, M., & Asgary, A. (2009). Identity style and academic achievement: mediating role of academic self-efficacy. *Social Psychology of Education*, 12, 123-135.
- Kaplan, A., & Flum, H. (2010). Achievement goal orientations and identity formation styles. *Journal of Educational Research Review*, 5, 50-67.
- Kaplan, A., & Maehar, M. L. (2007). The contribution and prospects of goal orientation theory, *Educational Psychology Review*, 19, 141-187.
- Kroger, J. (2000). Ego identity status research in the new millennium. *International Journal of Behavioural Development*, 24(2), 145-148.
- Lannegrand-Willems, L., & Bosma, H. A. (2006). Identity development-in-context: The school as an important context for identity development. *Identity, Journal of Theory and Research*, 6(1), 85-113.
- Leary, M. R. (2007). Motivational and emotional aspects the self, *Annual Review of Psychology*, 58, 317-344.
- Luyckx, K., Goossens, L., Soenens, B., & Beyers, W. (2006). Unpacking commitment and exploration: Preliminary validation of an integrative model of late adolescent identity formation. *Journal of Adolescence*, 29, 361-378.



- Maeher, M. L., & Nicholls, J.G. (1980). Culture and achievement motivation: A second look, In N.Warren (ed.), *Studies on cross-cultural psychology* (pp.221-267), New York: Academic Press.
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, 3, 551-558.
- Marcia, J. E. (1980). Identity in adolescence. In J. Abelson (Ed.), *Handbook of adolescent psychology* (pp. 159–187). New York: John Wiley.
- Marcia, J. E. (1993). The ego identity status approach to ego identity, In J. E. Marcia, A. S. Waterman, D. R. Matteson, S. L. Archer, J. L. Orlofsky (Eds.), *Ego identity: A handbook for psychological research*, New York: Springer-Verlag.
- Nicholls, J. G. (1992). Students as educational theorists. In D. Schunk, & J. Meece (Eds.), *Student perceptions in the classroom* (pp. 267–286). Hillsdale, NJ: Lawrence Erlbaum (Chapter 12).
- Nurmi, J. E., Berzonsky, M.D., Tammi, K., & Kinney, A. (1997). Identity processing orientation, cognitive and behavioural strategies and well-being, *International Journal of Development*, 21, 555-570.
- Pekrun, R., Elliot, A. J., & Maier, M.A. (2006). Achievement goals and discrete achievement emotions: A theoretical model and prospective test, *Journal of Educational Psychology*, 98, 583-597

- Pintrich, P.R. & Schunk, D. H. (2002). *Motivation in Education: Theory, Research & Applications*. New Jersey: Johnston.
- Rawsthorne, L.J., & Elliot, A.J. (1999). Achievement goals and intrinsic motivation: A meta-analytic review. *Personality and Social Psychology Review*, 3, 326-344.
- Ryan, R.M. & Pintrich, P.R. (1997). Should I ask for help? The role of motivation and attitude in adolescent's help seeking in math class. *Journal of Educational Psychology*, 89 (2), 329–341.
- Sideridis, G. D. (2005). Goal orientation, academic achievement, and depression: evidence in favour of a revised goal theory framework. *Journal of Educational Psychology*. 97 (3), 366-375.
- Stienmayr, R., Spinath, B. (2008). Sex differences in school achievement: What are the roles of personality and achievement motivation?, *European Journal of Personality*, 22,185-209.
- Was, C.A., & Isaacson, R.M. (2008). The development of a measure of academic identity status. *Journal of Research in Education*, 18, 94-105.
- Was, C.A., Wessel, A., & Isaacson, R. M. (2007). Academic identity status accounts for unique variance in college students' study strategies. *Association for Psychological Science 19<sup>th</sup> Annual Convention*, 1-8.

- Was, C. A., Harthy, I. A., Oden, M.S., & Isaacson, R. M. (2009). Academic identity status and relationship to achievement goal orientation. *Electronic Journal of Research in Education Psychology*, 7 (2), 627-652.
- Wigfield, A., & Wagner, A. L. (2005). Competence, motivation, and identity development during adolescence, In A. J. Elliot, & C.S. Dweck (Eds.), *Handbook of competence and motivation* (pp, 222-239), New York: Guilford Press.
- Wolters, J. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement, *Journal of Educational Psychology*, 96, 236–250.
- Yunus, F.W., Kamal, A. A., Jusoff, K., & Zakaria, A. (2010). Gender differences on the identity status of Malaysian preparatory students, *Journal of Canadian Social Science*, 6(2), 145-151.