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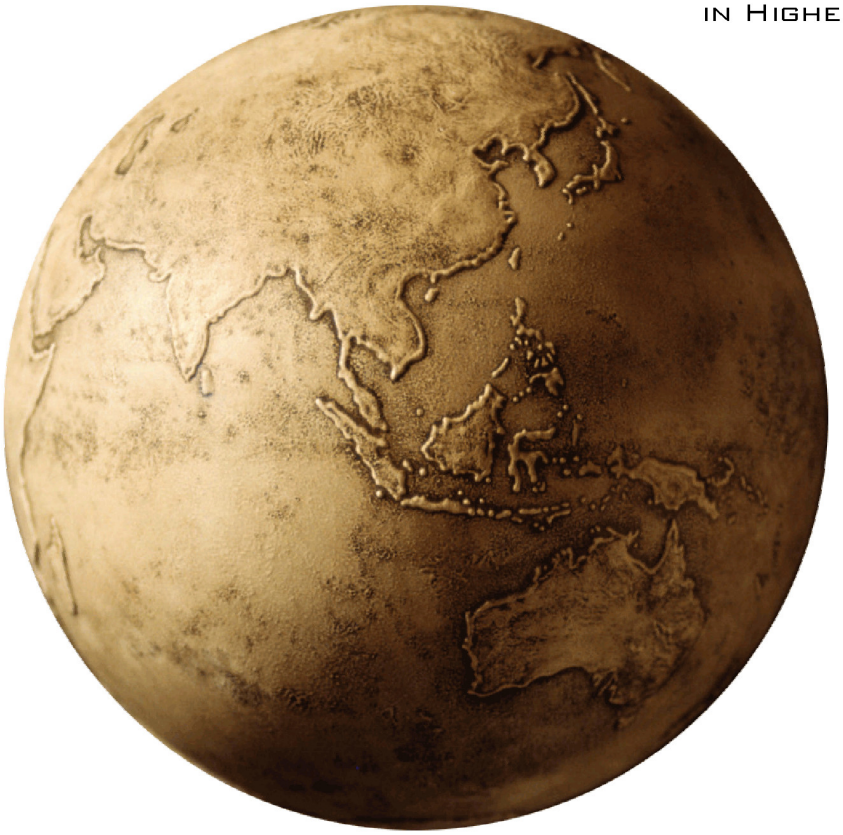

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The International Journal of Teaching and Learning in Higher Education (ISSN 1812-9129) provides a forum for the dissemination of knowledge focused on the improvement of higher education across all content areas and delivery domains. The audience of the IJTLHE includes higher education faculty, staff, administrators, researchers, and students who are interested in improving post-secondary instruction. The IJTLHE is distributed electronically to maximize its availability to diverse academic populations, both nationally and internationally.

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**Research Articles**



**Instructional Articles**

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# Instructors' Perceptions of their Students' Conceptions: The Case in Undergraduate Mathematics

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How a student conceives the nature of a subject they study affects the approach they take to that study and ultimately their learning outcome. This conception is shaped by prior experience with the subject and has a lasting impact on the student's learning. For subsequent education to be effective, an instructor must link the current topic to the student's prior knowledge. Short of assessing their students, an instructor relies on their subjective experience, intuitions, and perceptions about this prior knowledge. These perceptions shape the educational experience. The current study explores, in the context of undergraduate mathematics, the alignment of instructors' perceptions of student conceptions of mathematics and the students' actual conceptions. Using a version of the Conceptions of Mathematics Questionnaire, instructors of lower-year courses were found to have overestimated, while upper-year course instructors underestimated, their students' fragmented conceptions of mathematics. Instructors across all years underestimate their students' cohesive conceptions. This misalignment of perspectives may have profound implications for practice, some of which are discussed.

It is now well established that the perceptions a student has of a subject they study affects their approach to studying, and ultimately their performance in, that subject (Biggs & Tang, 2011; Trigwell & Prosser, 1991). A deeper, connected view of the subject correlates to a deeper approach to study and better outcomes, both in terms of quantitative performance (e.g., assessment scores) and conceptual gains (Trigwell & Prosser, 1991). Fragmented, superficial perspectives often result in less desirable outcomes. Given this evidence on the impact of a student's perspective of a subject on their performance in that subject, a key to improving student performance may be in fostering shifts in their perceptions. That is, students may come to view a subject more cohesively if the learning situations they experience emphasize the cohesive structure of the subject. A major barrier to implementing this shift may lie with the instructors. Do instructors actually know how their students view their subject? An exploration of this question in the context of undergraduate mathematics is the topic of this study.

Fragmented conceptions of a subject include viewing the subject as a disjointed collection of facts and/or operations (Crawford, Gordon, Nicholas, & Prosser, 1994; Crawford, Gordon, Nicholas, & Prosser, 1998a; Crawford, Gordon, Nicholas, & Prosser, 1998b). These facts and/or operations can be applied to solve problems, but a larger, complete picture is lacking. Students who hold fragmented conceptions of a subject learn topics in isolation and generally lack connections between these topics. A cohesive conception sees the facts as interrelated, comprising a consistent and logical totality. Applications still remain, and a cohesive view allows the student to draw on a richer set of tools for use with these applications.

In terms of mathematics, the subject considered in the present study, fragmented and cohesive conceptions, have for some time played a central role in the mathematics education discourse. Fragmented conceptions of mathematics are closely linked to the *instrumental understanding* of Skemp (1976) and the *procedural knowledge* of Hiebert and Lefevre (1986). With this type of understanding a student knows that a procedure, for example, is appropriate given the context but is not necessarily able to apply the procedure efficiently or flexibly. The procedure is for the student an isolated and rigid construct. For example, a student may be able to solve a system of equations consistently with a certain algorithm but not understand the algorithm deeply enough to modify it for use in a given situation (Star, 2005). Cohesive conceptions resemble Skemp's (1976) *relational understanding* and Hiebert and Lefevre's (1986) *conceptual knowledge*. This level of understanding involves a richer experience of mathematics. Students with this level of understanding comprehend why a procedure is appropriate for a given context and are able to tailor the procedure to make it more efficient. These students are also able to draw upon a number of procedures, perhaps innovating their own, and decide upon which is most appropriate.

Of course, a subject like mathematics comprises both procedures and concepts, and a university mathematics curriculum requires students to be proficient in both. How these two constructs interact and develop in a student's mind is still a matter of debate, but it is generally agreed upon that solid conceptual knowledge facilitates procedural knowledge more easily than the reverse. The most current research suggests that both are best developed in an iterative process, with gains in procedural knowledge balanced with gains in conceptual knowledge, and vice versa (Rittle-Johnson & Schneider, 2014). However, if students view mathematics as a disjointed collection of

procedures and facts—that is, if they have a fragmented view of mathematics—without regard to the greater conceptual structure of mathematics, this balancing of procedures and concepts may be a difficult task.

How students view a subject also affects their approach to learning that subject. Students who hold a fragmented view of a subject tend to adopt surficial approaches to study, focusing on memorization and the acquisition of facts and procedures for immediate use. The act of study for such students is geared toward the completion of tasks, involves lower-level skills, such as memorization, and seldom involves longer-term retention (Biggs & Tang, 2011). Students with a cohesive view, on the other hand, are more likely to take a deep approach to study, focusing on understanding and seeing the subject as a connected whole; see (Prosser & Trigwell, 1999) for a review of the early literature and (Biggs & Tang, 2011) for an updated review. These approaches to study translate into different learning outcomes (Biggs, 1979; Marton & Säljö, 1976). Deep approaches have been found to correlate with higher course grades—though not always (Campbell & Cabrera, 2014; Choy, O'Grady, & Rotgans, 2012; Trigwell & Prosser, 1991)—and greater conceptual gains, while surficial approaches often result in less desirable outcomes (Watkins, 2001; Zeegers, 2001).

In this current study, students and their instructors were given a survey designed to measure their conceptions of mathematics. While the students were asked to complete it as truthfully as possible, the instructors were asked first to reflect on their current class and form an image of their "archetypal" or "average" student and then to complete the survey as they think this archetypal student would. The intention with this exercise was to quantify a practice commonly done by mathematics instructors. Anecdotally—though, also see (Engelbrecht, Harding, & Potgieter, 2005)—instructors often refer to their students using statements such as, "My students do not understand this concept," or, "They think of math as just pushing numbers around." These perceptions may be partially informed by responses by students on assessments, but they also comprise instructor perception bias. The educational experiences offered by the instructors are, in turn, shaped by these perspectives of their students. A companion study (Maciejewski & Merchant, 2015) evaluates the relationship between the questionnaire scores reported here, study approaches taken by the students, and resulting course grade.

The results of this study indicate a divide between how instructors perceive their students' view the nature of mathematics and how the students actually view mathematics. The direction of this divide, whether instructors over or underestimate aspects of their students' conceptions, is dependent upon the level of the course being taught by the instructor.

## Methods

### Participants

An email invitation to participate in the current study was circulated in the second regular semester of the 2013/2014 school year to all members of the mathematics department of a major Canadian research university who were currently teaching a course. In total, 23 instructors responded and volunteered to participate. These instructors also agreed to have the students of one of their current courses, as some instructors were teaching more than one course, contacted and invited to participate. All students in the 23 classes were sent email invitations and 322 students across the 23 courses volunteered to participate. A random draw for four gift cards for campus student businesses was used as an incentive.

Student participation by course varied, from four in the sole fourth-year course to 23 in a second-year course. On average the participation rate by course was roughly 15%. However, this study concerns students and instructors grouped by course year. The numbers for this partitioning are in Table 1. Since there was only one fourth-year course, and since this course had only four study participants, the course was grouped with the third-year courses to create the third/fourth-year category. A comparison between the mean course grade of each course sample with that of the entire course revealed no systematic sample bias (results not reported). Therefore, there is no evidence to suggest the samples are not representative.

### Measures

The students and instructors completed a version of the Conceptions of Mathematics Questionnaire (CMQ) (Crawford et al., 1998a). The CMQ used in this study and the preambles given to the students and instructors are found in the Appendix. The CMQ gives scores to a participant on two scales that correspond to fragmented and cohesive conceptions of mathematics. Fragmented conceptions comprise viewing mathematics as essentially a computational system and a body of factual knowledge. Cohesive conceptions involve viewing mathematics as a system of logic inspired by, and useful in, solving authentic problems. Facts and procedures are still present, and a cohesive conception views these as facets of a totality.

These two scales derive from a phenomenographic study in which students responded to the question, "Think about the maths you've done so far. What do you think mathematics is?" (Crawford et al., 1994). Two themes emerged. Some students described mathematics as the study of numbers and their applications in other disciplines. Views like these were

Table 1
*Number of Students and Instructors/Courses by Course Year*

| Year | Number of Students | Number of Instructors/Courses |
|---|---|---|
| 1st | 169 | 11 |
| 2nd | 100 | 6 |
| 3rd/4th | 53 | 6 |

classified as fragmented conceptions of mathematics. Those with cohesive conceptions tended to describe mathematics as a logical or abstract system that is applicable to the study of the physical world, but also as a system that itself can be studied. These survey responses were used to generate the CMQ (Crawford et al., 1998). Since the questionnaire's initial publication it has been used with, and validated for, a variety of different populations (Alkhateeb, 2001; Liston & O'Donoghue, 2009; Macbean, 2004; Mji, 1999; Mji, 2003; Mji & Alkhateeb, 2005; Mji & Klaas, 2001). The initial publication on the CMQ (Crawford et al., 1998a) reports excellent internal consistency, in terms of Cronbach's alpha, for both fragmented ($\alpha = 0.85$, post-test) and cohesive ($\alpha = 0.88$, post-test) scales, which has been confirmed in the subsequent publications cited previously.

The fragmented and cohesive scales are not mutually exclusive, though reported as such in at least one study (Mji, 2003). Some of the statements in the CMQ that correspond to a fragmented conception may be agreed with by someone who holds a strongly cohesive conception of mathematics. This is not an inconsistency. Indeed, an applied mathematician may agree that mathematics is "...about formulae and applying them to everyday life and situations," (fragmented) while simultaneously agreeing that "[m]ath is a logical system which helps to explain the world around us" (cohesive). Or, perhaps less apparent, a number theorist may agree that "[f]or me, math is the study of numbers," (fragmented) and that "[m]ath is like a universal language which allows people to communicate and understand the universe" (cohesive). As Crawford and colleagues (1994) identify, a cohesive conception of mathematics encompasses aspects of fragmented conceptions, such as mathematics as procedures, though the scope of these aspects is wider and is a part of a greater connected whole for one who holds a cohesive conception of mathematics.

## Analysis of Data

The CMQ survey responses for both instructors and students were first analyzed separately to verify underlying factors and validity. Since the CMQ has not previously been used with a demographic comparable to the current one, a principal component analysis with varimax rotation was performed for both the student and instructor data, and the results are reported in Table 2. The aggregate student data confirms the factor structure first reported in Crawford and colleagues (1998b). The student data was subsequently broken down into first, second, and third/fourth year sets, and analyses on these data reveal the same factor structure for these subsets of the sample (results are not reported). As was found in Crawford and colleagues (1998b), item 15 was revealed to be inconsistent and was dropped from further analyses.

The analysis of the instructor survey responses also reveals the expected factor structure; see Table 2. Though the sample was much smaller ($n = 23$) than typically recommended sizes for such an analysis—recommendations that can vary widely (Mundfrom, Shaw, & Ke, 2005)—the loadings on the two factors are quite favorable (de Winter, Dodou, & Wieringa, 2009). Many of the large positive covariances loading on one factor were matched with large negative covariances loading on the other factor. However, some of the variables are worthy of examination: item 4 loads only weakly on factor 1, and item 6 is somewhat inconsistent. Both were retained in subsequent analysis, with item 4 being attributed to factor 1 and item 6 attributed to factor 2. Also, item 15 was revealed to load on factor 1 and have a negative covariance with factor 2, a result originally anticipated by Crawford and colleagues (1998b). Item 15 was dropped from further analyses to correspond to the student survey data.

A test of internal consistency using Cronbach's alpha was also performed (Cronbach, 1951). Results are reported in Table 3. Both scales for both student and instructor samples show strong internal consistency. Considering comparisons are made between subsets of these samples determined by course year, further reliability analyses were performed on these subsets. The results are in Table 4. As is shown, good to excellent reliability exists for both students and instructors in the three given year categories.

Having confirmed the factor structure and reliability of the two samples, comparisons are made between the year subsets. Figure 1 presents the mean student and instructor CMQ scores for both the fragmented and cohesive scales, and Table 5 reports the difference in means of instructor and student CMQ scores. Note that a positive value indicates the

Table 2
*Student and Instructor Conceptions of Mathematics Questionnaire Factor Analysis*

| | | Students | | Instructors | |
|---|---|---|---|---|---|
| | Items | Factor 1 | Factor 2 | Factor 1 | Factor 2 |
| Fragmented Items | Q1 | 0.71 | -0.13 | 0.88 | 0.01 |
| | Q2 | 0.57 | -0.06 | 1.27 | -0.34 |
| | Q4 | 0.52 | -0.34 | 0.24 | 0.05 |
| | Q5 | 0.72 | -0.11 | 0.79 | -0.42 |
| | Q7 | 0.63 | 0.11 | 0.87 | -0.33 |
| | Q9 | 0.70 | 0.06 | 0.93 | -0.30 |
| | Q12 | 0.53 | 0.11 | 0.64 | -0.38 |
| | Q13 | 0.73 | 0.08 | 0.99 | -0.49 |
| | Q16 | 0.65 | 0.08 | 1.13 | -0.34 |
| | Q18 | 0.62 | 0.11 | 0.60 | -0.25 |
| Cohesive Items | Q3 | -0.05 | 0.40 | -0.60 | 0.69 |
| | Q6 | 0.07 | 0.55 | 0.32 | 0.81 |
| | Q8 | -0.04 | 0.66 | -0.34 | 0.54 |
| | Q10 | 0.08 | 0.73 | -0.20 | 0.62 |
| | Q11 | 0.01 | 0.72 | -0.16 | 0.57 |
| | Q14 | 0.11 | 0.50 | -0.17 | 0.56 |
| | Q15 | 0.56 | 0.32 | 0.58 | -0.21 |
| | Q17 | 0.03 | 0.54 | -0.24 | 0.66 |

*Note.* Covariances reported

Table 3
*Conceptions of Mathematics Scale Items and Internal Consistency*

| | Cronbach's alpha | |
|---|---|---|
| Scale and Representative Item | Students | Instructor |
| Fragmented<br>Mathematics is about playing around with numbers and working out numerical problems. | 0.85 | 0.94 |
| Cohesive<br>Mathematics is a theoretical framework describing reality with the aim of helping us understand the world. | 0.83 | 0.85 |

Table 4
*Conceptions of Mathematics Internal Consistency by Course Year*

| | Cronbach's alpha | | | |
|---|---|---|---|---|
| | Student | | Instructor | |
| Year | Fragmented | Cohesive | Fragmented | Cohesive |
| 1 | 0.80 | 0.85 | 0.90 | 0.88 |
| 2 | 0.85 | 0.83 | 0.72 | 0.82 |
| 3 / 4 | 0.90 | 0.75 | 0.90 | 0.75 |

instructor mean was greater than the student mean while a negative value indicates the instructor mean was less than the student mean. Welch's t-Tests (Welch, 1947) were conducted on the differences between means, and the resulting $p$ values are reported in the Table 5. It was found that the mean fragmented score for the instructors (First Year (FY): $M = 3.75$, $SD = 0.63$; Second Year (SY): $M = 3.45$, $SD = 0.34$) was higher than the mean fragmented score for the students (FY: $M = 3.52$, $SD = 0.54$; SY: $M = 3.13$, $SD = 0.64$) in the first two years; not statistically significant for the first year, but significant for second year, $t(7) = 2.05$, $p$

Figure 1
*Average Fragmented and Cohesive CMQ Scores for Instructors (Circles) and Students (Squares)*

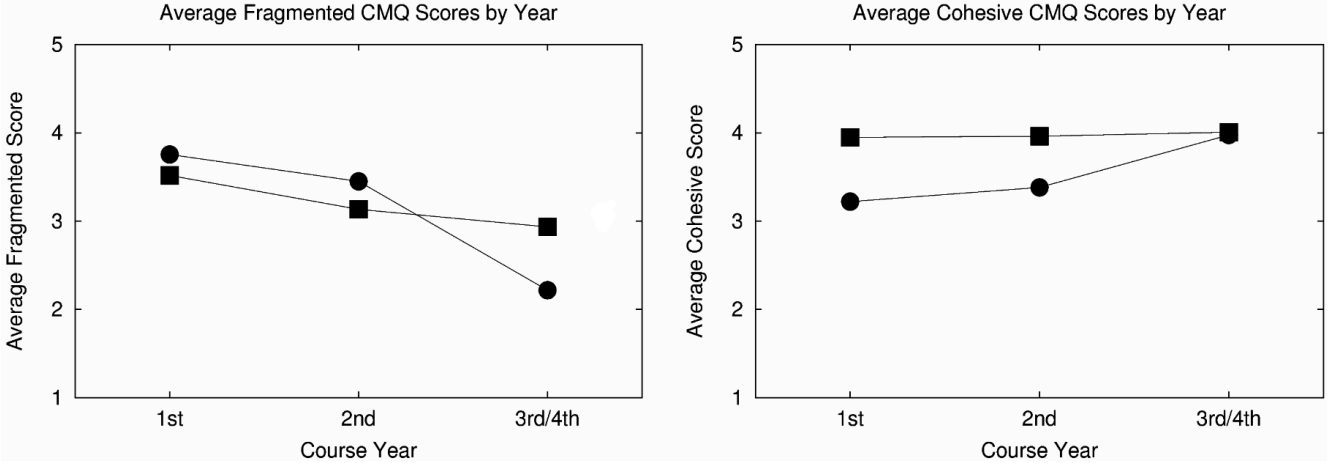


Table 5
*Difference Between Instructor and Student Mean CMQ Scores*

| | Difference in Mean Scores | | Significance (p=___) | | Effect Size (d=____) | |
|---|---|---|---|---|---|---|
| Year | Fragmented | Cohesive | Fragmented | Cohesive | Fragmented | Cohesive |
| 1 | 0.24 | -0.73 | 0.11 | 0.002 | 0.43 | -1.23 |
| 2 | 0.32 | -0.58 | 0.04 | 0.02 | 0.50 | -1.03 |
| 3 / 4 | -0.72 | -0.03 | 0.05 | 0.56 | -0.89 | -0.07 |

*Note*. A positive (resp. negative) difference indicates the instructor mean was greater (less) than the student mean.

= 0.04. This result is reversed in the third- and fourth-year group. There the instructors' mean fragmented score ($M$ = 2.22, $SD$ = 0.89) is significantly less than the students' mean fragmented score ($M$ = 2.93, $SD$ = 0.80), $t(6) = -1.89$, $p = 0.05$. In all years the instructors' mean cohesive score is less than the students' mean cohesive score, very significantly for the first two years ($t(11) = -3.76$, $p < 0.01$ and $t(6) = -2.74$, $p = 0.02$, respectively), but not significant for the third and fourth years.

An effect size analysis was performed using Cohen's $d$ (Cohen, 1988) to understand better the relative differences in the means. These values are reported in Table 5. The effect size for the differences in mean fragmented conception scores in the first two years are moderate (FY: $d = 0.43$; SY: $d = 0.50$) and large for the final two years, $d = 0.89$. For the differences in the mean cohesive conception scores, the effect is large in the first two years and practically nil in the last two.

Since there is such a marked difference in the instructors' perspectives in the first two and the last two years, it is worthwhile to evaluate if there is a similar difference in the students' conceptions. Table 6 reports the differences in student conceptions between years. There is a very significant negative difference in mean fragmented score between first and second year, $t(181) = -5.00$, $p < 0.01$, and a somewhat significant negative difference in mean fragmented score between second and third/fourth year, $t(88) = -1.56$, $p = 0.06$. There are slight positive differences in mean cohesive scores, but neither of these differences is significant.

**Summary of Results**

When asked to complete the conceptions of mathematics questionnaire as they think their archetypal student would, instructors in the first two years score, on average, significantly higher on the fragmented scale and significantly lower on the cohesive scale than their students. Instructors in the last two years score, on average, significantly lower on the fragmented scale and somewhat lower on the cohesive scale than their students.

There is a marked difference between first/second year and third/fourth year instructors' fragmented and cohesive scores. This suggests the possibility that there is a significant difference between how instructors of lower and upper-year courses perceive their students' conceptions of mathematics.

Table 6
*Difference in Student Average CMQ Scores Between Years*

| Year | Fragmented | | | Cohesive | | |
|---|---|---|---|---|---|---|
| | Average | Difference | Significance (p=___) | Average | Difference | Significance (p=___) |
| 1 | 3.52 | N/A | N/A | 3.95 | N/A | N/A |
| 2 | 3.13 | -0.34 | $p \approx 0$ | 3.96 | 0.01 | .57 |
| 3 / 4 | 2.93 | -0.20 | 0.06 | 4.00 | 0.05 | 0.70 |

Students, on average, have greater fragmented conceptions of mathematics in the first two years than in the last two, but they are fairly consistent in their cohesive views across all years. This contrasts with their instructors' difference in perspective.

## Discussion

This study has found that university math instructors may perceive their students as conceiving mathematics differently than what they actually do. Lower-year instructors perceive their students to have greater fragmented conceptions and much lower cohesive conceptions, while upper-year instructors perceive their students to have much less fragmented conceptions. Essentially, there is a clear divide between how instructors of early year and later year courses think their students view mathematics. This stands in contrast to how the students actually view mathematics. First year students hold much higher fragmented conceptions than later, third/fourth-year students—which is expected, as many of the first year courses are "service" courses taken by students in programs where math is otherwise not a major component. These first-year courses are, for many students, terminal in that they are the extent of university mathematics these students will experience. But even though there is a prominence of fragmented conceptions in the earlier years, instructors overestimate how prominent these conceptions are. Though these conceptions are lower in the later years, upper-year instructors underestimate how widely held they actually are. Instructors in all years underestimate their students' cohesive conceptions of mathematics, albeit less so in upper years. Perhaps what makes the perceptual difference between early- and later-year instructors even more profound is that the students present essentially the same cohesive views of mathematics across all undergraduate years. That is, the instructors' perceptual differences do not correspond to a difference presented by the students.

How the current work may be used to inform practice remains to be seen. It is likely that an instructors' perception of their students, including how they view the subject, informs what experiences the instructor provides the students. This may, in turn, make for tasks and assessments that conflict with how the students view the subject. For example, if an instructor believes their students hold fragmented, procedure-oriented conceptions of mathematics, they may think the students are not prepared for a conceptually-oriented task. This may be a missed opportunity, and such a disconnect can have profound implications for student development. When learning tasks are aligned with the skills and perspectives brought by the students, all students are capable of taking a deeper approach to learning (Biggs, 1999; Biggs & Tang, 2011).

It is well established that a component of effective education involves activating students' prior knowledge. The most successful education connects all new experiences to students' prior knowledge (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Ausubel, Novak, & Hanesian, 1978; Resnick, 1983). If an instructor's perception of their students' prior knowledge does not align with their actual prior knowledge, then this connection cannot be made. As Ambrose and colleagues (2010) identify, "...it is critical to assess the amount and nature of students' prior knowledge so that we can design our instruction appropriately." As it stands, it is not a common practice for instructors to assess their students' prior knowledge. Without such an assessment, an instructor is left to make assumptions about the composition and nature of students' prior knowledge. These assumptions may not be accurate, creating a disconnect between what is to be learned and what has been learned.

In university introductory mathematics courses, instructors are currently witnessing dramatic year-to-year differences in the prior mathematical experiences brought with students entering from high school. Primary and secondary math education focuses more and more on conceptual aspects of mathematics and downplays algorithms and calculations. These experiences shape how students view the subject. The shift in focus to concepts in primary and secondary school necessitates a corresponding shift to concepts in introductory university-level mathematics courses, which are currently often procedure-heavy service calculus courses. Without such a shift, the transition

from high school to the university—well documented as a chasm between university expectations and student abilities (De Guzman, Hodgson, Robert, & Villani, 1998)—will be all the more difficult, and student outcomes are likely to decline. Despite this need, first-year mathematics courses have remained largely static in their content and delivery over the last few decades. This disconnect between first-year instructors' expectations and entering students' abilities is exasperated by instructors' inaccurate perceptions of their students' views of mathematics (Engelbrecht et al., 2005). Instructors think there is a match between the procedure-heavy first-year curriculum and their, perceived to be, procedurally-minded students. Students who are less procedurally-minded under-perform in these courses, causing instructors to think of their students as having impoverished procedures. The instructor in a subsequent iteration of the course incorporates this experience by focusing further on procedures. All along, the focus is on fragmented conceptions of mathematics when it ought to be on cohesive conceptions.

This disconnect may not be unique to the high school/university transition. The results of this study indicate that a similar disconnect appears between the lower and upper years of the university. For mathematics there is a tangible difference between lower and upper year courses. Lower year courses are often service courses, and this is reflected in the curricula through an emphasis on procedures and applications. Few upper year courses are intended as service courses, and the curricula are more concept-focused. The ways these two types of curricula are enacted also differs substantially. Tasks and assessments given to first-year students typically involve solving large numbers of short, procedure-based problems. In upper-year courses the students are most commonly assessed on their understanding of theorems and how they might be applied. It is perhaps this difference in course emphasis that leads instructors to view their students differently.

The marked divide between lower- and upper-year instructors' perceptions is especially surprising given that upper-year students were once lower year students. Granted, a good portion of the students that hold fragmented conceptions leave the mathematics course streams after the first year to pursue their non-mathematics-oriented specializations. But, nonetheless, the underestimation by upper-year instructors of fragmented conceptions held by their students seems to suggest that instructors may assume the students that continue in mathematics are undergoing a shift in their conceptions of mathematics in their first two years. The data reported here indicates that such a shift may not be actually occurring. Indeed, procedure-heavy service courses may only serve to reinforce students' fragmented conceptions.

Of course, the above claims, though likely, need to be substantiated. Students' perspectives of their instructors, learning situations, subjects, etc., have all been extensively studied (Prosser & Trigwell, 1999). Instructors' perceptions of their students, on the other hand, seems to be an almost entirely unexplored domain. It is a potentially interesting and insightful domain, given the results of the current study.

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# Does LearnSmart Connect Students to Textbook Content in an Interpersonal Communication Course?: Assessing the Effectiveness of and Satisfaction with LearnSmart

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This study examines McGraw-Hill Higher Education's LearnSmart online textbook supplement and its effect on student exam performance in an interpersonal communication course. Students (N = 62) in two sections were either enrolled in a control group with no required LearnSmart usage or a treatment group with requisite LearnSmart assignments. Aggregated exam scores were compared using independent sample t tests. Results indicate that the control and treatment groups scored similarly on the exams with no significant differences; however, patterns of findings reflected a trend of higher scores in the treatment condition. Students utilized the tool primarily as a study aid and generally were satisfied with the online resource except for the perceived value. Suggestions for administration of the LearnSmart tool are provided.

According to a United States Government Accountability Office report (2005), advancements in computers and the Internet combined with increasing demands from educators have led to the proliferation of technology supplements provided by textbook publishers. These supplements can be found across a wide variety of domains, including social sciences like communication studies (e.g., Sellnow, Child, & Ahlfeldt, 2005), natural sciences like anatomy and physiology (Griff & Matter, 2013), and in business foundations like accounting (Johnson, Phillips, & Chase, 2009). Popular textbook publishers like McGraw-Hill, Bedford/St. Martin's, and Pearson sell access to technology supplements, often on top of the printed textbook price. Instructional textbook supplements range from DVDs to book companion websites containing multiple types of online learning resources (Sellnow et al., 2005). Informed by personal experiences, representatives for these publishing companies often use these technologies as selling points for their lines of textbooks. For instance, Pearson provides "Efficacy Implementation and Results" (2014) booklets and web brochures that contain numerous unpublished, non-peer reviewed case studies attesting to the benefits of their MyLab line of textbook technology supplements.

Although informative, these potentially biased studies lack the veracity of published, peer reviewed empirical studies of the effectiveness of these technologies. Therefore, as educators we must caution against making purchasing decisions based upon unsupported claims of improvement in student learning outcomes. It is then prudent to examine these claims to benefit students, educators, and publishing companies alike.

## Computer-Assisted Learning

Textbook technology supplements (TTS) are specific technologies in the larger category of computer-assisted learning. Meta-analyses across multiple disciplines show with consistency a positive influence of computer-assisted learning (CAL) technologies on student performance. Results are often most positive with respect to these technological resources increasing student performance when compared to traditional, non-supplemented learning (Timmerman & Kruepke, 2006). Lewis (2003), in a review of 10 CAL studies in the domain of anatomy and physiology, found support for positive benefits of these technologies on student performance and advocated their use (p. 206). In the context of anatomy and physiology courses, it was suggested that CAL technologies improve performance because they expose students to material in an alternative manner, they promote repeated exposure, and they increase practice in problem-solving. These gains, Lewis speculated, provide benefits to students and educators in that they increase satisfaction with the learning process.

Timmerman and Kruepke (2006) reviewed 118 CAL studies and indicated a Cohen's d effect size of .24 standard deviations higher in CAL students' performance than traditional students. The authors declared that CAL technologies were associated with "a reasonable level of improvement in performance when compared to traditional instruction" (p. 91). They investigated moderators like the domain of study, the time of study publication, and multiple media richness constructs. The high number of moderating variables cloud understanding how these technologies actually improve student learning outcomes as these variables potentially inhibit CAL performance (p. 94).

Though the previously mentioned meta-analyses show a small, positive effect of CAL on student performance, the authors also noted that findings are inconsistent across the cross-sectional studies selected for inclusion. The broad range of technological options causes frustration when trying to identify concrete effects of technological supplements *in toto* (Littlejohn,

Falconer, & Mcgill, 2008). For instance, studies included in Timmerman and Kruepke (2006) assessed CAL technologies of many forms: e-texts, online practice quizzes, interactive discussion boards, and/or videos and other hypermedia enhancements. These varying online resources have potentially incongruous influences on student performance, making it difficult to make general claims about the influence of CAL resources on student learning (Littlejohn et al., 2008). It is also difficult to draw specific conclusions about the effectiveness of one particular type of technology. When discussing future directions for research in an article about textbook supplements in communication studies courses, Sellnow et al. (2005) recommend researchers consider, "Are some technology supplements better equipped to foster intellectual growth than others?" (p. 250). To answer this question and develop a more complete understanding of the benefits and pitfalls of a singular online tool, it is proper to evaluate TTS technologies separately. Thus, one specific TTS technology, LearnSmart, is being investigated to provide targeted information for students, educators, and publishers with an interest in the effectiveness of this individual resource.

## LearnSmart: Overview and Findings

LearnSmart is one tool available from the wider collection of online resources available in the Connect package offered by McGraw-Hill Higher Education Publishing Company (MGHHE). Connect is a TTS available across multiple disciplines, and within Connect are multiple resources. For communication studies, the Connect package includes assignments like quizzes and practice tests, access to an e-book edition of the textbook (for additional purchase), media resources for instructors, and the LearnSmart tool. Currently, student access to the Connect TTS can be purchased in addition to a printed textbook for approximately $50 USD, or access to Connect in combination with an electronic copy of the textbook can be purchased for $75 (no hard copy text included).

LearnSmart is marketed by MGHHE as an "adaptive technology," an interactive study tool that dynamically assesses students' skill and knowledge levels to track the topics students have mastered and those that require further instruction and practice (MGHHE, 2013a, p. 1). Griff and Matter (2013) assessed the tool's effectiveness in introductory anatomy and physiology courses and described how the LearnSmart resource works:

> For each question in a LearnSmart session, the student first decides his or her confidence level in answering that question, from "yes," "probably" or "maybe" (I know the answer) to "just a guess." Some questions are multiple choice, some are multiple answer (where more than one choice is correct) and some are fill-in-the-blank. The software uses the student's understanding of the material from previous questions and the student's confidence to select subsequent questions. (p. 171)

Resulting information about student progress allows the system to adjust or "adapt" the learning content based on knowledge strengths and weaknesses, as well as student confidence level about that knowledge (MGHHE, 2013a). Educators can access a host of reports documenting overall class progress and areas for additional reinforcement, offering them the ability to instantly evaluate the level of understanding and mastery for an entire class or an individual student at any time. If practiced as intended, then instructors could craft lectures and class discussions toward areas where students lacked comprehension and where certainty is low. Ideally, students and instructors might benefit from adoption of the LearnSmart technology (MGHHE, 2013b).

A primary benefit of student LearnSmart usage advocated by MGHHE is greater learning efficiency, as demonstrated in the numerous case studies they provide on their website (MGHHE, 2013a). Learning efficiency is the degree to which a TTS tool can help reduce overall study time or maximize gain in students' already limited study time. Theoretically, students are better able to understand areas of proficiency and deficiency through the LearnSmart tool (MGHHE, 2013a, p. 4). As a result, it can pinpoint students' knowledge gaps helping to direct their attention and study time where it is needed, therefore allowing for a more focused study plan. Better focus, they claim, is realized and manifested through increased student performance. Although the MGHHE LearnSmart website offers results of case studies that support claims regarding this benefit (e.g., MGHHE, 2013b), relatively few unbiased, published studies document the influence of LearnSmart on student performance.

In one such study, Griff and Matter (2013) evaluated the LearnSmart system in an experimental, treatment-control comparison study that spanned six schools and included 587 students enrolled in an introductory anatomy and physiology course. Scores on posttests were compared with pretests between treatment sections ($N$ = 264) that had access to LearnSmart modules and control sections ($N$ = 323) that did not. Overall, LearnSmart had no significant effect on improvement compared with the control section, although two of the participating schools did demonstrate significantly greater improvement in treatment versus control sections. Regarding the positive influence for these schools, authors hinted at a spurious relationship extending from instructors at these

schools following the textbook more closely, thereby eliciting a better match between LearnSmart and exam content. As imagined, countless variables can influence student performance, thus contributing to the complexity of identifying a true effect of TTS and CAL technologies on performance (Griff & Matter, 2013, p. 176). Potentially, instructors and students did not use LearnSmart as recommended.

Additionally, Gurung (2015) compared effectiveness of three separate TTS offerings across three semesters of an introductory psychology course. In investigating the relationship between the amount of time spent using LearnSmart and student exam performance, the authors identified a significant, positive correlation such that the more time students spent with the LearnSmart modules the higher they scored on exams (average $r$ = .17). Potentially, as described in Lewis' (2003) meta-analysis of CAL technologies, more time with the tool inevitably relates to greater exposure to the material.

Given what is reported in extant CAL literature along with the works of researchers Griff and Matter (2013) and Gurung (2015), the following hypotheses are presented:

*H1a*: Students in the treatment group have higher exam scores than students in control group.
*H1b*: Students in the treatment group have higher textbook-only scores than students in control group.
*H2*: More time spent using LearnSmart relates to higher exam scores.

Additionally, two exploratory research questions are posed as well:

*RQ1*: How do students use the LearnSmart tool?
*RQ2*: What are student perceptions of the LearnSmart tool?

## Method

This study utilized a group comparison, posttest-only experimental design wherein two groups (control and treatment) were compared for the effect of LearnSmart usage on student exam performance. All procedures for this study were approved by the appropriate Institutional Review Board.

### Participants

Participants ($N$ = 62) included students enrolled in two sections of an interpersonal communication class during the Spring 2014 semester at a mid-size university in the southwest United States. Enrolled students were not informed of the study procedures, nor did they know in which group they were participating. As a consequence, intergroup communication was not restricted. It is possible students in the control group may have been exposed to the treatment; however, students in the control group did not indicate awareness of, or make requests for, LearnSmart requirements or assignments. The courses were taught consecutively on the same day by the same instructor in the same room and with identical content being covered. From the two sections, one class served as a control group ($n$ = 33) where no LearnSmart modules were required or provided for students. In the treatment group ($n$ = 29), access to the LearnSmart online resource was a requisite course material, and students were expected to purchase their own access. No assistance or feedback from MGHHE was solicited for this study.

The two groups were compared across several demographic characteristics including sex, classification/year, program of study (majors versus nonmajors), average number of absences per student during the semester, and average institutional GPA of students' prior to the semester. Data regarding the composition of the groups can be found in Table 1. Shown in this table, the groups have similar numbers of males and females as well as similar average GPA. An independent sample $t$ test comparing average class GPA between the control and treatment groups was not statistically significant, $t$ (53) = -.64, $p$ = .52, $d$ = .17. Equivalent GPAs between the groups is necessary given that GPA is found to be a predictor of student performance (Cheung & Kan, 2002; Gurung, 2015). The groups differ in classification (the control group had more seniors than juniors, whereas treatment group had more juniors than seniors), in program of study (the control group had nearly three times more communication studies majors than the treatment group), and absences (the treatment group had more average absences per student). An independent sample $t$ test comparing means between the control and treatment groups regarding absences was statistically significant, $t$ (60) = -2.45, $p$ = .02, $d$ = .58.

### Procedures

In the control group, students completed online quizzes for each chapter (a total of nine quizzes worth 10 points each), as well as a bonus quiz for posting a personal profile on the course Blackboard site (for a full 100 points toward the final course grade). In the treatment group, students completed LearnSmart modules for each of the nine chapters. Like quizzes in the control group, these LearnSmart modules were a part of the students' final course grade. They were graded for completion to compel students to use the LearnSmart tool based upon previous recommendation (Sellnow et al., 2005, p. 251). Chapter modules were worth 10 points each for 90 points (with a 10-point registration grade for 100 possible LearnSmart points).

Table 1
*Comparison of Class Demographics*

| Variable | Control | Treatment |
|---|---|---|
| N | 33 | 29 |
| Sex | | |
| Male | 9 | 7 |
| Female | 24 | 22 |
| Program of Study | | |
| Major | 16 | 6 |
| Non-major | 17 | 23 |
| Classification/Year | | |
| Sophomore | 1 | 3 |
| Junior | 13 | 19 |
| Senior | 19 | 7 |
| Absences M (SD) | 1.81 (1.78) | 2.90 (1.68) |
| GPA M (SD) | 2.81 (.47) | 2.90 (.58) |

*Note.* [a]Significant difference at $p = .02$.

At the start of a new content area, LearnSmart modules for the treatment group and quizzes for the control group were opened for each of the three chapters covered for the area. Modules did not close and quizzes were not graded until immediately prior to the content area exam. This allowed students to use the respective tool to prepare for lectures, to develop further understanding or improve comprehension, and/or to review past material. It was not requisite that students completed a module before chapter content was covered. Unfettered access provides the opportunity for students to use the LearnSmart tool (and quizzes) in multiple ways both in terms of frequency (several attempts) and function (studying, preparing, etc.), and it allows examination of how the students voluntarily use the tool. Although access to chapter LearnSmart modules and quizzes was unlimited, only the first full attempt counted toward the final course grade.

Within LearnSmart, instructors can select the amount of content for each chapter they want to deliver to students by moving a slider for more or less content. The tool provides an approximate time length for full completion of the module. Previously, students perceived the LearnSmart technology to be "time consuming" (Griff & Matter, 2013), therefore modules for the treatment group were limited to 25 minutes. Completion times ranged from six to 73 minutes ($M$ = 21.20; $SD$ = 10.98), and the average time students spent with the LearnSmart technology over the semester was 190.86 minutes ($SD$ = 98.86).

To gauge student performance, both groups completed three exams throughout the semester. Each exam covered three content chapters via 40 multiple choice questions. Griff and Matter (2013) speculated that LearnSmart modules would be most beneficial for helping students understand the textbook content rather than any outside materials/content an instructor may bring in to the course. As such, exam questions were classified into two categories: items concerning material discussed in lecture (and presented in the text) or material assigned from the textbook but not discussed in class (textbook-only). Approximately 20% of exam material (eight questions) came from the textbook-only category. Total exam scores were averaged for each student to determine an overall performance score. Second, textbook-only questions were scored for each exam and were aggregated across the three exams for a textbook-only performance score. Information regarding exam scores can be found in Table 2, and a histogram of aggregate scores is provided in Figure 1.

After the semester, students in the treatment group were asked to participate in a survey to ascertain their perceptions of the LearnSmart tool. Students evaluated the online resource with respect to the perceived value, ease of use, habits and tendencies, and satisfaction with the supplement. Students were not required to participate in the survey and were not rewarded/penalized for completing/not completing it. Students provided unique identifiers in class that were any combination of words, numbers, or symbols, and the survey prompted participants to provide their unique identification code to pair responses with course performance.

## Measures

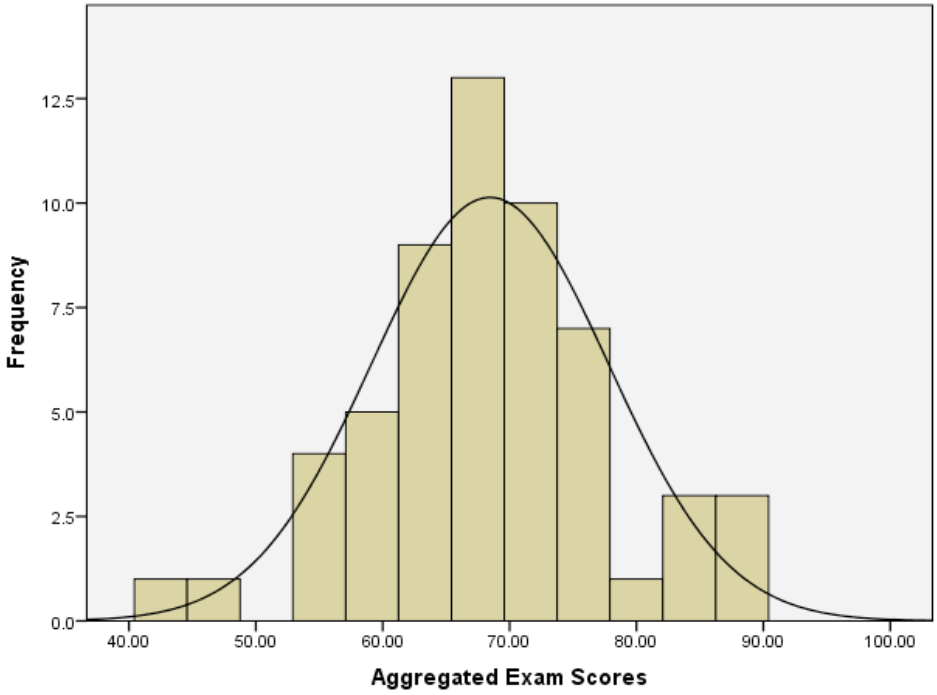
**Students' perceptions.** All survey items to examine student perceptions of LearnSmart were

Table 2
*Total Exam and Textbook-Only Performance Comparison*

| Group | Exam Score | SD | Textbook Only | SD |
|---|---|---|---|---|
| Control | 27.04 (68%) | 3.75 | 5.57 (70%) | 1.16 |
| Treatment | 27.75 (69%) | 3.77 | 6.14 (77%) | 1.14 |

*Note.* No differences statistically significant at $p < .05$.

Figure 1
*Histogram of Aggregated Exam Scores for Both Groups*




created exclusively for use in this study. Response scaling ranged from 1 = *Strongly Disagree* to 5 = *Strongly Agree.* Thirty questions covered four general categories of perceptions: Satisfaction, Utility, Usability, and Perceived Value. Satisfaction concerns whether the tool generally met the needs of the student and is indicated by items such as, "I am very satisfied with LearnSmart." Utility relates to how students used the technology and includes three sub-scales: Understanding, Preparation, and Studying. Understanding reflects the degree to which students thought LearnSmart helped them to better comprehend material ("I was encouraged to rethink my understanding of some aspects of the subject matter"). Preparation measures the students' use of LearnSmart to introduce course content before discussions and lectures ("I used LearnSmart to cover course content before it was discussed in class"), whereas Studying assesses the use of the technology to review for exams ("LearnSmart was mainly a tool for review and studying past material"). Usability gauges student perceptions about access and user-friendliness, for example, "LearnSmart allowed me to access online/digital learning resources readily." Perceived Value indicates student beliefs about the quality of the tool, with items like, "The CONNECT package was worth the cost."

A total of 20 students from the treatment group completed the survey. Internal consistency was estimated for each of the scales via Cronbach's alpha: Satisfaction ($n$ = 5; α = .87; avg. $r$ = .41; $M$ = 3.69; $SD$ = 1.03), Understanding ($n$ = 4; α = .66; avg. $r$ = .34; $M$ = 3.87; $SD$ = .72), Preparation ($n$ = 4; α = .87; avg. $r$ = .64; $M$ = 3.36; $SD$ = .99), Studying ($n$ = 4; α = .73; avg. $r$ = .42; $M$ = 4.16; $SD$ = .60), Usability ($n$ = 9; α = .87; avg. $r$ = .46; $M$ = 4.05; $SD$ = .66), and Perceived Value

($n$ = 4; α = .91; avg. $r$ = .73; $M$ = 2.91; $SD$ = 1.32). Most scales achieved adequate internal consistency estimates (α ≥ .70) except for Understanding.

**Hypothesis testing.** G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) was utilized to determine achieved power to detect differences between the two independent sample means. Given sample sizes of 33 for the control group and 29 for the treatment group, power to detect small effects (.20) is .19, medium effects (.50) is .61, and large effects (.80) is .92.

H1a predicted the treatment group would score higher on exams than the control group. Independent sample $t$ tests compared aggregated exam scores to test the hypothesis. Results failed to identify significant differences between the control and treatment groups with respect to exam performance, $t$ (55) = -.71, $p$ = .48, $d$ = .19. Findings indicate the control group ($M$ = 27.04; $SD$ = 3.75) and the treatment group ($M$ = 27.75; $SD$ = 3.77) performed similarly on exams, thus failing to support the hypothesis.

H1b predicted that the treatment group would score higher on textbook-only exam content than the control group. Independent sample $t$ tests compared aggregated textbook-only performance to test the hypothesis. Results again failed to identify significant differences between the control and treatment groups at the $p < .05$ criterion, $t$ (52) = -1.82, $p$ = .08, $d$ = .50. Findings indicate the control group ($M$ = 5.57; $SD$ = 1.16) and the treatment group ($M$ = 6.14; $SD$ = 1.14) performed similarly on textbook-only exam content. Because the test is nearing statistical significance, there appears to be a moderate effect for the treatment group indicating higher scores on textbook-only exam content. Yet power to detect a significant difference was only .61 for a moderate effect in the current sample; therefore, the study was likely underpowered to detect a significant relationship. It is possible that if the sample size were increased, then difference between group scores on textbook-only content could become significant.

H3 predicted that students who spent more time using LearnSmart would score higher on exams. This prediction was not supported by a bivariate correlations between time spent on LearnSmart modules and exam scores, $r$ = -.53 ($p < .01$), nor textbook-only scores, r = -.46, $p$ = .02. In fact, the association identified in this study was counter to what was predicted and to the findings of Gurung (2015); however, they were in line with findings of Griff and Matter (2013).

To further investigate this paradox, a one-way analysis of variance test was utilized to determine time differences between students of various course grades. That is, students were grouped according to their final course grade (A, B, C, or D) and then compared for their time spent with the tool. Results of the one-way ANOVA were not significant, suggesting no differences between the groups, $F$ [3, 24] = .66, $p$ = .59. However, the visual plot of means (see Figure 2) presents an interesting curvilinear pattern demonstrating students who performed the best (A) and worst (D) in the class spent the least amount of time with the technology compared to average students (B and C). Interestingly, A students spent the least amount of total time completing LearnSmart modules ($M$ = 152.50, $SD$ = 49.74).

This indicates that the less amount of time spent with LearnSmart, the better students performed on exams. Admittedly, once a module is started, the time counter runs regardless if students take restroom breaks, talk or text on the phone, make food or drinks, or cruise the Internet while doing a module. Actions such as these could inflate actual time spent using the tool as well as decrease the effectiveness because attention is distracted. It could be those who completed modules without distractions not only finished quicker but also received more benefits.

**Research questions.** RQ1 probed how students in the treatment group used LearnSmart modules. Examination of scale means between Studying and Preparation scales provided support for this hypothesis. Students reported using LearnSmart more as a tool for studying past material rather than for comprehension of, or preparation for content. The mean for Studying ($M$ = 4.16; $SD$ = .60) was higher than either Preparation ($M$ = 3.36; $SD$ = .99) or Understanding ($M$ = 3.87; $SD$ = .72).

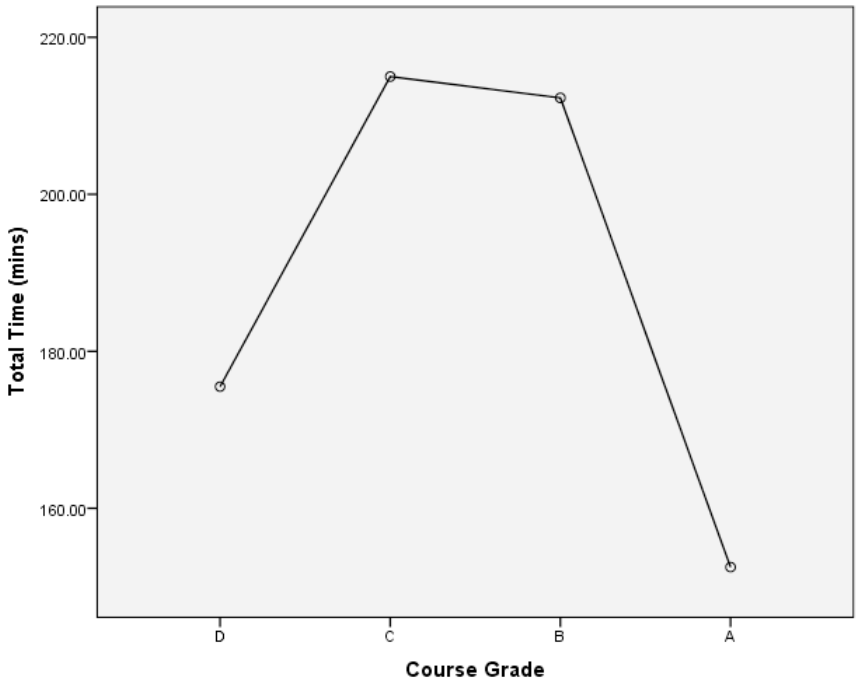
RQ2 questioned student responses regarding perceptions of the LearnSmart tool. First, on average students agreed they were satisfied with the tool ($M$ = 3.69; $SD$ = 1.03) and found it easy to use ($M$ = 4.05; $SD$ = .66). Next, however, students did not agree that the tool was of high value ($M$ = 2.91; $SD$ = 1.32). Perceived value had the lowest average agreement of all the measured dimensions and was the only scale <3.00 (the response scaling midpoint).

## Discussion

This study investigated the effect of MGHHE's LearnSmart on student exam performance, as well as student usage and perceptions of the resource. Foremost, results indicate that students in the treatment group who completed LearnSmart modules scored similarly to students in the control group on overall exam performance, as well as textbook-only performance. Second, time spent using LearnSmart was negatively related to exam scores. Third, students were more likely to use the LearnSmart tool as a study aid rather than for increasing comprehension or preparing for lectures. Although students were satisfied with the resource and found it easy to use, they did not agree that LearnSmart was of great value to them.

Similar to Griff and Matter's LearnSmart study (2013), results of this study found no statistically

Figure 2
*One-Way ANOVA, Time Spent with LearnSmart by Overall Course Grade*




significant influence of LearnSmart on student exam performance. However, regarding textbook-only exam content, the difference between the control and treatment groups was near statistical significance ($p$ = .08); given the small sample size of this study, it is possible that a relationship would become significant if the study were of higher power to detect differences (i.e., larger sample size). Exam scores between the groups did not differ significantly, but the pattern of results hints at a positive influence of LearnSmart on exam performance; however, the magnitude of effect (especially with respect to the total exam scores) seems to be small to moderate. Future studies may be interested in larger comparison groups to determine a more accurate picture of the relationship and effect of LearnSmart on exam performance.

Although no significant gains in student performance were realized, it may be possible that usage of LearnSmart mitigated the negative effects of certain deficient characteristics of the treatment group. When considering the composition and habits of the two groups, it is plausible that the effect for LearnSmart was actually greater than the data indicate. For instance, as compared to the control group, the treatment group was younger (had fewer seniors and more juniors than the control group), had fewer communication studies majors (therefore potentially less prior exposure to course content), and had significantly more absences. It might be that LearnSmart was able to lessen the negative effect that a variable like absences might have on exam performance by helping keep students actively engaged with course content. It is equally plausible that group differences posed potential confounding variables, thus negatively affecting the acceptance of findings presented here.

Results also show that students are more likely to use LearnSmart for exam review rather than preparing for class. This is not unusual as textbook supplements in the discipline of communication studies are perceived by students primarily as study aids (Sellnow et al., 2005). Thus, the preparatory function that LearnSmart can serve was underutilized in the current study because modules were not required to be completed prior to in-class coverage. Ideally, as suggested by MGHHE (2013a), when completed prior to lecture, this supplement helps students come to class with a solid foundation of concepts that will be covered to help them direct their attention during lectures to areas of deficiency. Theoretically, students could pay closer attention to areas in which they are uncertain and could prepare questions about these areas to aid comprehension. For instructors, requiring completion

of LearnSmart modules prior to lecture could help to direct lecture material toward areas where students are struggling. Future studies might be interested in comparing how the preparation function might influence student exam performance as compared to the sole use of LearnSmart for reviewing exam material.

There are also other benefits that using LearnSmart can provide that were not examined here. For instance, teaching effectiveness as a benefit centers upon student engagement with the material in the classroom through increased discussion and "higher-level question asking" (MGHHE, 2013a, p. 5). MCHHE declares that students who complete modules before class content is deployed are "more knowledgeable about core course content and, as a result, are more engaged in classroom discussion and participation" (2013, p. 5). Assumedly, introduction to course material via LearnSmart prior to engagement with material in the class spurs interest and motivation during class time. Future research might consider ways to measure and evaluate student engagement in the classroom, potentially through self-report surveys or qualitative observations.

Significant improvements in performance were not realized, but students tended to be satisfied with the tool. Survey responses indicated that students agree they are "very satisfied" with the textbook supplement, and in particular students reported it being user-friendly. Whereas students in the Griff and Matter (2013) study complained that the modules were too time consuming, students in this study found the amount of work to be appropriate. One recommendation for instructors, then, might be that LearnSmart modules should take about 30 minutes for students to complete, and anything more might cause attrition. Arguably, what is important is that students are spending extra time with course material when using LearnSmart, which is related to CAL benefits of repeated exposure suggested by Lewis (2003). Overall, it is important to find the right balance of time for each module with too much or too little completion time likely being ineffective.

Despite self-reports of being satisfied with the tool, students disagreed that the textbook supplement was "worth the cost" ($M$ = 2.78, $SD$ = 1.52). Ranging from $50 to $75 USD, the supplement was not deemed valuable at those prices. However, it is my experience that students generally balk at textbook costs regardless of what satisfaction or effectiveness they perceive/receive.

Limitations abound in the scholarship of teaching and learning, notably the difficulty in identifying how a tool like LearnSmart might differentially impact the diverse educational environments across all of higher education (Griff & Matter, 2013). As mentioned by Griff and Matter (2013), "there are many variables in a study of this type" (p. 176) that might have an influence on student performance. Although researchers might discover general patterns of effectiveness, as evident in this study it still remains unclear why or how much the LearnSmart textbook supplement and others like it impact student learning. There still remain many unexamined and hidden variables that play a role in student performance, not to mention individual differences in motivation (Ames & Archer, 1988), perceptions of technology (Koohang, 1989; Muilenburg & Berge, 2005), and even life circumstances like depression or anxiety (Furr, Westefeld, McConnell, & Jenkins, 2001). There are also limitations specific to the current study including small sample size, cross-sectional design, potential for cross-group contamination, spurious differences between groups, a singular focus on student exam performance, and use of previously untested measures.

## Conclusion

This study examined the effectiveness of McGraw-Hill's LearnSmart textbook supplement technology on student performance in an interpersonal communication class. Findings indicate that exam performance is not significantly improved for students using the online resource; however, results do demonstrate a trend of positive effects for the treatment group. Students largely used the tool as a study aid and were generally satisfied with the resource except for the cost-to-benefit value.

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# Whose Job Is It? Exploring Subject Tutor Roles in Addressing Students' Academic Writing Via Essay Feedback

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Strong arguments have been forwarded for embedding academic writing development into the UK higher education curriculum and for subject tutors to facilitate this development (Hyland, 2000; Lea & Street, 2006; Monroe, 2003; Wingate, 2006). This small-scale case study explores subject tutors' practices and beliefs with regard to the provision of feedback on aspects of student teachers' academic writing. Data are derived from a content analysis of student essays and associated tutor feedback, along with semi-structured interviews with faculty of education tutors in a new university. Findings, presented within Bourdieu's framework (cited in Shay, 2005) for understanding shared and varied practice, indicate that although there is consensus on the importance of academic literacy, variations in tutors' knowledge and positions lead to variations in practice with regard to how much feedback is given, on what, and how. Questions are raised about quality and standards and implications for best practices are discussed.

There continues to exist within UK higher education (HE) an interest in, and concern for, students' academic writing. It began with a general uneasy feeling that standards were in decline (Davies, Swinburne & Williams, 2006; Lillis & Scott, 2007), which was increasingly attributed to widening participation agendas and the subsequent diversification of entrants into HE. This sense of unease soon gave way to a sense of responsibility as universities started to recognize the necessity to teach academic writing. Subsequently, literature on academic literacy and academic writing, in particular, has flourished (see Ganobcsik-Williams, 2006), exemplifying a range of theories, models, and methods.

Traditionally, the model within the UK has been an English for Academic Purposes (EAP) one aimed at non-native speakers of English only. Provision has taken the form of mostly generic, sometimes subject-specific, academic skills development classes prior to and/or during students' degree programs. The discourse that has tended to accompany and justify this model has been one of "deficit" (Lea & Street, 1998; Lillis, 2002), i.e., international students lack language proficiency and knowledge of UK academic conventions. However, this model is becoming increasingly difficult to justify. This is not only due to the changing profile of the student population, (e.g., an increase in non-native speaker home students), but also the growing appreciation of the different, yet equally valuable, types of capital which international students possess (e.g., social and cultural). Hence, this model of support has been challenged, and so too has the discourse surrounding it.

Supplanting it is a discourse of inclusivity, supported by an *academic literacies* view that any student transitioning from a secondary to tertiary education, whether a native or non-native speaker, needs to draw on both a range of literacies and an understanding of the meaning-making and identities associated with each in order to be successful in HE (Lea & Street, 2006; Wingate, 2006). This perspective builds on foregoing academic literacy perspectives and models: (a) the *study skills* model (similar to the EAP model), which characterizes academic writing skills as generic and transferable and treats them as an add-on to the core curriculum that is typically delivered by centralized service staff (Wingate, 2006), and (b) the *academic socialization* model, which seeks to induct students into the academic community of practice through a process of engagement with the discourses that exist already and remain largely uncontested within the community (Lea & Street, 2006).

Where the academic literacies perspective goes further than the two previous ones, though, is in its challenge of the status quo. Students are not viewed as empty vessels that need filling; nor are they viewed as apprentices who need to learn the rules of the game. Instead, students are viewed as active participants in the negotiation and creation of meaning. As such, they are involved in the complex power relationships that exist within, but also structure, dominant discourses (Lillis, 2002; Lea & Street, 2006). The academic literacies perspective, therefore, seeks to give students a voice by advocating a dialogic approach to the development of academic literacies, one which encourages questioning and challenging the conventions that both characterize and bind the world of academia.

It also recognizes the range of literacies required by students, particularly in increasingly modularized programs of study. Each module and, indeed, assessment type within each module may well require a different genre and mode of meaning-making (Hyland, 2000; Lea & Street, 2006). It is for this reason, and for the reason that epistemology and writing are intricately intertwined (Somerville & Crème, 2005), that those supporting an academic literacies view advocate

embedding academic literacy into the curriculum, to be nurtured by module tutors, i.e., subject specialists who are themselves, it is assumed, fully conversant with the discourse practices within their academic communities of practice and who are best placed to explore the literacy requirements of their subject and of their assignments (Monroe, 2003).

To recap, there is a growing consensus in the UK that a good standard of academic writing is more than just desirable: it is crucial for engaging with and learning one's subject, including for contesting and constructing knowledge, for progression, and ultimately for academic achievement and recognition (Hyland, 2013a). There have also been strong arguments put forward for embedding academic writing into the curriculum (Hyland, 2000; Haggis, 2006; Wingate, 2006) and, although examples of good practice in the UK context are still limited, case studies describing and evaluating embedded writing initiatives are emerging (Hunter & Tse, 2013; Wingate, Andon & Congo, 2011; Wingate & Dreiss, 2009; Wingate & Winch, 2010; see also the "Thinking Writing" Project at Queen Mary, University of London, and initiatives developed in the "Write Now" Centre of Excellence in Teaching and Learning at London Metropolitan University).

This momentum towards an embedded academic literacies approach aligns perfectly well with the shift in thinking around assessment from "*of*" learning to "*for*" and "*as*" learning. The last two prepositions are associated with such practices as the provision of on-going formative and dialogic feedback, feed *forward,* in-class engagement with marking criteria and exemplars, and peer- and self-evaluation, all of which reflect a desire to empower learners, not only through an increased understanding of the complexity of marking itself, but also through the development of the capacity to make informed and 'insider' judgments about the quality of one's work (Boud, 2000; Dearing, 1997; Dochy, Segers & Sluismans, 1999; Sadler, 1998; Taras, 2002).

## The Purpose of This Study

It is the intersection in the literature between academic literacies and assessment *for* learning in which this piece of research is situated. The importance of feedback to student writers is, according to Hyatt (2005, citing Ivanic, 1998; Benesch, 2000; Hyland & Tse, 2004), "well documented" within academic literacy literature (p. 339). A relatively recent case study conducted by Wingate and colleagues (2011) shows assessment feedback to be a "highly effective method" of writing instruction (p. 77). Our own research (Court, 2014) corroborates this. Yet we also know that subject tutors may be reluctant to address issues of academic writing (Mitchell & Evison, 2006) and may have difficulty translating "tacit" knowledge into explicit guidelines (Higgins, Hartley & Skelton, 2002; Jacobs, 2005; Lea & Street, 2000; Murray, 2006). A further review of the literature reveals that practices and underlying beliefs regarding feedback can vary among tutors both within and across subject disciplines (Read, Francis & Robson, 2005; Smeby, 1996) and are conditioned by a number of factors: institutional requirements, time constraints, and work pressures (Bailey & Garner, 2010; Nicol, 2010; Tuck, 2012); linguistic background and professional experience (Santos, 1988; Weigle, 1999); ideas of what constitutes good writing, albeit tacit ones in some cases (Elbow, 2006; Hyland, 2013b; Lea & Street, 2000; Nesi & Gardner, 2006); and personal preference (Bloxham & Boyd, 2012; Hyland, 2013b). With regard to this particular article, Hyland's research (2013c) is the most salient, despite being conducted with English as a second language writers and their subject tutors. His findings indicate that tutors are more concerned with meaning-making than they are with grammatical accuracy. However, the feedback tutors provide does not necessarily support students in expressing themselves according to discipline-specific conventions and discourse practices.

Given that subject tutors may not want to develop students' academic writing, and given that they seem to vary in their beliefs about what good writing is and how their knowledge and beliefs should be enacted through feedback, calls for embedded, tutor-led writing instruction need to be answered with situated research. In other words, faculties need to determine whether subject tutors are, indeed, the ones best equipped to take on this role. This article fulfills this requirement by reporting the findings of a small-scale case study involving mixed research methods, of five subject tutors within a new university's Faculty of Education and their provision of feedback on student teachers' writing. The specific research questions are:

- How much feedback do tutors offer on aspects of academic writing?
- What aspects of academic writing do tutors comment on?
- What are the reasons for tutors' feedback practices?

This study starts from the assumption that developing the academic literacy of student teachers who are training as primary teachers either at the undergraduate or postgraduate level (e.g., those earning a BA with Honors in Primary Education with Qualified Teacher's Status or QTS and those earning a Post Graduate Certificate in Education or PGCE), is especially important because language, genre, and discourse awareness are essential for the teaching of writing, an invariable part of any primary teacher's job. Therefore, situating this research within a Faculty of Education in order to learn about current practices and tutors' beliefs towards academic writing development provides useful baseline information on which policy makers can make important decisions about how best to develop students' academic writing in the future.

## Methods

### Participants

Once ethical clearance for the research project was obtained from the University, a faculty global e-mail was sent making polite requests for tutor participants in a study exploring written feedback practices. Five tutors responded positively, three of whom gave us access to their Virtual Learning Environment (VLE) sites, i.e., Blackboard, on which student essays could be accessed via Turnitin (plagiarism detection software), and two of whom gave us paper copies of essays and their feedback. The subject tutor markers all had at least ten years of experience lecturing and marking within primary education in an HE context and between 2-19 years within this specific Faculty of Education. While the tutors' job descriptions include marking students' work and providing feedback, there are no University regulations stipulating the amount of feedback, nor is there a requirement to mark/comment on students' standard of English. There has, however, been a drive to improve the timeliness and quality of feedback in response to relatively low National Student Survey scores in the assessment and feedback category. Tutors are acutely aware of the need to provide "prompt," "detailed" and "clear" comments, as there are three feedback-related questions on all programme evaluation forms completed by students.

Two essays from each tutor (10 in total) were chosen for the purposes of this case study. All essays were related to primary education, and all had the same module code prefix, indicating a general education module as opposed to a specialty; in this case, all essays were related to the learner and/or learning. Where more than two essays were offered per tutor, essays were chosen at random from those with the same module code prefix. All the essays were produced by British students, and all were either first-year essays or the first essay written within the first semester of a PGCE. Year one or first semester students were targeted because we were trying to capture essays which would reflect the maximum input from the tutor, and so we accepted the first piece of work from a student group or the first piece of work set by a tutor new to the students or the first piece of work produced in a subject area never studied before by the student. Our assumption was that if academic writing feedback was being given, then it would most likely be given early on in the students' programs and/or in their academic relationship with their tutors.

We sought permission from the students to look at their essays, along with the feedback they received, and obtained their consent to be interviewed. The interview data with students, although not reported on herein, represents the second stage of this project and will contribute to a follow-up article. Students were assured that we were looking at their tutors' feedback rather than at their work per se but were offered some additional, retrospective feedback on their writing in return for their involvement in the research project.

### Numerical Data

Content analysis was used by the authors to count and then categorize all instances of academic writing "errors" in each of the essays. Every occurrence of an error was counted not because we advocate this practice ourselves, but because we needed consistency and a base from which to make comparisons with the tutors' marking. For the purpose of this research, an "error" was defined as a linguistic inaccuracy judged against a standard variety of British English appropriate for the academic essay genre and/or any deviation from the academic and discoursal conventions governing this same genre within the subject area of primary education. Thus, we were initially identifying anything related to syntax, lexis, spelling, punctuation, sentence construction, layout, essay structure, paragraphing, academic discourse (e.g. coherence/cohesion), style, register, and referencing.

The authors looked at one essay together to identify errors, discuss error type, and devise categories for classification purposes. In devising our categories, we drew on the work of Wingate (2006) and Hyatt (2005). Wingate (2006) identifies two levels of learning involved in producing academic texts: the *techniques* level, which represents surface-level features such as spelling, grammar, cohesion, structure, citation, and style, and the *understanding* level, which involves "understanding the nature of knowledge and how it is constructed" (p. 462). Hyatt (2005) carried out a corpus analysis of the feedback given on sixty Master's level essays and identified seven categories based on the function of the feedback, two of which we deemed particularly useful for our purposes—*Stylistic Comments* and *Structural Comments*—both of which mapped neatly onto Wingate's *techniques* level.

A large number of low-level categories primarily associating academic writing with *techniques* formed the basis of our first independent essay coding. During our first standardization session, in which we came together to compare our coding and refine our categories, we acknowledged the difficulty of teasing out issues of academic writing from epistemology, i.e., the deeper levels of *understanding* referred to by Wingate, and as a result, we decided to use the higher-order category "Genre" to capture all those features that mark the academic essay as distinct from other genres. This included not just issues of style and structure, but also issues related to the rhetorical processes in academic discourse and the language devices used to express them (e.g., mitigating claims or hedging).

Referencing was another gray category crossing both the *techniques* level (e.g., accurate citation) and the *understanding* level (e.g., using a citation as support for a claim); being selective in terms of quality of source and currentness. However, in our marking of the students' work we noticed that tutors were giving a relatively high number of comments relating to referencing (at both levels), which indicated to us that referencing should constitute its own category to reflect the special status that tutors seemed to bestow upon it.

A second independent marking of one essay each was followed by another standardization session. Once we had achieved a high level of consistency in our coding, we then applied the following categorization system to the remaining five essays, one from each tutor marker: Genre, Referencing, Lexis, Syntax, Sentence Construction and Punctuation (See Appendix for definitions and examples).

**Numerical Data Analysis**

Tutors' comments (defined loosely as any mark on the text indicating a problem, from circles / underlines / exclamation marks to full explanations) on each of the five essays were categorized and counted and then compared with the research team's marking in order to establish the percentage and type of errors actually commented on by tutors. It is the detailed analysis of the quantity of tutor comments within and across these categories which forms the numerical element of this research.

**Narrative Data**

The narrative element consists of the academic subject tutor interviews. A pilot interview with a non-participant tutor in the faculty was conducted to ensure questions were clear and valid, as well as that the five categories established above were sufficiently and clearly exemplified by actual student errors. This last adjustment was especially important to ensure that interviewees could relate to, and talk around, concrete examples rather than abstract notions of students' academic writing. The interview schedule was refined in the light of this pilot interview and of the pilotee's feedback on the structure of the interview and the questions. An external, independent interviewer was employed to carry out the interviews in order to avoid tension between the authors and faculty colleagues who might have felt as if their feedback practices were being evaluated.

The semi-structured interview schedule was divided into two parts. In the first section, tutors were asked whether and why they commented on the five categories described above. They also had the opportunity to say whether they commented on any other writing issues. In the second section, the focus of the questions was on why there was found to be a discrepancy between the number of errors the research team found and the number of errors commented on by tutors in general; whether and why tutors felt there was a need for more writing skills intervention and, if so, when this might happen; and, if intervention was regarded as valuable, to what extent they would feel it was within their job remit and knowledge/skills capacity to provide it.

**Narrative Data Analysis**

The interviews were 45 to 55 minutes in duration and were recorded and transcribed. Transcripts were analyzed using thematic analysis. An initial coding framework was constructed based on concepts from Bourdieu's theory of social practice, as cited in Shay (2005). However, this framework was further developed through ongoing dialogue between the two researchers and as early coding identified emergent themes and sub-themes (Ritchie & Lewis, 2003). The themes were then refined and all of the data were coded through a constant comparative approach to determine an established framework of conceptual themes and a preliminary understanding of the relationships between them. Interview transcripts were also matched with each tutor's essay feedback in order to analyze areas of convergence and divergence between actual and espoused practice.

The findings and our analysis were presented to faculty colleagues at a development day to seek feedback and comments, helping to improve this article.

## Findings

**Essay data**

**Quantity and range of errors commented on.** Tutors offer academic writing comments on all categories identified by the research team, but only to some extent. Whereas the research team found a total of 299 errors in five essays, the tutors commented on 91 errors, representing 30% of the total errors that could have been commented on. Also interesting is the variation in the quantity of comments given by the tutors, ranging from 8% to 53%. See Table 1 below.

Tutors have a notion of error gravity; that is, some categories are commented on more than others. Categories are ranked in order of gravity in Table 2 below, with Genre being the category most commented on and Syntax being the category least commented on.

Also evident in Table 2 is the individual variation among tutor markers in terms of category reach and

Table 1
*Quantity of Errors Commented on by Tutors*

| % Range of Total Errors Commented on Across Five Tutors | | | | |
|---|---|---|---|---|
| 8 | 22 | 23 | 45 | 53 |

Table 2
*Error Gravity, Category Reach and Percentage of Possible Errors Commented on by Tutor*

| Category | % of possible errors commented on by tutor markers (M) | | | | |
|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 |
| Genre | 70 | 33 | 24 | 67 | 100 |
| Referencing | 100 | 67 | 8 | 33 | 95 |
| Lexis | 72 | 25 | 11 | 0 | 27 |
| Sentence construction and punctuation | 25 | 0 | 0 | 0 | 19 |
| Syntax | 20 | 0 | 5 | 0 | 0 |

percentage of possible errors commented on within the categories. In terms of category reach, marker 1's spans across all five categories. However, marker 4's spans only two categories, and markers 2, 3, and 5 reach across slightly different categories.

With regard to percentage of possible errors commented on within the categories, there is wide variation. Whereas marker 5 comments on all possible errors identified in the Genre category, marker 3 comments on 24% of the total possible errors in that same category. Similarly, where marker 1 picks up 72% of all the lexical errors identified by the research team, marker 4 does not pick up any. In fact, errors of lexis, sentence construction, and syntax attract no comments at all from some of the tutors.

Thus, the numerical analysis presented above indicates that while there is some shared practice, there is also individual variation. The interview data are presented next in order to explore this variation.

**Interview data**

**Why do tutors comment on aspects of academic writing?** There was a consensus amongst the interviewees that academic literacy was important for operating both within the wider university context and within the teacher-training context of the Faculty of Education. In fact, all of the interviewees stated that they would—and they do—pick up on errors in each of the categories identified above for the reasons stated below:

1. Because ours is a widening participation university and, as such, many students have underdeveloped writing skills:
   - "… we're an access university" (M4)
   - "… we know that some of them … are very very weak" (M4)
   - "I think there's no doubt that quite a few of them need some input, help, development in their writing." (M2)
2. Students need academic literacy for the following reasons:
   - For academic development: "… it's going to stop them in an academic world getting further than a basic level…" (M1).
   - For teaching: "In our case particularly because we do teacher training and they've got to teach basic writing skills, punctuation etc to children" (M2).
   - For professional language use: "I think not least on a vocational course for teachers we would have an expectation that they would use appropriate language even in school and if they're writing to parents and so on later …" (M4).

**Why do they comment only to some extent then?** It is safe to assume that across most British universities, tutors are being asked to do more with less due to decreases in government funding, caps on student numbers, and, with the increase of tuition fees, students being re-conceptualized as "customers" requiring, if not demanding via the National Student Survey, better "service." These constraints of resources, time, and numbers were a common theme among the tutors:

- "I have 15 minutes to mark each essay" (M3);
- "If you're marking 100 assignments in a batch, you don't always have time to go through them with a fine-tooth comb and a very short turnaround time, you don't" (M2).

**Tutors' beliefs.** Variation appears to exist in terms of knowledge of discourse conventions and views on:

student competence, affect, academic writing development and their role in its development.

***Minor differences in knowledge of discourse conventions.*** While all the interviewees said that all five categories established by the research team were comment-worthy, two tutors acknowledged a degree of uncertainty with regard to certain aspects of academic writing:

- "I have to admit that's not one of my strongest things. I use semi-colons quite a bit but colons I have to think about it, so again if I have to think about it too long, possibly I'm not going to be picking up on it" (M1);
- "[Re: comma splice] I don't know that that's something that often leaps out at me" (M2).

***Views on student competence.*** Two discourses were identifiable in the interview data, the first suggesting students lack the skills necessary to cope with university writing and the second suggesting that students are only beginning to learn these skills.

- Deficit: "I think there's too many of them who lack basic writing skills …" (M2).
- Developmental: "They're early on in their writing. The sentences are quite long, so they don't know when to stop" (M5).

***Views on affect.*** Whereas the first tutor below feels that too many comments would impact negatively on students, the second feels that, with discussion to mediate potential negative affect, numerous comments can serve developmental purposes.

- "... a comment every 30 words on a comma or a circle or something, would just be, the students would leave honestly, in droves" (M4).
- "…when they've received an assignment back and it's been scrawled all over by me, they're a bit shocked, and I said, but it's there to help you, you need to get over that shock, and it's there to support you. Ok, I can see now. So once I've talked it through then … I think it makes a difference" (M5).

***Views on academic writing development.*** Although the tutors did not name or claim to adhere to a specific model of academic writing, three views were perceptible in the tutors' discourse. They include the following:

1. A Study Skills View: Academic writing and subject knowledge are deemed by the tutor below to be discrete entities, with the former conceptualized as a generic set of skills that anyone can teach:
    - "… I am equipped to teach the students to write an essay for me in terms of my specific content but I think anybody can teach them the skills of writing an assignment…" (M2);
    - "I do equip my students to write for my subject, but I don't teach them about paragraphs and punctuation" (M2).
2. An Academic Socialization View: The tutors below express a notion of inducting students into the academic community, bringing them into the fold and giving them time to let their writing skills work themselves out as they come into contact with existing conventions:
    - "Because I think that when they're coming into the university we've to induct them into our writing processes and that's not always made clear to them through a study skills course" (M1);
    - "Work does improve over time on both levels, content and grammar" (M3).
3. An Academic Literacies View: The tutor below mentions engaging in dialogue with her students and embedding academic writing into the program, two principles lying at the heart of an academic literacies model.
    - "But there's no time within the module to teach them in smaller groups and so I think you would get that level of verbal discussion which would then enhance their writing" (M5)
    - "There needs to be more intervention throughout the degree. It's not just in the first year, yes, throughout each year that they're here" (M5).

**How tutors view their role in developing students' writing.** Tutors appear to view their role in different ways, as indicated by the responses below:

1. Yes, it is the subject tutor's job: "I do think it's part of my role as a subject tutor" (M5 in response to her picking up on a relatively large number of linguistic errors).
2. No, it is not: "I don't view that as my job particularly to help students address

individual issues such as a lack of ability to use an apostrophe or a paragraph" (M2).
3. It should be shared with the learning support unit: [Intervention should come from] "both sides really, from us as tutors and from the library maybe, from [the learning support unit] yes" (M5).
4. Not sure: "… but whose job would it be to intervene and who would track that and follow it up is my question" (M3).

**Tutor's practices.** The interviewees also reveal differences in their feedback practices in terms of what to give feedback on, when to give it and how:

1. What to give feedback on: "…it's that academic style that I would pick up" (M1); [Poor in-text referencing] "is one of my bugbears and soapboxes …" (M5).
2. When to give feedback: "I will put more time in for a first year or a first assignment than I might for a later assignment…" (M1); "I didn't look at punctuation or paragraphing or anything like that, but I did look at referencing because it was their very first assignment, but I don't particularly see that as my job with 2nd or 3rd year students" (M2); "… so if it's not picked up, even in Year 1 or Year 4, then I don't feel I'm doing them justice. So even in Year 4 when I mark an assignment, I still look at all these things" (M5).
3. How to give feedback: "I would just grab 'Vague,' pop it on there, release, when they hover over it they get a very comprehensive explanation" (M4 with reference to using Turnitin's standard comments); "I often comment about the use of reading on the cover sheet but I don't often comment about wrong word use, lexis, on the front, unless it was absolutely dreadful all the way through" (M2); "There's a comment bank on the right hand side and you can also make your own and what I've done, is added my own, because you can just click and drag a blank box and put your own comments in, so I've started with that now" (M5 with reference to Turnitin).

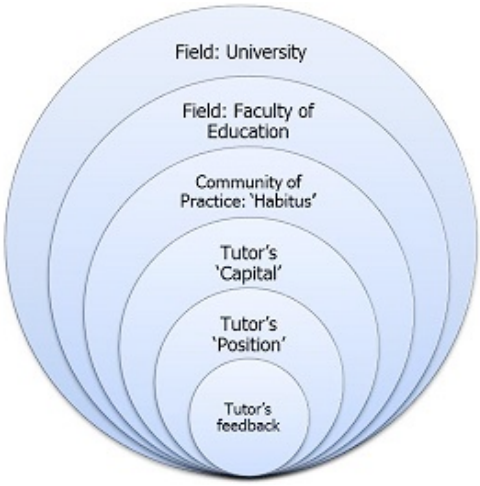
## Discussion

Bourdieu's theory of social practice (cited in Shay, 2005) provides a useful tool for interpreting the data presented above. Within Bourdieu's framework, practice (i.e., academic writing feedback) is socially situated and has to be seen in the context of its "field." For the purposes of this research, the field and sub-fields are academia, the University, the Faculty of Education, and the subject discipline of primary education. It is the institutional and professional field that determines the epistemic "principles of vision and division" (Bourdieu, 1996, p. 265 cited in Shay, 2005, p. 667). The participants who share these principles (i.e., primary education subject tutors) form a community of practice. Their shared set of principles is referred to as the *habitus.* In other words, the subject tutors share a common "perceptual framework" (Goodwin, 1994, p. 616 cited in Shay, 2005, p. 668) which guides their marking. However, participants have varying "capital," for example, knowledge or commitment to particular theories within the field, and as a result, they may hold different "positions." To put it simply, and with reference to this particular research, variations in subject tutor capital and positions do appear to lead to variations in practice with regard to how much feedback is given, on what, and how. Figure 1 represents the multiple layers through which tutor feedback on academic writing is filtered. When the interview data are viewed through this lens and particularly when they are matched to the numerical data, some interesting observations come to light.

First, subject tutor markers seem to believe that there is more of a "habitus" than actually exists. All were unanimous in their pronouncement that academic literacy is important, and no real commitment to an error gravity hierarchy was revealed in interviews; all 5 categories for classifying errors were stated as being comment-worthy by the tutor markers, and tutors believed they commented on all of them in their own marking. However, the content analysis of their essay data, as presented in Table 2, revealed this not to be the case. Marker 4, for example, picks up no errors of lexis, syntax, and sentence construction and punctuation. There is a difference, therefore, between his/her espoused and actual practice.

It may be the case that when marking this particular essay the constraints of the field (time, resources, quantity of essays) prevented this tutor from commenting on these types of errors, or it may be the case that this tutor holds unconscious attitudes to standards in writing. For example, the tutor, like those identified in Hyland's (2013c) study, privileges content (meaning) over language, managing somehow to separate the two. If this is the case, then the hope would be that the mark reflects this unequal weighting. However, if the tutor is marking the student down for linguistic inaccuracies but giving the impression, via no comments, that they do not matter, then there is cause for concern. In their study investigating tutors' sense of standards as enacted through marking practices, Bloxham and Boyd (2012) discovered that the standard of English did indeed act as a "trigger" quality for grading (p. 627). If this is normal practice, then we are doing students a disservice not highlighting and helping students address linguistic errors and not raising their awareness of the power of language (accurate and appropriate in terms of genre and linguistic variety) in the marker's perceptual framework and also, arguably, in the minds of the parents with whom they will one day correspond.

Figure 1
*The Mulitple Layers Through Which Feedback Is Filtered*




Second, viewing marking as a complex, multi-layered social practice helps to explain at least some of the individual variation that exists across the tutors in terms of their marking/feedback practices. The tutor who exhibits a good level of language awareness and familiarity with academic discourse practices and who seems to align herself with assessment *for* learning and an academic literacies view (M5) comments on a high number of errors comparatively. She appears to possess the capital required to forward students' academic writing. This capital would then seem to impact on her position in that she sees it as her job as subject tutor to comment on the categories identified, and her position would seem to determine her practice in that she comments on academic writing issues regardless of year of study. In contrast, the tutor who acknowledges a level of unfamiliarity with certain discourse practices, and whose own discourse seems to reflect a deficit/study skills perspective (M2), provides fewer comments across fewer categories. She does not view it as her job to address issues of sentence construction, punctuation, and syntax and would not comment on these issues beyond Year 1 of a student's academic journey.

The question arises, is this level of variation acceptable? If we accept that marking is a "socially situated interpretive act" (Shay, 2005, p. 663) and that consensus will never be achieved due to both shifting interpretations and standards (Bloxham & Boyd, 2012), then the answer must be "yes." However, this does not mean that the existence of variation ought not to be acknowledged within the community of practice, and a good starting point for this is a discussion about what is valued (Broad, 2003). The findings presented within this article suggest that tutors do value academic literacy for student teachers' academic development, their teaching, and their professional language use. Therefore, we would argue that subject tutors need to engage each other in dialogue about what aspects of academic writing they privilege, why they privilege these, and how this impacts on their essay feedback practices and also, possibly, on the marks they give students.

We would also agree with Broad (2003) that colleagues need to discuss how to represent what they have agreed to value. Adding an "academic language" component to marking criteria may help bring the issue to the fore for both staff and students, but it may also create an artificial and unnecessary separation between language and epistemology, between *techniques* and *understanding*. This is something the authors have grappled with themselves in the process of carrying out this research. It is for this reason, and for the reason that some subject tutors may not have total confidence in their own linguistic awareness, that we would suggest subject tutors come together with EAP staff or language specialists to share knowledge and to address complex issues of language and epistemology and how best to develop students' academic literacy within modules, including within assessments and feedback. Ideally discussions would lead to staff development and then on to faculty-based initiatives aimed at developing the academic literacy of all student teachers.

## Conclusion

This study set out to explore the extent and nature of the role taken by subject tutors in developing students' academic writing through the feedback they provide on students' essays. We do not assume that feedback on essays

is the only way that academic writing is developed in this particular faculty, but we do know it can play a very important role in teaching and learning. We also acknowledge the limitations of this study, including its small-scale nature and the focus on negative (errors) as opposed to positive developmental feedback, and we believe the latter to be a worthwhile focus for future research. The results of this piece of research, however, do shed light on these tutors' current practices and underlying beliefs and values. The essay data indicate that tutors comment on all 5 categories of error established by the research team, but only to some extent. There is individual variation in terms of the quantity of comments given, the number of categories that are commented on, and the percentage of possible errors commented on within each category.

The interview data reveal a shared belief in the value of academic literacy but divergent views on the actual practice of giving feedback, which we judged to be due to differences in tutors' knowledge and positions. When marking is viewed as a social and interpretive act, this variation is not wholly surprising. Nevertheless, divergent practices may result in divergent experiences for these student teachers, possibly on a number of levels, both on and beyond their program of study. These include: the grades they receive for their assignments; the extent to which their understanding of language, discourse, and genre is developed; their sense of belonging to a discourse community; their future ability to teach writing; and the way they are perceived by prospective parents.

If tutors are committed to the development of all student teachers' academic literacy, then we believe it is necessary that they engage each other in discussion about their feedback practices and about ways of raising their own and their students' awareness of language, discourse, and genre. One suggestion for doing this is to work collaboratively with EAP colleagues or language specialists, taking a team approach to the provision of essay feedback. Another suggestion, if the time and incentive exists on both sides, is to engage in team-teaching, perhaps supporting just one assessment item within one module to begin with and eventually working towards a more holistic approach to embedded literacy instruction.

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## *Appendix*
## Description of Error Categories

**Genre** = anything that marks the academic essay genre apart from other genres (except referencing, which has its own category). This included issues related to cohesion, coherence (cohesive devices); paragraphing (topic sentence, development/support); structure (introduction, body, paragraphs, conclusion); academic style (objective language: pronoun use, active/passive voice, mitigation/qualification; gender-neutral language); argumentation (making claims and warrants, using evidence, positioning/aligning oneself with other voices in the text); and register (formal/informal language, contracted forms).

**Referencing** = the Harvard System of referencing for acknowledging the work of another author. This included issues related to inclusion of in-text citations and end-of-text references; accuracy of citations and references; appropriateness of quotations/citations (those that actually support or contribute to a line of reasoning; quality in terms of selectiveness and currentness).

**Lexis** = vocabulary. This included issues related to choice of words/phrases to express meaning; collocations; spelling.

**Syntax** = grammar. This included issues related to word forms; subject-verb agreement; relative pronouns; gerunds/infinitives; articles; prepositions.

**Sentence Structure and Punctuation** = simple, compound and complex sentences, accurately assembled and punctuated. This included fragments (i.e., incomplete sentences); run-on sentences; comma splices (i.e., joining two independent clauses with a comma); wrong punctuation; missing punctuation; quotations not integrated grammatically into the fabric of a sentence.

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# Waiting for the Expert to Arrive: Using a Community of Practice to Develop the Scholarly Identity of Doctoral Students

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This qualitative study examined the identity of doctoral students in their quest to become scholars. The research question asked: What impact did a Community of Practice have on the doctoral students? The findings illustrated that on the journey the participants struggled to integrate multiple identities and roles. They also refined their identities within the liminal spaces of the doctoral process and the Community of Practice (CoP). The CoP provided validation to help the participants grow and emerge into scholars as they built relationship through the many opportunities they used to co-create knowledge for themselves and others. Under the guidance and direction of an expert and scholar in the field, we held the vision of becoming experts within our respective subject areas, trusting the CoP to facilitate the process of our transformation into scholars.

Talk with students currently in a doctoral program or those who have completed their program, and they will surely share how the experience comes with an ample amount of work requiring lots of time, sweat, and maybe even tears. In addition, they may further reveal that the experience of a doctoral program is not complete without also facing some anxieties and fears about the mastery of what it means to be a scholar or expert within a chosen discipline: anxieties about the worthiness of his or her research, or the competency to present research to groups of established scholars, or even submitting research for publication and facing criticism of prospective peers in a positive way, and the list could continue. The process of becoming a researcher and adopting a professional and scholarly identity is a process of transformation and identity development beyond that of an undergraduate or masters level student.

For us, the terms "scholar" and "expert" are interchangeable. Merriam-Webster defines expert as "having or showing special skill or knowledge because of what you have been taught or what you have experienced" and scholar as "person who has studied a subject for a long time and knows a lot about it: an intelligent and well-educated person who knows a particular subject very well" ("Merriam-Webster", n.d.). Caley and colleagues (2014) define an expert as "someone with a comprehensive and authoritative knowledge in a particular area not possessed by most people" (p. 232). Burgman and colleagues (2011) define experts as "those with certain qualifications, track record, and experience" (p. 1). With these definitions, a case could be made for the successful completion of a doctoral program as evidence of becoming a scholar or expert. Yet a scholarly identity was, in our minds, beyond our grasp. It must be the result of more experience, more education, more published research, more conference presentations—whatever we might possess; in our minds a scholar or expert was someone who was a step beyond our own accomplishments. Berliner (1986) identifies problems in studying expertise; "the grand master in chess, of course, has won thousands of games against tough opponents. Points and wins are accrued over time. In the same way an Olympic champion is accorded his or her gold medal. In such cases agreement about who is and is not an expert is easy to obtain" (p. 8), but it is not always so easy, particularly within academia. Part of our process involved demystifying scholarly practice and moving closer to owning the identity of scholar or expert.

The following is a research project that examines how the identities of three doctoral students and a recent doctoral program graduate in an adult education program at an urban university developed over time using the concept of Communities of Practice (CoP). While demonstrating the use of CoP to influence the development of the participants' identities, the research will further illustrate how a doctoral program functions as a liminal space complete with traditional practices and certain rites of passage in helping move students closer towards an identity as a scholar. The exploration into the development of a scholarly identity attempts to address the need for further research about identity development of adult students in higher education (Kasworm, 2010), while also highlighting that identity development is not isolated to traditional teaching methods alone (Jimenez-Silva & Olsen 2012).

## Literature Review

Lave and Wenger (1991) first postulated CoP as a means of co-creating knowledge. It has been applied to many arenas, such as business (Wenger, McDermott, & Snyder, 2002), higher education (Monaghan, 2009), and management education (Monaghan, 2011), to name a few. Communities of Practice consist of individuals who organically form a learning community to assist them in self-directed, collaborative co-creation of knowledge. In most instances, this may be driven by a

desire to enhance the learner's professional development. The CoP framework guided this study from beginning to end. This particular CoP formed during a doctoral class in an urban university, and the members of this community continue to meet monthly almost three years later to continue various projects. The continuation of this CoP was a result of the members' desire to continue their professional development from novice to expert scholars in their field. This literature review will focus on CoP in higher education with an emphasis on doctoral studies, identity development and the development of emerging scholars, the liminal nature of doctoral studies, and transformational learning.

**Communities of Practice in Higher Education**

Wenger (1999) argues that learning is not an activity that can be separated from other situations and life experiences. He argues for a model of learning he calls a "social theory of learning," which encompasses dimensions of learning such as social structure, collectivity, practice, meaning, situated experience, power, identity, and subjectivity. He does not propose that his "social theory of learning" should replace other models of learning, rather that his model is an attempt to understand better the ways that learning operates with the social structure.

Communities of Practice are used as a tool in many higher educational contexts; they are used in the contexts of faculty development and in both graduate and undergraduate level education. In a CoP, learning is both socially situated and socially constructed (Zimitat, 2007). A CoP can be an important tool for use in education, as it can provide a practice-based situation where learning can develop, moving an individual's knowledge from an accepted to transformed state (Andrew & Ferguson, 2008). Even in an online environment, CoP has been shown to develop elements of mutual engagement, joint enterprise, and shared repertoire in participants (Moule, 2006). Further, it has been demonstrated that the use of CoP in university education can foster increased student confidence, improved communication skills, development of problem-solving skills, and acquisition of practical experience in their discipline (Yap, 2012). In a CoP, students learn actively through participation; in fact, "learning by doing" is one of the hallmarks of Wenger's model. Communities of Practice models of learning help prepare adult students for a more successful early college experience (O'Donnell & Tobbell, 2007). A CoP can be especially useful in a doctoral program.

The purpose of a PhD program is to prepare a student to become a scholar. "The program emphasizes the development of a student's capacity to make significant original contributions of knowledge…" (Council of Graduate Schools, 2005, p.1). This transition requires students to shift from the role of course-taker to independent scholar (Lovitts, 2005). A course-taker is a "consumer of knowledge" that operates in a "tightly bond or controlled environment" (Lovitts, 2005, p. 138). Conversely, a scholar is a "producer of knowledge that often results from uncertain processes that take place in unstructured contexts" (Lovitts, 2005, p. 138).

It is somewhat of a paradox that research and writing are so important in doctoral studies but students feel "unprepared to make this transition" (Lovitts, 2008, p.296). Students encounter ambiguous expectations that they need to conduct independent research but struggle when attempting to navigate the scholarly world. This struggle occurs because students are not familiar with the practices of scholars and therefore do not feel part of the scholarly community (Lovitts, 2005; Vekkaila, Pyhältö, & Lonka, 2013). Creating safe space for students takes time but can make a difference. As noted by Turner and colleagues (2012), "Facilitating the development of an affirming environment can serve to enhance students' understanding of what is needed to become exemplary researchers" (p. 109-110). Doctoral students also need "support in interpreting the scholarly world and its requirements" (Vekkaila et al., 2013, p. 76). In addition to personal traits like intelligence and motivation, doctoral students need the support of experienced academics and other graduate students to facilitate the socialization process into academia and engage in scholarly activities (Gardner, 2007; Lovitts, 2005; Turner et al., 2012; Vekkaila et al., 2013). Pairing seasoned and emerging scholars in a CoP to engage in the process of performing scholarly research can help students make connections similar to the process described by Jimenez-Silva and Olsen (2012), where this combination of processes helped pre-service teachers "bridge the gap between what they learned in the courses…and their future practice" (p. 342). One of the outcomes of a PhD program is to help students develop an identity as a scholar, and CoP are intended to help participants develop their identities.

**Identity**

Kim and Merriam (2010) take a sociocultural look at identity within a CoP. Their qualitative study found that participants in a computer learning course increased their self-efficacy and self-esteem, and they felt less marginalized than when they started the course. Another important finding was that the CoP allowed learners to hone their skills by mutually engaging with other learners of varied experience within the context of classes and social gatherings. Novice learners are not only developing a greater competence in a professional

skill. As they become experienced members of a community, their identity changes as they experience integration and empowerment (Lave & Wenger, 1991; Merriam, Courtney & Baumgartner, 2003).

Identity formation plays a large part in how graduate students, as adult learners, go from a position of seeing themselves as students to seeing themselves as scholars. Some of the research (Kasworm, 2010) in the field of adult education examining the role of identity and students has looked at undergraduate students in both community colleges and research institutions. It attempted to address the nature of adult student identity within these respective environments. Using social constructivism, Kasworm (2010) explores the co-construction of positional and relational identities. She points out that a student's identity is positional in the sense that the student is attempting to negotiate meeting the academic challenges set before them and developing a sense of agency as certain goals are accomplished successfully. Similarly, she points to the construction of relational identities as well, which are developed through a student's acceptance by others within their social environment, in particular with their faculty members. Kasworm believes the key to understanding the co-construction of the students' positional and relational identities is recognizing how their identities reflect multilayered, multisource, and paradoxical beliefs of themselves and their positions. This study is key for understanding how adult students 25 and older develop an identity as students in an environment that is predominantly made up of younger students. The result of this study demonstrates how adult students found and valued their voice within the classroom and that this newfound voice was negotiated through their classroom engagements and academic competence.

Deaux (1993) used the term "identity packages" to describe how a person maintains membership in multiple categories (p. 6). An individual's choice of categories and the meaning they attribute to these categories forms their identity. Deaux's concept of an "identity package" illustrates that identity is not singular but the assemblage of multiple identities. Looking to the work of Ashmore, Deaux, and McLaughlin-Volpe (2004), Goldie (2012) posits "identity is realized through a dynamic process of identification by which individuals classify their place in the world as both individuals and members of collectives" (Ashmore et al., 2004, p. e641).

**Liminality**

Further looking into the identity of students in higher education, the research of Field and Morgan-Klein (2010) proposes that "studenthood" or "the variety of different ways in which registering for an educational program is implicated in people's sense of who they are" (p. 1) is a distinctive identity form related to the transitional nature of a learner in higher education moving from one status to another. To expand on this transitional nature of students in higher education Field and Morgan-Klein use the work of anthropologist Turner (1987) to discuss the concept of a liminal persona or liminality. In Turner's research, liminality functions as rites of passage where individuals move through customs and rituals to take on new identities while leaving behind old identities. According to Field and Morgan-Klein, studenthood is a liminal status because of its temporality. It is between the old identities and yet to be formed new identity, it is bounded by time, which determines when you enter and when you exit, and it has a prescribed set of curricula and customs that must be accomplished and mastered before exiting into the new identity.

**Transformational Learning**

Another lens to examine the development of emerging academic professionals and scholars is transformational learning. Mezirow (1997) describes transformational learning as "the process of effecting change in a frame of reference" (p.5). Transformative learning occurs when an individual's perspective profoundly changes, resulting in a new frame of reference that will guide future action. This change is not the result of a lived experience alone; rather, it requires an individual to examine and clarify the experience through critical reflection and reflective discourse with others. The CoP provided the container for reflective discourse with others.

In summary, a number of studies discussed form the basis of the research gap that is addressed in this study. Both Kim and Merriam (2010) and Jimenez-Silva and Olsen (2012) demonstrate that learning is not isolated to teaching methods but can be strengthened using CoP. Kasworm (2010) concluded her study by stating that there is a need for further research on adult student identity in other collegiate contexts. Our study sought to examine the premise that the validation gained through participation in a CoP could enhance the validation of students in the scholarly community at large.

**Purpose of Study/Research Questions**

The purpose of this study was to examine the identity development of doctoral students as they became scholars. The research question asked what impact the CoP had on the students' identity as emerging scholars.

## Methodology

This was a qualitative study. Qualitative research focuses on achieving an understanding of how people

make sense out their lives, attribute meaning to their experiences, and interpret their experiences (Merriam, 2009). This approach was used to explore how the experiences within a CoP influenced identity development as emerging scholars. Data was collected over the course of fourteen months in the form of written reflection and analysis in response to the specific research question.

**Context**

The participants in this study were three doctoral students and one recent graduate of the program who was also the co-instructor in the course. The course was "Advanced Seminar in Adult Learning and Development." One learner was in her first semester, a second learner was at the beginning of her second year of coursework, and the third learner was entering the candidacy phase. All participants were interested in becoming professionals within the field of adult education and brought different backgrounds and adult education experiences. The fifth member of the CoP was the tenured faculty member who was the instructor of record for the course.

**Data Collection**

The CoP conceived of a research project within the course timeframe. Research questions were developed, and all the participants/researchers agreed to write detailed reflection papers in response. In order to separate the course assignment from this research project, the reflection papers were written and submitted to the CoP six weeks after the course ended. That process and the resulting research paper and conference presentation led to the current research question presented here. A prompt was given to address the research question in the reflection papers: "Since the completion of the Advanced Seminar Course a year earlier, how has the evolving nature of the CoP impacted your self-efficacy as an emerging scholar?" After all of the participants submitted reflection papers for this study, the researchers, who were also the participants, proceeded to analyze the data.

**Data Analysis**

To analyze the data, several in-person data analysis sessions were held to review and code the written responses. Data was analyzed using categorical aggregation (Hébert & Beardsley, 2001). Each individual reflection piece was coded and member checked by two readers to highlight themes related to the research question to provide intercoder agreement, thus to provide some evidence of validity (Mitchell, 1979). As issue-relevant clusters and patterns emerged, they were coded and recorded. In addition, all the researchers reviewed the themes and supporting data as a further aspect of using member checks. "We have found that members' feedback [in a research team] is very valuable and sometimes helps us see or emphasize something we missed" (Maykut & Morehouse, 1994, p. 147). We report the primary themes that emerged in response to the research question in the next section.

**Findings**

Several key themes emerged: multiple identities, refinement of identity, validation of scholarly roles, and struggle. This section provides a description of each theme with participant quotes to help elucidate the various themes. A discussion of the findings follows.

**Multiple Identities**

The CoP allowed us to explore the connection between our experience as scholars and our self-knowledge. We described the scholarly identity as one dimension of multiple identities. The theme of multiple identities emerged because the CoP not only nurtured the development of a scholarly identity but also provided the space to explore the connection between the scholarly identity and other dimensions of our "multifaceted identities." One CoP participant describes, "I could look forward and think about how my new identity influenced all the spheres in my life – from personal, recreational to professional."

We discovered that the interaction between the various dimensions of one's identity is fluid as the meaning attributed to life roles influences identity, but self-perception also influences how one approaches various roles. One participant describes, "As I have worked on the development of my own identity as a scholar, within the field of adult education, I am also working on my identity as a manager within [my] organization." The image of a bridge emerged to illustrate the connection between multiple identities that are experienced simultaneously. The participants expressed a need to bridge the gap between different life roles, particularly for those who have a career outside of academia: "One path is scholarly; one path is my current job outside of academia. At times I am able to bring the paths in alignment, but it is not as often as I would like." Social expectations accompany life roles, and struggle can occur when expectations of a multifaceted identity conflict. At times, we experienced an internal struggle when attempting to bridge these gaps or navigate the complexities of our multiple identities.

**Refinement of Identity**

Other researchers have discussed the process of identity creation or formation (Ashmore, et al., 2004; Goldie, 2012). Building upon that sense of active formation, we conceived refinement of identity as a process wherein identity is explored and reflected upon as a more fully realized identity takes shape. Similar to the way a sculptor might take a piece of marble and chip away at pieces that do not fit the final vision, members of the CoP had been chipping away at our sense that we could not be or are not yet scholars. The participants kept waiting for a specific moment when they would "feel" like the experts everyone said we would be. If an additive metaphor is preferred, it is also similar to the way that a sculptor might add clay to a sculpture, continuously manipulating and changing the piece until the sculpture is complete. In our conceptualization of this theme, the process of refinement is evolutionary in nature and has not come to an end for any of the CoP participants. Refinement indicates a sense of continuity as part of identity that it is not completed at any particular point in time but rather continues to grow and morph throughout our lives. Refinement of identity is further complicated by the multiple identities that we all possess as mentioned earlier in the literature review. One CoP participant elucidated, "As I add meaning to my role as a graduate student I begin to see myself as a scholar which influences my professional identity as an academic advisor." Each of our many identities is at a different stage of development and is beautifully multifaceted. The participant continued, "My identification in each of these roles is at different levels of self-actualization as I consider myself an emerging scholar and a practiced academic advisor."

The CoP began with the vision of "developing a place to help other members of the community develop their identities and expertise as scholars in the field of adult education." As the CoP has evolved as a collective experience, so too have participants evolved. "…as I have transitioned more into working on my dissertation and research from my role as student and graduate assistant, I am more able to see a future for myself [as an] academic scholar." The process has helped us validate our own identities.

**Validation**

Participants characterized the CoP experience as validating, "[W]hen I shared my research ideas with the group, they provided supportive comments and feedback. They helped me to more carefully think through my work. This helped me to see my own knowledge and curiosity as valid." Through participation in the CoP, a connection was made to the larger field of Adult Education: "I had never seen my ideas that way before – as being something fresh and innovative."

In this CoP the doctoral students found opportunities and space to develop their voices and identity as emerging scholars. Contributing to this is that one member of the CoP, the course instructor, is an established scholar within the field of adult education and served as a role model and mentor to the students. As graduate students, the other participants identified the instructor as someone whose voice and opinion was valued within the field of adult education, thus helping us to feel comfortable taking on the role of emerging scholars and expressing our own voices and opinions. Others have also noted the value of this relationship (Kasworm, 2010).

In addition, engaging in scholarly activities resulted in an informed approach to work outside the academic sphere. Newly acquired knowledge and skills guided decision-making and practice. One participant described, "I have gained program development and assessment knowledge so I am not only reflecting and refining my work but evaluating and considering new ideas to improve advising service." The CoP provided an environment that nurtured the development of a scholarly identity, as well as a space to reflect on how it is realized in relation to other identities: "This CoP allowed me to sort this out through our interactions, co-creation of knowledge and reflection."

Part of the challenge in adopting a new identity, especially the identity of scholar, is that there is always another script to complete and level that you need to achieve before you arrive. Academia is rife with milestones that are easy to conflate with clear changes in identity: when doctoral students defend their prospectuses they become doctoral candidates, when they graduate they become "doctors," when hired by an institution of higher education they become faculty, and when they become tenured they have fully "arrived." One participant elaborated on his future as a scholar, "I am more able to see a future for myself … within a community based organization because I think there is a need within the community." He continued, "There is a need to bridge the communities of higher education and community organizations together, but also as a researcher to tell the stories in an empirical manner of those, I serve."

**Struggle**

An experience of struggle was a very strong theme, as it flowed throughout all of the findings. Bridging the gap between multiple identities, experiencing the process of identity refinement, and seeking validation are not endeavors that effortlessly transpire by following a step-by-step guide for achievement.

Alternately, navigating these processes resulted in struggle as the participants situated a new scholarly identity within our multifaceted identities. "So I am left to wrestle with the question of how will what I have learned in the academic space be useful in the non-academic space." This struggle became the disorienting dilemma that initiated the transformative learning process. "My challenge as I see it is to both keep up the scholarly momentum while simultaneously figuring out what will be my next steps career-wise. I'm seeking a balance that works well for me and a melding of the paths." The need for balance revealed the disorienting dilemma as the participants experienced a disruption in their current perspectives. The CoP provided a space for the participants to reflect on the struggle that resulted from integrating the role of scholar into their existing identity.

## Discussion

The concept of "scholar" is often conflated with the title of professor. For doctoral students/graduates who are practitioners outside of an institution of higher education, this adds a challenging dimension to the development of a scholarly identity. Indeed, institutions of higher education may be enforcing barriers to practitioner-scholars through structures that reinforce the role of the institution as the keeper of all practices academic. This can then be enforced through the social network of those associated with the institution as a regulatory power. "One way regulatory power works is by categorizing people in terms through which they come to understand themselves. Individuals become subjected to the rules and norms engendered by knowledge about these identities" (Goldie, 2012, p. e642). In other words, it can become difficult for anyone to consider the identity of scholar outside of institutions of higher education and the roles of student and faculty. This often leads to doctoral students continuing to wrestle with disorienting dilemmas beyond the attainment of their degree. Once again, they may be waiting for the expert (themselves) to arrive.

Participation in the CoP facilitated a transformation from student to scholar by providing the appropriate environment for self-reflection and critical discourse with others (Mezirow, 1997). In the CoP that is both the catalyst and research subject of this current study, the members engaged in transformational learning as we wrote conference papers and articles while presenting at conferences. In working with each other we follow a few key principles for successful collaborations (Nevin, Thousand, & Villa, 2011). First, we choose to work together and continue to make that choice on an ongoing basis. Second, we are clear about the goals that we set both as individuals and as a community. Third, we nurtured a collaborative spirit right from the start, using deliveryme.com to order food and then taking a break in the middle of, or during, our working sessions. Fourth, we reflect on how our projects and relationships are proceeding and celebrate each accomplishment; this celebration includes collaborative accomplishments as well as the achievement of individual milestones, such as a successful prospectus defense. Fifth, we are each responsible for individual tasks and expect to be held accountable for delivering. Finally, we are willing to allow new paradigms to emerge from our work together and actually find that shift to be part of our growth and identities as scholars. The CoP provided the container for reflective discourse between members (Mezirow, 1997), which fostered the ideal setting for transformative learning to take place: a safe environment that supports collaboration, reflection, and feedback.

Validation as a theme exemplified the relationship between the student and instructor and served as what Kasworm (2010) considers relational identity. Turner and colleagues (2012) present as best practice doctoral faculty members who "provide examples of their own research process, including dissertation completion, and the barriers as well as facilitators encountered along the way," noting that "when accomplished faculty members reveal their challenges, they promote a safe environment in which students can reveal and overcome their own self-doubt" (p. 107). Further, Lombardo and Eichinger (2002) refer to competencies as the "universal common denominator" (p. 17) critical to success. This CoP has been focused on the education and practice of key competencies connected with academic professionals and leaders—including writing, publishing, and teaching—all grounded in adult learning development theory. In one of our many CoP discussions the statement, "Hold the vision, trust the process," was used to describe what we were experiencing. Together we held the vision of becoming scholars and trusted the CoP to facilitate the process of transformation. As we waited for the expert to arrive, we realized that through this CoP, we had moved from novice to expert. All we needed to do was claim it.

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# Innovative Field Experiences in Teacher Education: Student-Teachers and Mentors as Partners in Teaching

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This study investigates team teaching between student teachers and mentors during student teachers' field experiences. A systematic literature search was conducted, which resulted into a narrative review. Three team teaching models could be distinguished: (1) the co-planning and co-evaluation model, (2) the assistant teaching model, and (3) the teaming model. Implementing these models during student teachers' field experiences shows benefits for student teachers (e.g., support and professional and personal growth), mentors (e.g., professional and personal growth), and learners in the classroom (e.g., few disciplinary problems and a wide variety of teaching styles). However, disadvantages were found as well. Finally, suggestions for a successful implementation of team teaching were made. By providing an overview of the literature on team teaching between student teachers and mentors, this study contributes to theory development about team teaching. Moreover, it may inspire teacher educators to implement team teaching. Our study may also inspire other higher education programs in which field experiences are essential.

Within higher education, field experiences in placement schools are crucial in preparing future teachers (Kyndt, Donche, Gijbels, & Van Petegem, 2014). While there are differences between teacher training programs in higher education with respect to the scope of field experiences, (e.g., the number and spread of lessons, the type of learners and schools), the underlying concept is generally the same: the student teacher works as a single trainee with an experienced teacher, the mentor (Sorensen, 2014). The field experiences usually start with an observation of the mentor. After this observation period, the student teacher receives the responsibility to individually take over the class during a specific number of hours (Bacharach, Heck, & Dahlberg 2010; Henderson, Beach, & Famiano, 2009). In the meantime, the mentor observes and coaches. His role is mainly being viewed as providing support and instruction through role modeling and feedback (Ambrosetti & Dekkers, 2010). Although the level of collaboration between student teacher and mentor generally remains low, this concept of mentoring student teachers has been successful in the past. Nevertheless, additional learning opportunities may arise through higher levels of collaboration, e.g., co-planning of the lesson, co-teaching during the lesson, or co-evaluating of the lesson. These activities of co-planning, co-teaching, and co-evaluating refer to team teaching, which is defined as "two or more teachers in some level of collaboration in the planning, delivery, and/or evaluation of a course" (Baeten & Simons, 2014, p. 93). Synonyms of team teaching are co-teaching, cooperative teaching, and collaborative teaching (Carpenter, Crawford, & Walden 2007; Chanmugam & Gerlach, 2013; Dugan & Letterman, 2008; Welch, 2002). For reasons of clarity, we consistently use the term "team teaching" in this article.

In the literature several models of team teaching exist which differ in the degree of collaboration among the team teaching partners, for instance, the "one teaching, one assisting" model (Cook & Friend, 1995), the "alternating teaching" model (Dugan & Letterman, 2008), the "parallel instruction" model (Al-Saaideh, 2010), and the "collaborative" model (Hanusch, Obijiofor, & Volcic, 2009). For an overview of these models, see Baeten and Simons (2014).

While review studies have been published on team teaching in higher education (e.g., Anderson & Speck, 1998), on team teaching between general and special education teachers, (e.g., Murawski & Swanson, 2001), and on team teaching between student teachers, e.g., Baeten and Simons, 2014, the literature on team teaching between student teacher and mentor has—to our knowledge—not been systematically reviewed. Two recent review studies showed that the role of the mentor as a team teacher of the student teacher has been rarely reported (Ambrosetti & Dekkers, 2010; Clarke, Triggs, & Nielsen, 2013). Therefore, team teaching between student teacher and mentor remains an area to explore.

Since team teaching between student teachers during field experiences has several benefits, not only for the student teachers themselves (e.g., support and professional growth), but also for the mentor (e.g. learning gains) and the learners in the classroom (e.g., support and rich lessons), it is interesting to examine whether these benefits are also applicable to team teaching between student teacher and mentor. Three research questions (RQ) guide our systematic literature search:

RQ1: Which models of team teaching between student teacher and mentor are present in the literature?

RQ2: What are the reported advantages and disadvantages of these models for the student teacher, the mentor and the learners in the classroom?

RQ3: What are the reported conditions for a successful implementation of these models?

Systematic retrieved information to answer these research questions contributes to theory development about team teaching. Moreover, it may inform teacher training programs in higher education about the benefits and disadvantages of different team teaching models and about conditions for a successful implementation of team teaching. Based on this information, teacher educators can decide which team teaching model(s) they will implement during student teachers' field experiences and anticipate possible disadvantages. Our study may also inspire other higher education programs in which field experiences are essential.

## Research Methodology

In order to answer the three research questions, a literature search was conducted. Three electronic databases were included in the search: Web of Science, ERIC, and FRANCIS. The search terms were "co(-)teaching" and "team teaching" combined with "mentor", "cooperating teacher", "pre(-)service teacher", "classroom teacher", "student teacher", "teacher education", and "teacher training." By reading the abstracts of the retrieved manuscripts, relevant manuscripts were identified. In addition, the reference lists of these manuscripts were explored in order to search for other relevant manuscripts. Criteria for inclusion of manuscripts in the present review study were threefold:

1. In order to grasp an overview of the recent literature, the literature search was limited to the years 2000-2013.
2. In order to ensure the quality of the review study, manuscripts had to be peer reviewed.
3. Manuscripts had to address team teaching between student teacher and mentor during school placements in primary and secondary education.

As a result, 12 manuscripts were included in the review study. These manuscripts were read thoroughly in order to search for patterns in the results with the help of a coding scheme. The coding scheme consisted of four main codes, i.e., team teaching model (RQ1), advantages (RQ2), disadvantages (RQ2), and conditions for a successful implementation (RQ3). Sub-codes were retrieved from the literature (Baeten & Simons, 2014) and further refined based on the data. Examples of sub-codes were:

- Team teaching model, e.g., assistant teaching model, teaming model
- Advantages, e.g., support, professional growth
- Disadvantages, e.g., high workload, unequal task division
- Conditions for a successful implementation, e.g., preparing for new roles, emphasizing dialogue

The coding process was conducted by the first author, who reviewed each manuscript twice. During this process, interpretations of the data were discussed extensively with the co-author. The retrieved information was incorporated into a narrative review, which provides "qualitative descriptions of the findings from literature" (Dochy, Segers, & Buehl, 1999, p. 150). In the Appendix, an overview is provided of the manuscripts included in this review study.

## Research Results

### Which Models of Team Teaching between Student Teacher and Mentor are Present in the Literature?

The Appendix shows that eight of the retrieved studies specify the team teaching model being implemented in the study. Based on these descriptions, three team teaching models come to the fore: (1) the co-planning and co-evaluation model (Chaliès, Bertone, & Flavier, 2008; Nilsson & van Driel, 2010); (2) the assistant teaching model (Eick & Dias, 2005; Eick, Ware, & Williams, 2003, 2004); and (3) the teaming model (Scantlebury, Gallo-Fox, & Wassell, 2008; van Velzen, Volman, & Brekelmans, 2012; van Velzen, Volman, Brekelmans, & White, 2012). The other studies (Carambo & Stickney, 2009; Roth & Tobin, 2001; Roth, Tobin, Carambo, & Dalland, 2004; Tobin, Roth, & Zimmerman, 2001) included in this review do not specify the model being implemented. Instead, in these studies, student teacher and mentor had freedom in shaping their team teaching to fit the circumstances.

**The co-planning and co-evaluation model.** According to the co-planning and co-evaluation model, the collaboration between student teacher and mentor takes place during the planning and evaluation of the lesson. During the delivery of the lesson, only one person (student teacher or mentor) has full responsibility for the lesson (Chaliès et al., 2008; Nilsson & van Driel, 2010). In the study of Chaliès and colleagues (2008), interventions of the mentor in the student teacher's lesson could occur but were limited to interventions that optimize the opportunities for learners to learn new skills.

**The assistant teaching model.** In the assistant teaching model, one person (student teacher or mentor) takes the lead, while the other person assists him during the lesson. In the study of Eick and colleagues (2003), the student teacher first observes and assists the mentor in teaching a lesson. Afterwards, roles are changed and the student teacher takes the lead in teaching segments or an entire lesson with the assistance of the mentor. In the studies of Eick and colleagues (2004) and Eick and Dias (2005), two (instead of one) student teachers are placed as partners with a mentor. First, they both assist the mentor as peripheral participants. Next, one student teacher takes the lead in teaching segments with assistance of the mentor (as equal co-teacher) and the other student teacher (as peripheral participant). Interventions of the mentor consist of adding what might be forgotten, correcting the learners' misbehavior, emphasizing points of learning, gently correcting mistakes, etc. Activities of the peripheral participant include monitoring learners' on-task behavior, assisting learners needing help, making notes that can be used as feedback for the other student teacher, etc. Finally, the student teacher takes the lead in teaching the entire lesson.

**The teaming model.** According to the teaming model, the collaboration between student teacher and mentor takes place during the planning, delivery and evaluation of the lesson (Scantlebury et al., 2008; van Velzen et al., 2012a, b). In the studies of van Velzen and colleagues (2012a, b), the teaming model is part of a teaching cycle consisting of three lessons: the first lesson is taught by the mentor, the second lesson is co-taught by the mentor and the student teacher, and the third lesson is taught by the student teacher. Before the start of this teaching cycle, the student teacher formulates his learning needs together with the teacher educator. Each student teacher participates in two teaching cycles.

## What are the Advantages and Disadvantages of These Models for the Student Teacher, the Mentor, and the Learners in the Classroom?

In this section, (dis)advantages of team teaching between student teacher and mentor are presented for each model: the co-planning and co-evaluation model, the assistant teaching model, and the teaming model. Within each category, the perspectives of student teachers, mentors and learners are studied, in case data on these perspectives were available. As indicated, several studies did not specify the team teaching model. Nevertheless, these studies reported (dis)advantages of team teaching between student teacher and mentor as well. These (dis) advantages are listed below.

**Advantages and disadvantages of the co-planning and co-evaluation model.** Concerning the co-planning and co-evaluation model, advantages were found for student teachers (i.e., *professional* and *personal growth*) and for mentors (i.e., *professional growth*). The retrieved manuscripts did not mention specific advantages for learners. No disadvantages were reported.

***Student teachers.*** The *professional growth* of student teachers is observed through the development of subject-matter knowledge and class management skills during co-planning and co-evaluating with their mentors. During co-planning and co-evaluation, student teachers and mentors discuss what and how to teach, how to ask and respond to questions, how to deal with unexpected events, etc. During these conversations, student teachers learn a lot from their mentors because their mentors know how to handle different situations and how to recognize and interpret critical situations in the classroom. Moreover, they encourage the student teachers to focus on the learner's learning rather than on instruction delivery. Furthermore, after having planned and discussed a lesson with their mentor, student teachers learn while observing their mentors during that lesson (Nilsson & van Driel, 2010).

Besides co-planning and co-evaluating, teaching a lesson in the presence of the mentor is considered important. While teaching, not only the strategies discussed during the co-planning, but also new strategies can be learned and applied. The presence of the mentor encourages the student teacher to experiment with these strategies. These strategies generally relate to pedagogical knowledge, for instance, demonstrate what has to be done by the learners or give responsibility to learners excused from participating in the lesson. In traditional mentoring situations, this type of strategies is less frequently learned (Chaliès et al., 2008).

Besides professional growth, student teachers experience a *personal growth*. When working with mentors for co-planning and co-evaluation, they feel more confident in their teacher role (Nilsson & van Driel, 2010).

***Mentors.*** When co-planning and co-evaluating, not only student teachers but also mentors experience a *professional growth*. Mentors learn much through working with student teachers and through observing their teaching. In this way, they have the opportunity to step back and reflect on another person's teaching through which they can directly verify and develop their own teaching skills. At times, mentors may feel insecure about course contents or new developments (e.g., ICT) and on these occasions, student teachers may explain the contents to them (Nilsson & van Driel, 2010).

The professional growth of both student teachers and mentors not only depends on their collaboration, but also on the interaction with the learners. They both

learn from the learners' explanations and questions, which makes them aware of their own subject-matter knowledge or the lack of it (Nilsson & van Driel, 2010).

**Advantages and disadvantages of the assistant teaching model**. The manuscripts describing the assistant teaching model only report (dis)advantages for student teachers. (Dis)advantages for mentors or learners are not reported. As far as the advantages of the model for student teachers are concerned, three categories can be distinguished: *support*, *professional growth,* and *personal growth*. With the assistance of the mentor in the classroom, student teachers feel comfortable and *supported* in taking the lead in teaching, whether the mentor is highly involved or not. The assistance of the mentor may consist of (a) providing assistance to keep the lesson on track, (b) giving directions to better manage the learners, e.g., during transitional points in the lesson, (c) clarifying concepts and answering learners' questions that the student teacher cannot answer, and (d) handling discipline. The mentor is viewed as the final "back-up" if something fails (Eick et al., 2003).

Besides providing support, the assistance of the mentor contributes to student teachers' *professional growth*. It makes them learn "on the spot" since assistance is given and corrections are made by the mentor when needed rather than after the teaching activity. On the other hand, through heightened observation while assisting the mentor, student teachers have more opportunities to learn what is working and what is not, which stimulates them to critically reflect on the teaching process. As such, they strive to model and improve rather than mimicking the mentor's approach (Eick et al., 2003). Initially, this modeling may be difficult for student teachers as they especially struggle with giving clear and adequate directions to learners before a teaching activity and with questioning about their learning after a teaching activity. Also student teachers' reflections go through a development process. While student teachers initially focus on basic management and discipline issues that require simple answers, they later on reach higher levels of reflective thinking in which a more critical attitude comes to the fore (Eick & Dias, 2005).

A specific characteristic of the approach used in the study of Eick et al. (2003) is the fact that student teachers use the existing lesson plans of the mentors. Consequently, they have more time to focus and reflect on the lesson materials and on the enactment of the lesson. This procedure is appreciated by the mentors since they can go on with their existing lesson plans without interruption despite the internship of the student teacher. One mentor considers this continuity better for the learners in the classroom.

With respect to *personal growth*, student teachers report feeling more confident in teaching and managing the classroom through greater assertiveness because of the presence of the teacher (Eick et al., 2003).

Regarding disadvantages for student teachers, feelings of frustration were reported in case there were changes in the lesson planning, which urged for *last-minute communication* about adjustments to the lesson (Eick & Dias, 2005; Eick et al., 2003).

**Advantages and disadvantages of the teaming model**. The retrieved manuscripts on the teaming model mention advantages as well as disadvantages for student teachers as well as mentors. Advantages of the teaming model for student teachers can be grouped into the following categories: *support*, *dialogue*, and *professional growth*. Advantages for the mentor are *professional* and *personal growth*. Besides advantages, there are some disadvantages, for both student teachers and mentors, e.g., *high workload* and *unequal task division*. First, we will go into advantages for both team teaching partners involved. Next, we will describe the disadvantages.

***Student teachers.*** Collaboration in lesson planning, teaching, and evaluation is appreciated by the student teachers (van Velzen et al., 2012a, b). They experience team teaching as a safe learning environment in which the mentor can *support* them during their teaching practice (Scantlebury et al., 2008; van Velzen et al., 2012a, b). The interventions of the mentor are not experienced as harmful for their own authority. On the contrary, in this way, the learners in the classroom observe that everyone has to learn. In advance, student teacher and mentor may discuss the signals by which they can communicate with each other during team teaching (van Velzen et al., 2012a, b). In the study of van Velzen et al. (2012a, b), only one mentor was reluctant to intervening during the student teacher's teaching practice because the learners in the classroom were not used to this kind of intervention.

The collaboration between student teacher and mentor provides student teachers with plenty of opportunities to share practical knowledge and learn from their mentor. The *dialogue* before and after the teaching practices (i.e., co-planning and co-evaluation) reaches deeper levels, and important issues come earlier to the fore than in traditional mentoring conversations. The focus on the student teacher's learning needs within these conversations is appreciated by both student teachers and mentors and encourages them to discuss additional learning needs arising from practice. Also the mentors and teacher educators appreciate the increased communication and the focus on the student teacher's learning needs (van Velzen et al., 2012a, b).

Further, the use of the teaming model contributes to the *professional growth* of the student teacher. During team teaching, student teachers have many opportunities to practice distinct components of teaching (van Velzen et al., 2012a, b) and, subsequently, they reach several learning gains (e.g.,

generating new ideas and enriching existing curricula) (Scantlebury et al., 2008).

***Mentors.*** Not only student teachers but also their mentors appreciate the collaboration in lesson planning, teaching, and evaluation. Mentors learn from their student teachers, which contributes to their own professional growth (Scantlebury et al., 2008; van Velzen et al., 2012a, b). They discuss new approaches induced by the student teachers (e.g., the use of activating teaching methods and ICT) and implement them in their own teaching practice (van Velzen et al., 2012a, b). Compared to mentors, student teachers often have more recent subject knowledge and technical skills which can generate new ideas for the mentors and enrich their curricula (Scantlebury et al., 2008).

In addition to a professional growth, a *personal growth* of mentors becomes apparent because their expertise in training student teachers is valued (van Velzen et al., 2012a, b). Throughout the cyclical process taking place in the study of van Velzen et al. (2012a, b), mentors begin to recognize and value their practical knowledge, which improves their self-confidence. However, mentors also report that it is not always easy to substantiate their ideas. Also, showing the desirable teaching behavior related to the learning needs of the student is not always easy (van Velzen et al., 2012a, b).

A first disadvantage of the teaming model for both student teachers and mentors is a *high workload.* The planning and evaluation of team teaching take more time than in traditional mentoring situations (van Velzen et al., 2012a, b). A second disadvantage is an *unequal task division.* Mentors consider it to be difficult to step back and provide opportunities for the student teacher to step up and take co-responsibility. They easily take an equal responsibility for the instructional part of the lesson but an equal responsibility for classroom authority issues evolves more slowly. In addition, according to student teachers, mentors may regularly come to the planning sessions with the lessons already prepared. Mentors, on the other hand, report that student teachers have a tendency to come to class unprepared (Scantlebury et al., 2008).

**Advantages and disadvantages of other models of team teaching between student teacher and mentor.** In the studies of Carambo and Stickney (2009), Roth et al. (2004), Roth and Tobin (2001) and Tobin and colleagues (2001), which do not specify a particular team teaching model, several advantages of team teaching are reported. Advantages for the student teacher are *support*, *dialogue*, *professional* and *personal growth*. Advantages for the learners in the classroom are a *high engagement*, *few disciplinary problems* and an *acquaintance with a wide variety of teaching styles*. Disadvantages for both student teachers and mentors are a *limited freedom* and a *lack of compatibility*.

***Advantages of other models of team teaching between student teacher and mentor.***

*Student teacher*. Thanks to team teaching, the mentor can provide (professional) *support* to the student teacher (Tobin et al., 2001). For instance, if the student teacher does not know how to present a new topic, the mentor can intervene and move the lesson into a new direction. For the student teacher, moving the lesson in new directions is more difficult because on his own, he has fewer actions available to implement in a lesson. In case of team teaching with a mentor, he has more actions available because the actions of the mentor provide supporting resources (Roth et al., 2004).

Besides support, team teaching has lots of potential for *dialoguing*. The team teachers experience the same situation and look at it from the inside (as a teacher in front of the classroom). As a consequence, they have shared experiences to talk about. During these conversations, differences in perceptions become apparent and stimulate changes in the teaching practice (Roth & Tobin, 2001). Moreover, the sharing of ideas about lesson plans is appreciated by student teachers (Tobin et al., 2001).

During team teaching, the professional relationship of the student teacher with the mentor enhances the development of their teaching practice and the quality of their interactions in the classroom (Carambo & Stickney, 2009). This *professional growth* can be due to the fact that in team teaching, there is the possibility to observe different teaching styles and to openly critique, assess, and receive (constructive) feedback. Consequently, student teachers are encouraged to try methods that they previously did not use (Tobin et al., 2001). Since the mentor always can step forward and provide additional learning opportunities for the learners in the classroom, the student teacher also learns what can be good teaching at a particular moment (Roth & Tobin, 2001). Moreover, student teachers learn to collaborate as a team (Tobin et al., 2001). Roth and colleagues (2004) report that after a while, team teachers have a tendency to act in the same way.

Further, through the presence of the mentor as a team teacher, student teachers experience *personal growth*. They feel confident in trying new approaches and asking for an honest critique. If the student teacher were solely an observer or part-time participant, this might have been more intimidating (Tobin et al., 2001).

*Learners.* With regard to the learners, the presence of multiple teachers in the classroom encourage a *high engagement*. Learners pay more attention, there is more activity and less time gets lost (Carambo & Stickney, 2009). Moreover, there are *few disciplinary problems* (e.g., learners being inattentive or evoking commotions) (Roth et al., 2004; Tobin et al., 2001) and learners are

being *confronted with a wide variety of teaching styles* (Tobin et al., 2001).

***Disadvantages of other models of team teaching between student teacher and mentor.*** A first disadvantage for the team teachers refers to the fact that there is *limited freedom* in teaching the learning contents since agreements need to be made between the team teachers (Tobin et al., 2001). Moreover, teaching with a mentor limits the diversity of events that arise in the classroom. When the student teacher is alone, he will learn more (Roth & Tobin, 2001).

A second disadvantage refers to situations in which team teachers have very different views on the content or teaching practice and where there is a *lack of compatibility* between them. This may result in friction unless there is sufficient and open communication. In the latter case, these differences are an advantage and may enhance reflection and exchange of ideas (Carambo & Stickney, 2009). Figure 1 gives an overall overview of the advantages and disadvantages of the different team teaching models.

## What are the Conditions for a Successful Implementation of these Models?

We grouped the conditions for a successful implementation of team teaching between student teacher and mentor into four categories: (1) preparing student teachers and mentors for their new roles; (2) emphasizing dialogue between team teaching partners; (3) developing relationships characterized by openness, trust, respect, and equity; and (4) investing time in team teaching.

**Preparing student teachers and mentors for their new roles.** Mentors generally take up the role of observer and coach of the student teachers and are therefore not used to team teach with them (Chaliès et al., 2008), so particularly mentors experience difficulties in adapting to their new role of team teacher (Roth & Tobin, 2001). They have to learn to take a step back and to support the student teachers who take up the role of equal team teacher (Scantlebury et al., 2008). Therefore, they have to learn how to make their teaching knowledge explicit, for instance, by observing their own teaching practice and explaining what they are doing and why (van Velzen et al., 2012a). Besides taking up a new role, it is important that they dialogue about this role with the student teacher (Roth & Tobin, 2001).

In order to be prepared for team teaching, student teachers must study the content of the team-taught lessons in advance. If they are not familiar with the topic, they may be hesitant and unsure, and they may not be able to respond to the learners' questions. In this case, their confidence may suffer seriously. In case student teacher and mentor do not co-plan and student teachers are insufficiently prepared, the transition to team teaching can be difficult (Eick et al., 2004).

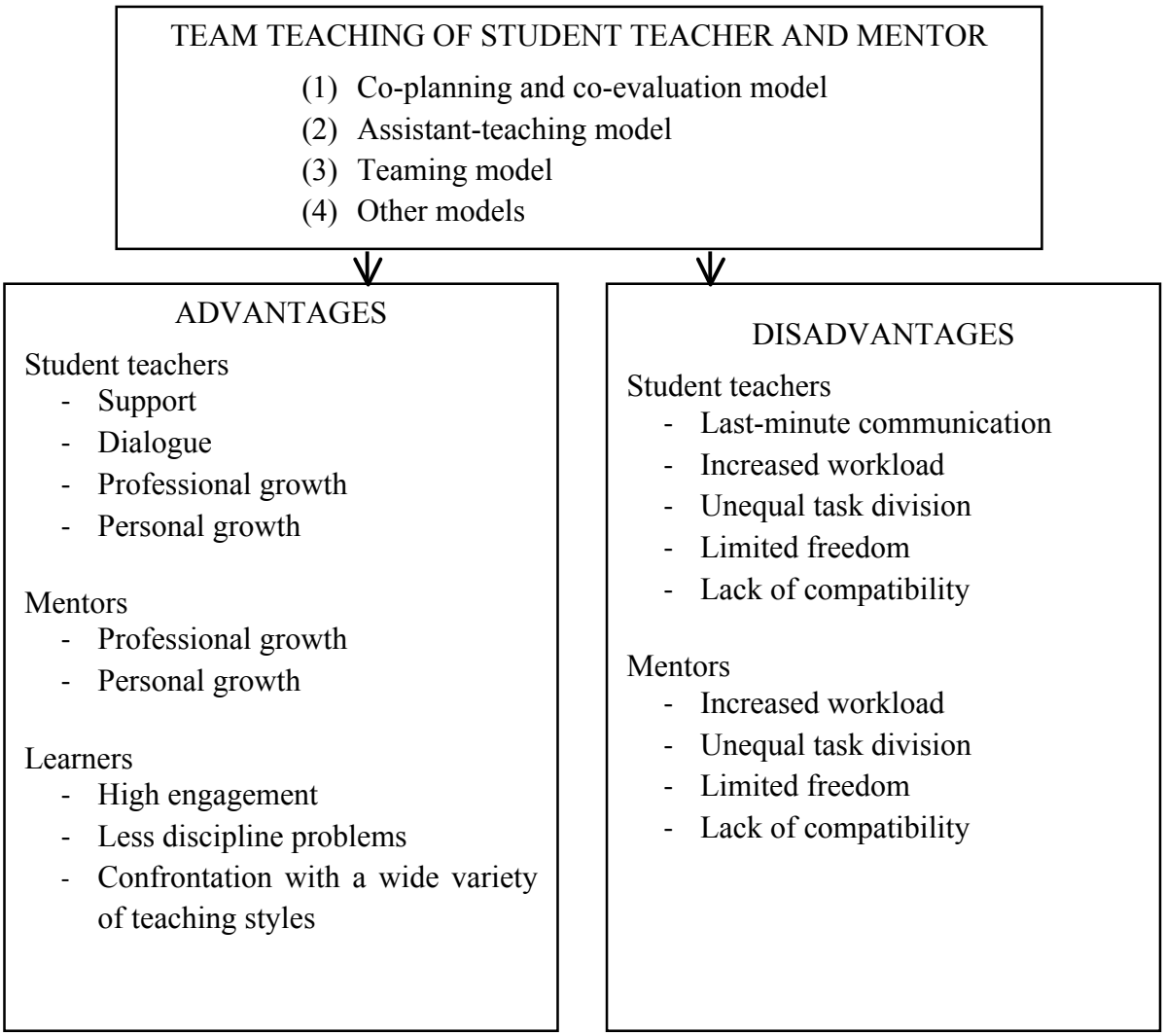
**Emphasizing dialogue between team teaching partners.** Dialogue among team teaching partners is perceived to be crucial for successful team teaching, both by student teachers and their mentors, since learning does not only occur during teaching but also during dialoguing (Eick et al., 2003). It has been advised that mentors communicate and discuss their lesson plans and learning materials to the student teachers in advance so that they are sufficiently prepared (Eick et al., 2003, 2004). Their lesson plans should be detailed enough since student teachers need more structure about lessons than experienced teachers do (Eick et al., 2004). Changes in lesson plans may occur, for instance because of adjusting pacing and schedule interruptions, which stresses the need for last-minute communication between the partners. Eick et al. (2003) report that student teachers experience this type of communication as very frustrating. Moreover, mentors should share classroom policies and other duties that go with teaching, for instance, disciplining learners, passing out papers, assisting with lunch duty, grading papers, and doing paperwork (Eick et al., 2004). Only in this way student teachers can fully participate as team teaching partners.

It is also important that both partners meet after team teaching to share constructive feedback with the aim of improving their teaching practice (Eick et al., 2004). Co-generative dialogue is an interesting tool to do so (Carambo & Stickney, 2009). This type of dialogue is an open discussion among the team teaching partners based on shared experiences (e.g., a lesson, an assessment) with the aim of changing and improving teaching and learning (Copping, 2012; Scantlebury et al., 2008). The strength of a co-generative dialogue is that all members (team teachers but regularly also a selection of learners) reflect on common objects, often replayed using videotapes of the lesson, and that the views of all participants are valued. In this respect, ideas for improvement (what worked and what did not work) are co-generated (Tobin & Roth, 2005). This kind of conversation encourages students to think deeply about their teaching (Eick et al., 2004). If team teaching takes place over consecutive days, the dialogue can be more productive and richer (Eick et al., 2003).

Besides the meetings before and after the lessons, mentors and student teachers should meet at other points in time in order to get to know each other and talk informally about teaching, for instance, eating lunch together or carpooling (Eick et al., 2004; Scantlebury et al., 2008).

**Developing relationships characterized by openness, trust, respect, and equity.** Besides providing sufficient opportunities for dialoguing, the quality of the relationship between the team teachers is important. It should be characterized by openness.

Figure 1
Overview of (dis)advantages of team teaching between student teacher and mentor.




Since team teaching involves collaboration in the classroom and student teachers being more than simply passive observers, it requires a risk-taking attitude from mentors. Mentors should be willing to demonstrate and discuss their own teaching practices and to learn from student teachers. Moreover, they should be able to make practical knowledge explicit and to withhold their judgment on student teachers' ideas and activities (van Velzen et al., 2012a, b).

Further, there should be trust (van Velzen et al., 2012a, b) and mutual respect between the team teachers, which encourages communication, the sharing of ideas, and the openness to constructive criticism (Scantlebury et al., 2008).While one teacher is teaching, the other can verbally interject, (e.g., adding what might be forgotten, gently correcting a mistake, emphasizing a point of learning, or correcting student misbehavior). These interjections should feel natural and may not be considered as a way to critique or embarrass the teacher. Both partners should feel free to interject but always must give the lead teacher the chance to teach first (Eick et al., 2004).

In addition, both partners should consider each other as equal peers who can provide valuable insights and knowledge. Both mentor and student teacher share equal roles in co-planning, co-teaching, and/or co-evaluating. It may be difficult for mentors to accept this equal role sharing with a student teacher who is just starting his internship (Eick et al., 2004). If mentors position themselves as more powerful (e.g., by not

equally sharing the preparation or by excluding student teachers from decision-making processes), student teachers loose respect for them (Scantlebury et al., 2008).

**Investing time in team teaching.** Team teaching between student teacher and mentor requires time to be successful. Since both partners are not used to team teaching, it takes time to develop a constructive, professional relationship (Chaliès et al., 2008). Both partners have to get used to each other's teaching style (Eick et al., 2004). Further, it has been suggested that dialogues could be richer if team teaching takes place over consecutive days (Eick et al., 2003). Therefore, it seems important to spread team teaching over time. In addition, team teaching is time intensive, for instance, due to the frequent conversations taking place (van Velzen et al., 2012b). Nevertheless, it is considered a way to become more conscious of the way teachers act and think (van Velzen et al., 2012).

## Conclusions and Discussion

The present study focuses on innovative field experiences in the teacher training program. In particular, the literature on team teaching between student teacher and mentor was systematically reviewed. The literature search shows that team teaching between student teacher and mentor can take place by means of different models, e.g., the co-planning and co-evaluation model, the assistant teaching model, and the teaming model. While only one teacher has the teaching responsibility in the co-planning and co-evaluation model, the teaching responsibility is divided among the team teaching partners in the assistant teaching model and the teaming model. In the assistant teaching model, one teacher has the primary responsibility while the other assists. In the teaming model, both teachers share equal responsibility in the planning, delivery, and evaluation of the lesson.

Introducing team teaching of student teacher and mentor during field experiences entails several advantages for the actors involved, i.e., the student teacher, the mentor and the learners in the classroom. Through team teaching with a mentor, student teachers feel supported. They have ample opportunities to dialogue with the mentor and experience a professional growth, (e.g., class management skills) and a personal growth (e.g., self-confidence). Mentors also report increases in their professional growth (e.g., recent subject knowledge) and their personal growth (e.g., self-confidence), and learners show a high engagement in the course, experience few disciplinary problems, and get to know a wide variety of teaching styles. Nevertheless, disadvantages are reported as well, both for student teachers and mentors, e.g., they experience a high workload, an unequal task division, and limited freedom during team teaching. In addition, a lack of compatibility between student teacher and mentor may cause problems.

Notwithstanding the disadvantages, team teaching between student teacher and mentor seems to be beneficial. Therefore, it may be encouraged to implement this kind of teaching during field experiences in teacher training programs. A combination with individual teaching seems appropriate since for some student teachers it may be more effective to plan and teach individually (Eick et al., 2004). When implementing team teaching, it is important to prepare both team teaching partners for their new roles, to emphasize dialoguing between the partners, to develop relationships among the partners that are characterized by openness, trust, respect and equity and to invest time in team teaching.

Due to the lack of research on team teaching between student teacher and mentor, it might be difficult to convince mentors to team teach with a student teacher. Mentors have often worked autonomously for many years, and in team teaching, they need to share the teaching space (Scantlebury et al., 2008).This review study, showing the benefits of team teaching, could be a first step in convincing them to team up with a student teacher.

Despite the added value of this study to the team teaching literature, some limitations can be acknowledged. First, for each model several perspectives and (dis)advantages were studied. If a perspective or a (dis)advantage has not been reported for a model, this does not mean that the (dis)advantage does not apply to the model. It could be that it has simply not been investigated. Secondly, the perspective of the teacher educator has been neglected. The empirical studies mainly focused on the student teachers, mentors, and learners. This may be explained by the fact that the teacher educators were not directly implicated in the team teaching. Thirdly, since a narrative review is based on the reviewers' intuitive process, it is possible that our own views may have influenced our interpretations of the literature. Nevertheless, a narrative review makes it possible to give in-depth information about a topic (Dochy et al., 1999).

Notwithstanding the limitations, the present review gives a systematic overview of models of team teaching between student teacher and mentor, their (dis)advantages, and conditions for implementation. In this way, our study may inspire teacher educators to implement team teaching between student teacher and mentor in the future. Moreover, based on the current literature review, several guidelines for further research can be formulated. First, the studies included in the review all made use of qualitative data analysis methods. Therefore, it would be complementary to

corroborate these findings with quantitative studies. Secondly, most studies took place in science education. It would be interesting to investigate whether the findings are generalizable to other subjects as well. Thirdly, all studies took place on a small scale. Conducting a large-scale study could strengthen the findings. Fourthly, the studies focused on the implementation of team teaching without comparing it with a control group. Consequently, there is a need for more quasi-experimental research on the effectiveness of team teaching between student teachers and their mentors (Carpenter et al., 2007; Murawski & Swanson, 2001; Welch, Brownell, & Sheridan, 1999), for instance, comparing different models of team teaching or comparing team teaching and individual teaching. Fifthly, there is a need for research focusing on the conditions that influence the learning process of student teachers during team teaching (Dang, 2013; Gardiner & Robinson, 2009) and on the effects of team teaching on student teachers' achievement (Carambo & Stickney, 2009). Sixthly, longitudinal research investigating the effects of team teaching on the future teaching career (Nokes, Bullough, Egan, Birrell, & Hansen, 2008) may be interesting. Finally, it would be interesting to investigate models of collaboration between mentor and mentee in other fields of workplace learning in higher education.

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Appendix
Studies Included in the Review Study

| Author | Model | Aim / Research questions | Subjects | Data collection | Data analysis | Control group? |
|---|---|---|---|---|---|---|
| Carambo & Stickney (2009) | No model specified | - Experiences of the academic coordinator and mentor teacher of the learning community in which two student teachers completed their teaching practice. | - Student teachers and their mentors | - Theoretical paper | / | / |
| Chaliès et al. (2008) | Co-planning and co-evaluation model:<br>1. The mentor observes one lesson of the student teacher<br>2. Co-preparation: They both evaluate the lesson of the student teacher and prepare the next lesson<br>3. Teaching: the student teacher has full responsibility for managing the lesson<br>4. Co-evaluation of the lesson | - Evaluating the advantages and limits of a collaborative mentoring sequence regarding the rules learned and/or used by the student teacher.<br>- Identifying the two circumstances that most favored the student teacher's professional development. | - 1 student teacher and his mentor<br>- Pair<br>- Secondary education (physical education) | - Video-taping of the lesson, co-preparation, co-teaching, co-evaluation<br>- Interviews with student teacher and mentor (separately) about video-taped data | Qualitative | No |
| Eick et al. (2003) | Assistant-teaching model: Co-teaching by observing and assisting the mentor, afterwards taking the lead with assistance of the mentor | - What aspects of domain-specific knowledge from authentic practice could student teachers develop from this co-teaching experience?<br>- What advantages and disadvantages do mentor and student teachers see from this co-teaching approach?<br>- How do these student teachers reflect on their ability to implement inquiry-based forms of teaching in the context of co-teaching? | - 10 student teachers and their mentors<br>- Pair<br>- Secondary education (science education) | - Observation of the co-teaching arrangement<br>- Field notes (classroom dialogues, interactions, …)<br>- Reflective journal (student teachers)<br>- Questionnaire (student teachers and mentors) | Qualitative | No |

| Author | Model | Aim / Research questions | Subjects | Data collection | Data analysis | Control group? |
|---|---|---|---|---|---|---|
| Eick et al. (2004) | Assistant-teaching model: Co-teaching by observing and assisting the mentor, afterwards taking the lead with assistance of the mentor and a fellow student teacher | - Developing a primer for mentors and student teachers with information and suggestions for them to follow in making the co-teaching model more effective in learning to teach. | - Student teachers and their mentors<br>- Triad (two student teachers and one mentor)<br>- Secondary education (science education) | - Theoretical paper | / | / |
| Eick & Dias (2005) | Assistant-teaching model:<br>Co-teaching by observing and assisting the mentor, afterwards taking the lead with assistance of the mentor and a fellow student teacher | - How does methods student thinking about practice and structured inquiry change over time through authentic practice in this co-teaching model?<br>- How does learning to teach in this co-teaching model utilize methods students' past and ongoing educational experience in developing practical teacher knowledge for using structured inquiry? | - 11 student teachers<br>- Triad (two student teachers and one mentor, 1 student teacher did not have a partner)<br>- Secondary education (science education) | - Observation of the co-teaching arrangement<br>- Field notes (classroom dialogues, interactions, …)<br>- Electronic dialogue journal (student teacher)<br>- Final reflective summary (student teacher) | Qualitative | No |
| Nilsson & van Driel (2010) | Co-planning and co-evaluation model: Co-planning, teaching (both student teacher and mentor are present but only one is responsible for the lesson), co-reflecting/evaluation | - What knowledge do student teachers develop from their mentors while jointly planning and reflecting on each other's science lessons?<br>- What knowledge do mentors develop from student teachers while jointly planning and reflecting on each other's science lessons?<br>- What knowledge do student teachers and mentors develop through interaction with students? | - 2 student teachers and their mentors<br>- Pair<br>- Primary education (science education) | - Video-taping of lessons<br>- Stimulated recall sessions on the video-taped lessons<br>- Tape recording of planning sessions and stimulated recall sessions<br>- Written reflections of student teachers and their mentors | Qualitative | No |
| Roth & Tobin (2001) | No model specified | - Developing co-teaching as praxis and conceptual framework. | - Student teachers (university) and their mentors<br>- Pairs & triads<br>- Secondary education (science education) | - Vignettes | Qualitative | No |

| Author | Model | Aim / Research questions | Subjects | Data collection | Data analysis | Control group? |
|---|---|---|---|---|---|---|
| Roth et al. (2004) | No model specified | - Exploring how the teaching practices of an experienced mentor provide resources for his intern co-teacher to learn to teach by teaching, employing central and peripheral roles | - 1 student teacher and his mentor<br>- Pair<br>- Secondary education (science education) | - Observational, methodological, and theoretical field notes<br>- Videotaping of lessons and co-generative dialogue sessions<br>- Interviews with the student teacher and the learners<br>- Collecting the teaching-related discussions student teachers held using an online internet forum<br>- Journal of the student teacher<br>- Reflections on teaching and on the lesson plans | Qualitative | No |
| Scantle-bury et al. (2008) | Teaming model | - What were the model's characteristics that afforded or hindered co-teaching?<br>- Are these characteristics aligned? If so, what are their relationships in practice?<br>- How can teacher educators support the successful implementation of the co-teaching model? | - 6/9 senior-year student teachers (university), mentors, teacher educators<br>- A combination of at least two peers and two mentors<br>- Secondary education (science education) | - Interviews (student teachers, mentors, teacher educators)<br>- Observations | Qualitative | No |
| Tobin et al. (2001) | No model specified | - Experiences of a student teacher who is assigned for his field experiences to an urban high school. | - 2 student teachers and co-teachers (mentor, university supervisor, high school students)<br>- Pairs, triads, quartet<br>- Secondary education (science education) | - Video-taping of the analysis session/verbal interactions/co-generative dialogues<br>- Recording debriefings<br>- Reflections in journals<br>- Face-to-face and e-mail interactions | Qualitative | No |

| Author | Model | Aim /Research questions | Subjects | Data collection | Data analysis | Control group? |
|---|---|---|---|---|---|---|
| van Velzen et al. (2012a, b) | Teaming model: A cycle of 3 lessons: (1) a lesson given by the mentor; (2) a lesson given by the mentor and the student teacher; (3) a lesson given by the student teacher. | - How do mentors, student teachers and school-based teacher educators assess the effectiveness of the collaborative mentoring approach and its components as means of guided work-based learning?<br>- Which conditions contribute to the effectiveness of the collaborative mentoring approach according to the participants? | - 3 teams consisting of 1 student teacher, 1 mentor and 1 school-based teacher educator<br>- Triads<br>- Secondary education (chemistry, geography, English) | - Semi-structured interviews (student teachers and mentors)<br>- Group interviews (mentors and school-based teacher educators)<br>- Questionnaire (student teachers)<br>- Logbooks (student teachers and mentors)<br>- Portfolio's (student teachers)<br>- Audio-taping of the conversations about the concept maps | Qualitative | No |

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# Developing Independent Listening Skills for English as an Additional Language Students

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This paper describes an action research project to develop online, self-access listening resources mirroring the authentic academic contexts experienced by graduate university students. Current listening materials for English as an Additional Language (EAL) students mainly use Standard American English or Standard British pronunciation, and far fewer materials use Australian or regional accents. Materials are also simplified or spoken at a slower speed, emphasizing comprehension-type questions, despite the fact that literature reveals effective listening development involves practice in real-life listening contexts. Academic listening materials conversely emphasize the formal lecture and development of note-taking skills. We developed a range of activities where listening input was accompanied by materials reflecting top-down and bottom-up strategies as well as other cognitive and meta-cognitive skills. Materials were developed over two action research cycles involving EAL research student participants. Paper-based exercises were trialed and then developed into online materials where students could create their own listening materials and build portfolios. Results from the participants in the workshops/focus groups indicate they were able to develop their listening skills independently because of the explicit and focused approach of the materials. However, even more explicit and simple instructional design was needed when translated into the online environment.

Listening comprehension is a vital skill in all areas of academic life. Effective listening is required in order for higher education students to understand formal lectures and tutorials, as well as to interact with other students in small groups, in project work, and in social situations. Graduate students have the added challenge of participating in a range of informal interactions in laboratories, in supervision meetings, at conferences, at public lectures, and in communication with research participants. Therefore, in order to transition into an academic English learning environment, international and other English as an Additional Language (EAL) students require both formal note-taking skills and informal, real time, interactive listening skills.

Research has suggested that international EAL students experience significant challenges as a result of differences in culture and language and that they struggle to integrate with their local peers (Barron, Gourlay, & Gannon, 2010). Developing the listening skills that will facilitate effective integration into the local university and external environment can be particularly daunting for EAL students studying outside of North America or the United Kingdom who also have to contend with the added challenge of becoming familiar with the new accent. These accents are often unfamiliar to international EAL students because their previous exposure to western English accents has been largely confined to Standard North American English (SAE) and Received Pronunciation (RP) (also called BBC English) British accents in the popular media. In addition, an examination of English listening materials reveals that there is a predominant slant towards the creation of materials that reflect SAE and RP accents.

University academic staff often find catering to a rapidly increasing international student cohort challenging: they experience difficulties meeting students' academic and linguistic needs and require additional support from academic developers (Barron et al., 2010). With large cohorts and significant student needs, online language support is often heralded as a viable option. Currently, there is a wide range of EAL listening material embedded in textbooks, DVDs, and online. However, this material often involves simplification with an emphasis on answering basic comprehension questions which does little to facilitate the range of high level skills required in authentic academic listening contexts. This is also the case in the Australian context where this study was conducted.

In Australian pre-enrollment English programs, EAL teachers have relied for some time on the materials created by a company called JANCO for naturalistic listening materials to prepare students for listening in everyday contexts. These materials ask questions based on the Australian Broadcasting Corporation (ABC) program *Behind the News* (BTN). Although useful for low-level learners, the television program itself is aimed at Australian primary school children. Therefore, the content is inappropriate for adult learners, and the speed and simplicity of the delivery does not mirror the real life experiences that students will face when studying in Australia, especially in research contexts.

The current academic English offerings likewise do not reflect the real-life communication scenarios faced by EAL students in an Australian university. An examination of academic English listening materials reveals that the listening activities are "cleaned up" for

publication, do not fully replicate the lecture/ tutorial environment, and emphasize the answering of comprehension questions. In addition, there is no opportunity for renewal and for students to collect and explore their own listening portfolio. Finally, the currently available material focuses on pre-enrollment students.

A review of post-enrollment materials currently available online and in advertised workshops conducted by academic developers at Australian universities reveals that very little emphasis is placed on listening skills. The limited offerings available, such as note-taking workshops, focus on formal lectures rather than other less structured contexts, yet anecdotal evidence suggests that many students experience problems listening in academic contexts outside of formal lectures, particularly in their interactions with other students, lecturers, and the public. Another major element missing in listening materials is that they tend to be static and focused on materials or contexts determined by the academics developing them. This contrasts with trends in online learning that suggest that "21st century learners" require resource delivery that is "just enough, just in time, and just for me" (Peters, 2007, p. 1)

To address this need, we undertook a research project to develop a range of online self-access materials for EAL undergraduate and graduate learners which they could use as much as they needed when they needed and included the content that they needed. These materials were informed by a thorough review of the relevant literature, are based on an understanding of the variety of academic listening contexts faced by students, and follow best-practice for online learning material development. They were refined through two cycles of participatory action research.

## Research Procedure

Participatory action research was selected as a mode of inquiry for this study since it is a method grounded in practical action aimed at solving immediate problems and at the same time developing theory (Baskerville, 1999). Participatory action research involves and engages all stakeholders (Zuber-Skerrit, 2002), thus it is appropriate for solving an issue relevant to all stakeholders in the development of listening skills for university students. Participatory action research requires the commitment of participants to be effective (Greenbank, 2007). We engaged international graduate research students participating in a researcher education program in the study since they had identified listening as a particular challenge preventing their effective integration into their disciplinary communities and in communication with the public in research activities. Thus it was in the interest of the participants to develop a tailored solution to their immediate challenges. Also, this is a cohort rarely targeted in EAL listening materials. All the graduate students in the researcher education program over the period 2011 and 2012 were actively informed of the process, and they directed the focus of the research throughout in the form of active data collection on large sheets of butcher's paper in the focus groups and commenting and clarifying data presented to them by the two lecturers/primary researchers. The research was developed in two cycles since, according to Melrose (2001), rigor in action research and better practice are enhanced through more than one cycle, including critical reflection and evaluation of current practices. We therefore followed the steps for participatory action research outlined by Drummond and Themessl-Huber (2007) in each cycle:

1) Identification of the issue (and refinement based on the relevant theory)
2) Implementation of initial intervention strategy
3) Evaluation of results
4) Further expansion and refinement
5) A new action research cycle development

The results of the two action research cycles and the steps followed within each cycle are described below in the text and summarized in Table 1 below.

### Cycle 1: Development of Listening Strategies and Materials

**Identifying an issue and appropriate theory.** Research students (n = 72) responded to a question on their most significant research communication challenges and training needs as part of questionnaire evaluating a researcher education program for international graduate research students over two semesters in 2009. This formed part of the standard evaluation cycle for the program. Although the participants responded positively regarding the writing and speaking component of the program, they reported that they had significant unmet needs regarding listening in academic contexts and during data collection interactions with the public (Velautham & Picard, 2009). This finding was confirmed in focus groups of research students which were conducted in their seminar groups by the two lecturers who taught the program in 2011 over three semesters and who performed the dual role of researchers and lecturers. This program utilized a unique pedagogy with the students where they were treated as "collaborating colleagues" (Velautham & Picard, 2010, p. 624). In this pedagogical approach, it is customary for the students to negotiate their own curriculum based on the needs of all students in a disciplinary/paradigm group. The participants were presented with the findings of the

Table 1
*Summary of Participatory Action Research Cycles, Procedure Followed, and Timelines*

| Action Research Cycle Element | | Procedure Followed | Timeline |
|---|---|---|---|
| Participatory Action Research Cycle 1 | | | |
| 1 | Identify issue (and refine based on the relevant theory) | a) Questionnaire on research communication challenges and needs submitted to all EAL students in a researcher education program | a) 2009 |
| | | b) Initial literature review conducted | b) 2010 to 2011 |
| | | c) Focus groups with program participants over 3 semesters | c) March to December 2011 |
| 2 | Implementation of initial intervention strategy | a) Confirmation of areas of need for intervention in focus groups over 3 semesters | a) March to December 2011 |
| | | b) Design of initial activities | b) December 2011 to March 2012 |
| | | c) Presentation of paper-based activities: *Listening for details; Word Segmentation, Decoding Accents, Prediction and Structure of Discourse,* and *Understanding Inferences* in 2 seminars over a semester | c) March to May 2012 |
| | | d) Feedback received in two lectures from focus groups on butcher's papers | d) March to May 2012 |
| 3 | Evaluation of results | a) Results processed by primary researchers/lecturers | a) May to June 2012 |
| 4 | Further expansion and refinement | a) Development and trialing of *Everyday Listening* website and materials emails sent to all participants in c. 10 responses received in Seminar group and 20 via e-mail. | a) June to August 2012 |
| Participatory Action Research Cycle 2 | | | |
| 1 | Identify issue (and refine based on the relevant theory) | a) Need to evaluate online environment and use more carefully identified by primary researchers and confirmed with participants in 4 of Cycle 1. | a) June to August 2012 |
| 2 | Implementation of initial intervention strategy | a) Everyday website and materials developed in Cycle 1 introduced and trialled with two new groups of participants in Lectures | a) August to December 2012 |
| 3 | Evaluation of results | a) Focus groups held at the end of the lectures and in seminar groups with the whole group (40 out of 42 responses received) as well as 4 negotiated participants who did not attend the lectures/seminars, but completed activities | a) August to December 2012 |
| 4 | Further expansion and refinement | a) Instructions refined and additional file formats for the uploading of listening portfolio materials provided, materials changed to different software format for ease of use. Timer added, but later removed on advice from participants. | a) December 2012 to March 2013 |

initial questionnaire and were asked to specify the communication issues indicated in the questionnaire data and otherwise that most significantly impacted on their learning as graduate students, as well as provide the reasons for this. The participants (n=120) overwhelmingly reported that despite receiving high listening scores in international language examinations, they had difficulty listening in unstructured contexts where they were only able to listen once and there were other distractions.

As recommended by Drummond and Themessl-Huber (2007), the two researchers, who are also lecturers in the research communication program, conducted a literature review to develop theory on the topic. We searched the University's library database which includes access to all the major Language and Education databases (such as Google Scholar and Academic Search Premier). The researchers used a very general search term "listening" in the first instance, since the field of listening research is extremely broad. Thereafter, the researchers limited the search to the following fields: "listening comprehension", "communication," "teaching methods," "ESL learning," "academic achievement," and "students." Fields such as "school children" and "social justice" were removed. The search parameters were also limited to research articles. Then, the timeline for publications was refined to 1990 to 2012. A total of 1257 articles were identified through this process and key authors were located. The researchers read the abstracts of all the articles and further refined the data to those referring to post-school level students. Finally over 300 journal articles were identified and key authors cited were highlighted. This lead to the identification of the three key review articles described below. A search for journals with "listening" included in the title was also made in the library database. Only four journals were found, and these were found to focus on children's listening and health rather than adult learners. A general literature review, followed by more details on specific issues identified in the literature, is presented below.

**Listening: a general literature review.** The review described above identified three landmark review articles on the teaching of listening to EAL learners between 1990 and 2012 which summarize the main trends in listening research relevant to students with English as an additional language: Rubin's review of listening comprehension research in 1994, Van der Grift's article focusing on more recent developments in the field in 2007, and Lynch's comprehensive analysis of a decade of academic listening research in 2011. Unfortunately, the literature on this skill has remained limited with all three reviewers noting its under-researched status. They further expound on the difficulties associated with researching and teaching listening, including the interrelatedness of listening with other language skills and the influence on listening of linguistic, social, and cultural factors related to the listener, context, interlocutor, and the nature of the text or interaction. In terms of teaching listening processes, all noted the importance of teaching both top down strategies ("knowledge of the world, situations, and roles of human interaction" (Rubin, 1994, p. 210) and bottom-up strategies ("knowledge of words, syntax, and grammar" (Rubin, 1994, p. 210) and the importance of this processing happening simultaneously. Rubin (1994) also noted the need for more research into a top-down understanding of text genre.

This call was taken up as noted in the subsequent reviews with a number of studies describing the effect of different text genres on students' performance in listening assessments in controlled experiments (Lynch, 2011; Vandergrift, 2007). This awareness of text-type has also impacted the teaching of listening with the application of the genre based approach which unpacks the rhetorical and characteristic language structures in listening texts in order to assist in academic note-taking (Flowerdew & Miller, 2010).

Another issue described by Van der Grift (2007) and Lynch (2011) is the fact that the nature of formal lectures has changed dramatically over the past decade. Students are now just as likely to receive input from competing media and experience workshops or even task-based collaborative learning environments as a formal lecture. Even the lecture format has changed with PowerPoint slides and video clips now standard fare in large lectures. This is confirmed in a study by McKnight (2004) who found that students who attended lectures devoted their attention to copying material that was visually depicted instead of listening to the lecture.

Despite this new awareness of the changes in, and effects of, listening text-type, little advice is given to pre-enrollment English for Academic Purposes (EAP) teachers. Even less advice is provided for academic developers post-enrollment or to the university students who are attempting to develop the required variety of listening skills. The EAP literature focuses on testing and manipulating variables for various levels of competency and to ensure test validity, while the academic development literature emphasizes reading and writing or formal oral presentation skills.

Because of this lack of theoretical and pedagogical input, EAP teachers and academic developers are reduced to relying on English textbooks which contain manipulated mini-lectures based on assumptions of micro and macro skills (Goh, 2002; Van der Grift, 2003). These often use genre theory, but then expect students to extrapolate classroom exercises to real academic situations. This is an unrealistic approach because textbook materials are simpler, slower, and

without the distractions of real life. The task types are also different from real life interactions where tasks need to be anticipated from the context, requiring specialized knowledge of context, culture, and variety of English, rather than just listening for a specific answer. Also, real life academic tasks most frequently involve bi-directional listening (where the student is both listener and speaker) (Vandergrift, 2007). This is in contrast to textbook approaches and most online listening materials which often test memory, reading, and writing skills rather than authentic listening.

Despite calls for the creation of authentic listening materials (Lynch, 2011), relatively little has been done, largely due to the fact that programs that arrange lectures by academic staff have difficulty meeting the needs of the various disciplines since language is embedded in disciplinary discourse (Becher & Trowler, 2001). Furthermore, little advice is given on how to teach or learn the important top-down or bottom-up skills highlighted in the literature.

Our initial aim, based on the literature review summarized above, was to address this teaching and learning gap by providing online listening materials for post-enrollment EAL graduate students which they could access and create themselves and would be more reflective of authentic listening environments. The next section of the paper describes the specific paper and web-based listening activities designed by the two lecturers/primary researchers based on the areas of need identified and confirmed by the participants/co-researchers in 2011, the literature/ theory related to these initial interventions, a brief evaluation of the initial results, and further expansion and refinement of each intervention.

## Implementation, Evaluation, and Refinement of Initial Intervention Strategy

***Listening for details.*** The literature highlights that the bottom-up listening skills that EAL students find particularly challenging are recognizing sounds as distinct words or groups of words (Goh, 2000; Vandergrift, 2007) and identifying specific facts within a stream of speech. These problems at the perception stage are often a result of difficulties in focusing of attention. In EAP classrooms and textbooks, this skill is often described as Listening for Details. However, as noted earlier, EAP materials are usually simplified and do not reproduce the speed of delivery and the need for real time response of authentic listening contexts. To address these issues, we trialed an example of a Listening for Details activity in two listening workshops in 2012 for graduate students using a video from an authentic Australian television program freely available on the public broadcaster (ABC) website. These workshops were part of our standard provision for EAL graduate students focusing on a range of research communication issues, and therefore only one workshop (repeated twice at different times in the semester) was dedicated to this topic. Students were expected to listen and complete a text with missing words.

We spent the last fifteen minutes of each of the two-hour workshops asking the students to provide group feedback (on butcher's paper) regarding their perception of the different materials provided. The Listening for Details intervention was positively received by the 33 participants attending the two workshops as they noted that it helped them to focus in on details. However, they indicated that a single exercise on a website would not provide sufficient and targeted practice and that they required material that was relevant to their specific disciplines and areas of interest. Hence, with the aid of a web developer, we developed a publically assessable central website (Everyday Listening Material, http://everydayenglish.org.au/). The front page of the website is provided in Figure 1 below.

Within this website, we placed the example exercise. Students are expected to listen and complete a text with randomly generated missing words (Figures 2 and 3). Thereafter, they are encouraged to create their own listening portfolio with audio and audio-visual material where the script is available from authentic materials in the public domain. They name the exercise, upload the audio, and paste the script into the "content" box, and then the program randomly generates missing words (Figures 2 to 4). This scaffolded process practices targeted attention while listening to authentic Australian media presentations and then provides software for students to generate their own listening portfolio and practice the skills they have developed. Therefore, they are able to develop their own "just for me" (Peters, 2007, p.1) (and my discipline) materials.

Although the materials are self-access, the activities involve explicit pedagogy since, as argued by Brown and Krager (1985, p. 406), the "'thrusting' of autonomy upon students without appropriate scaffolding and explicit instruction can lead to 'setbacks and perhaps greater dependence." Therefore, the activities carefully unpack the various listening contexts and skills. In the first stage, the contents and skills are explained using example audio material and activities. Then, students can either upload their own materials and generate their own listening exercises or apply a template to their own material. This process aims to develop what Brown and Krager describe as "competent autonomy" (1985, p. 406). These materials were developed based on the literature highlighted above and the contexts described by the research student participants in the focus group discussion and program evaluation.

Figure 1
*Everyday Listening Materials Webpage*

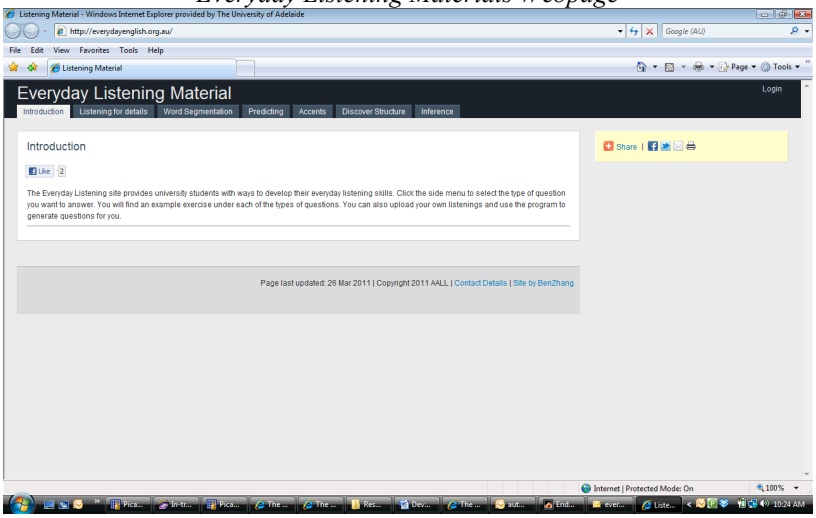
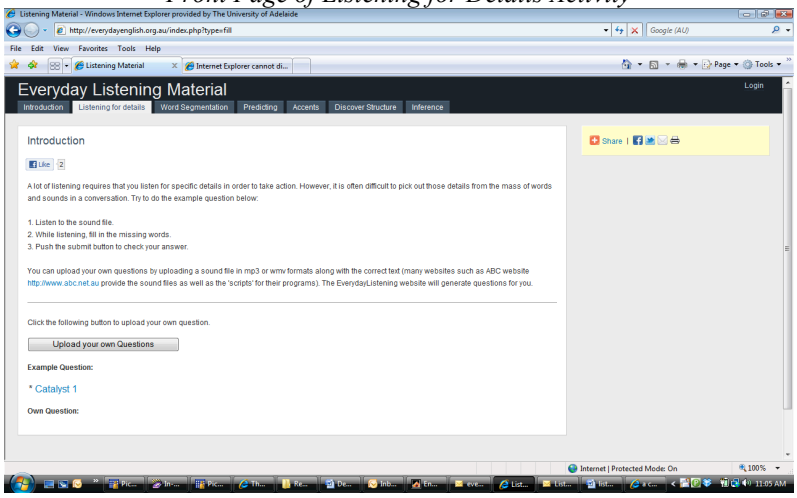



Figure 2
*Front Page of Listening for Details Activity*




***Word segmentation.*** Another perceptual issue related to listening for details is that EAL listeners often have difficulty in segmenting phonemes and parsing the stream of speech into meaningful sounds, words and phrases (Goh, 2000; Vandergrift, 2007). This is particularly challenging in Australian English where the division of the sound stream is unfamiliar to students accustomed to predominantly North American or British materials. This is also an issue for EAL students integrating into areas in North America or Great Britain with strong regional accents. To address this issue, we once again provided a paper-based exercise where we removed the spaces between words on a script of an audio text from the public broadcaster. The graduate student participants (n33) were required to add a single vertical dash between words and a double vertical dash at the end of each sentence. The paper version was favorably received by the participants of the listening workshop/ focus group (described above), and this exercise was added to our online listening website (See Figure 5). However, they noted that doing the exercise on paper slowed down the process of word segmentation.

The materials once again scaffold the skill by providing an example question using freely available media. The example question consists of a sound file and a continuous stream of letters without breaks for words or sentences (front page of activity as shown in Figure 6). The task is to distinguish between words and sentences. The students need to put one carriage return

Figure 3

*Example Question and Audio Player*

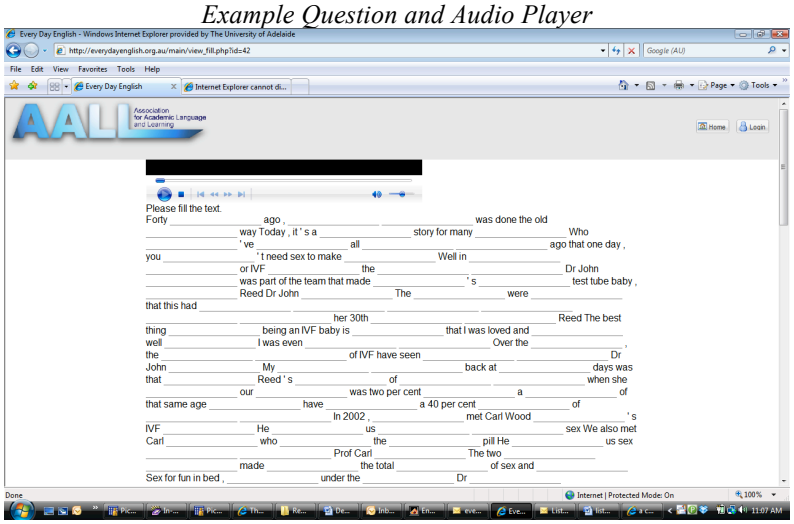
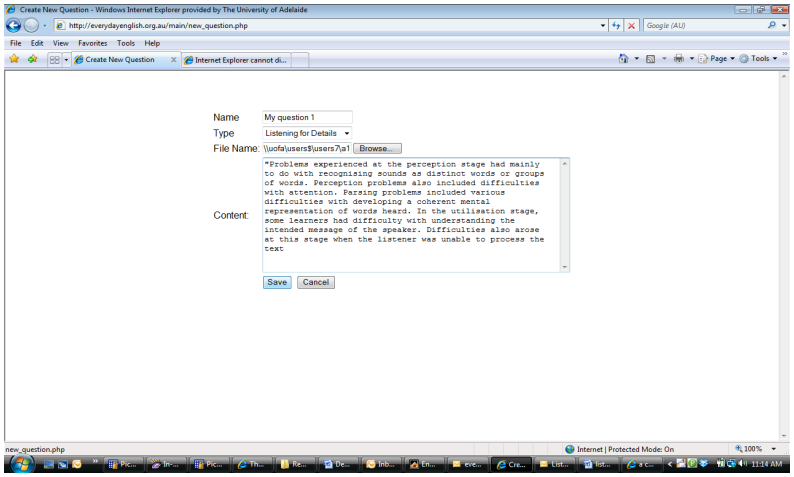



Figure 4

*Students Generate Their Own Material*




between each word and two carriage returns at the end of each sentence. The software then marks the answers for them. They are also able to create their own question from any audio-visual that has a script as in the exercise above. Here, the software removes all spaces between words and sentences after the students have uploaded their own questions. This process is then repeated as depicted in the example (Figure 6).

Initial evaluation and critique after a five-week trial of this activity from participants (n=20) contacted online who completed the activity was that they preferred the paper-based exercise since they found that the web exercise became a reading rather than listening activity. On further questioning it was discovered that in the paper-based activity the involvement of the lecturer had forced the participants to segment during the listening, while in the web-based activity they were segmenting after completing the task and thus the focus turned to reading. To address this issue, we added the following instruction on the word segmentation front page: "The example question is extremely fast, but try to press the space bar while you are listening and it will help to train your ear to distinguish words really quickly. Try the activity several times to see if you can increase your correct answers". Responses from the three participants who retried the activity were positive. Further software refinements that force participants to immediately complete the activity were then sought.

***Decoding accents.*** As mentioned above, Australian accents can be challenging for EAL students. This is because they are unfamiliar with the intonation, chunking, and pronunciation of Australian spoken

Figure 5

*Front Page of Word Segmentation Activity*

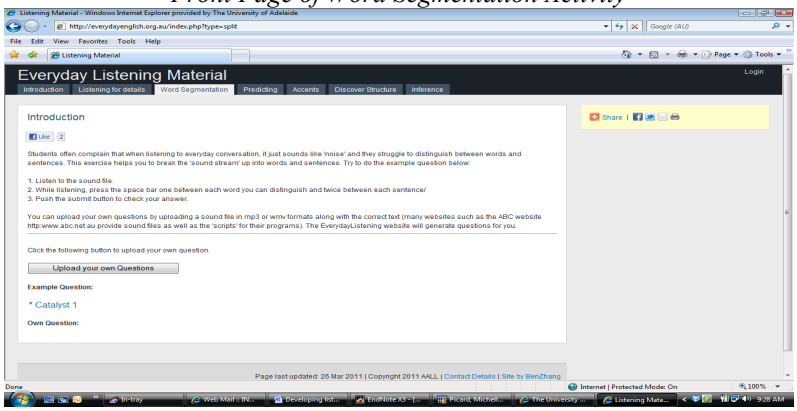
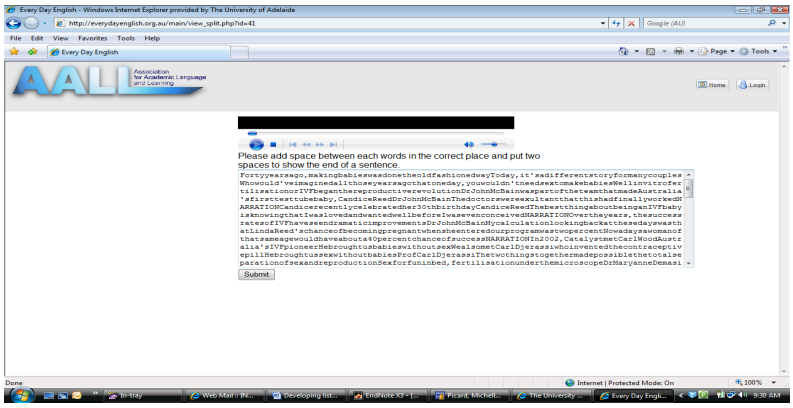



Figure 6

*Exercise Produces Text as a Continuous Sound Stream*




communication. When listeners are unfamiliar with a variety of a language, they also have difficulty differentiating between content and sentence fillers (Vandergrift, 2007). We therefore initiated several activities addressing phonetic knowledge and the ability to listen to and chunk unfamiliar pronunciation in everyday authentic interactions. The graduate student participants were introduced to the Australian vowel and consonant chart in the workshop and provided with examples of authentic Australian interactions in the various regional accents. They then listened to a sound file from youth Australian media with strong Australian accents and had to remember as many of the facts as possible to answer comprehension questions. However, as in real life communication, they were only provided with the questions after listening to the text and were expected to respond immediately. The comprehension exercise was then marked, and this served as a diagnostic exercise. When reflecting on this exercise in the last 15 minutes of the class, the participants at the listening workshops/focus groups reported that it replicated authentic listening contexts where no advice or focus was given, and they found it difficult to chunk aural text and identify meaning.

At this stage, the participants were given the template for targeted listening (see Table 2 below). They were provided with a second challenging listening and were requested to focus their listening according to the template. A considerable improvement of 3-5 marks out of 20 was shown by the vast majority of the participants (n=30 out of 33). We therefore added the Australian vowel and consonant chart to the website along with links to websites with visual and aural information on Australian sounds. An example of listening comprehension is provided, and after students complete the exercise, the software marks the students' answers. They are then given advice on uploading their own materials from the public broadcaster youth radio station and provided with the template for listening and responding (Table 2). This same template, with the addition of a response question (Question 7, Table 2), can be applied in real-time interactions.

Table 2
*Template for Targeted Listening*

| Question | Relation to Aural Text |
|---|---|
| 1. Who is speaking, and who is spoken about? | Why are they important to the speaker and listener? |
| 2. What is the major topic? | What response is expected from the listener to the topic? |
| 3. What numbers and key details are highlighted? | How do these relate to the major topic? |
| 4. Why are particular locations spoken about? | What relevance do these locations have to the speaker or listener? |
| 5. How does the supporting information add to the major topic? | What response is expected from the listener to this supporting information? |
| 6. What information is repeated? | Why is this information emphasized? |
| 7. When is the listener expected to respond? | What verbal cues are given that a response is required? |

Participants were advised to use the template consciously at least five times in practice exercises. The aim was that through constant practice with challenging authentic materials as well as an understanding of the sounds and intonation patterns, the students would become familiar with Australian accents and learn to distinguish between important and filler information. The participants who responded after the five-week trial (n20) indicated unanimously that this was a useful activity. They also reported varying levels of participation from using the template twice to fifteen times. Therefore, suggesting once again, the need for students to select what is "just enough" (Peters, 2007, p. 1) for their learning needs.

***Prediction and structure of discourse.*** Bottom-up skills such as dividing the sound stream into meaningful units, identifying word boundaries, understanding details, and differentiating between content and sentence fillers are all important skills. However, according to the literature, students often miss vital information when they stop to think about unfamiliar words or the interpretation of part of a text (Goh, 2000). Research on item difficulty in listening tests has indicated that speech rate and length of text, especially the use of unnecessary information, have a negative impact on lower level students' listening scores. Rather than enhancing listening, repetition can actually reduce performance (Brindley & Slatyer, 2002; Cervantes & Gainer, 1992; Chiang & Dunkel, 1992). This data in the literature was also reflected by the graduate student participants in the initial focus groups in 2011 (n120) who noted that they often felt embarrassed when speakers repeated something many times or spoke more loudly, yet their understanding did not increase. However, when they were prepared for an interaction and could predict the possible content, they could follow the listening text more easily.

Based on the identified needs of the students and the literature, we therefore aimed to enhance the speed and accuracy of their processing abilities by using top-down skills such as prediction and structural analysis in combination with bottom-up skills. We introduced students in the workshops (n=33) to a paper-based exercise where they were provided with a lecture from the public broadcaster. The lecture format was selected because this was a genre that the participants were familiar with. The response from the graduate student participants was that although the example lecture was a challenging one, because they were familiar with this genre, they were able to focus on the important information, leave out the filler information and predict the content to come using the discourse structure as a guide. However, several of the participants noted in their seminars groups five weeks later (n=10) and via email (n=20) that they were concerned that more informal interactions with their research supervisors or the public would not conform to this structure.

In response to this feedback, we therefore provide the students with three different types of audio-visual material on our website: lectures, public interactions (an extract from a television current affairs program), and one-on-one interactions between a student and a research supervisor. In the first exercise, as in the paper-based exercise, the students are provided with a lecture from the public broadcaster. They are given a few clues about the context of the lecture and then listen to the introduction of the speaker by the Master of Ceremonies. From this, they are required to predict the possible topic, the macro-organization of the lecture (e.g. cause and effect, chronology etc), discourse moves, and take-home message, and they set up their own template for taking notes. This is a guided process where they make choices and a template based on those choices is generated. Thereafter, they listen to the remainder of the lecture and take notes using the previously generated template and then answer comprehension questions. They are finally provided with answers to the comprehension questions and an example set of notes. After this scaffolded activity, the students are encouraged to download their own examples of lectures from the public domain and apply the given template to these materials. They are also

encouraged to listen to recordings of their own course lectures and apply the template to these presentations. This is also the case in the second exercise; however, the aural text and template in this case are less structured and formal than the public lecture in the first exercise since there are interruptions by reporters on the panel discussion. They are encouraged to apply this template to similar media interactions.

In the third exercise the students listen to a research supervision meeting between a student and her supervisor. They are provided with a template for taking notes in a research supervision meeting (Figure 7 below) and take notes while they are listening to the interaction. They then check their notes with the example notes taken and are encouraged to record their own supervision meetings (with permission of all participants concerned) and apply the note-taking template to these meetings. A template for meetings with an undergraduate or coursework lecturer is also provided.

In all three of these activities, the aim is to enable students to focus on the essential information scattered throughout a listening text or interaction and ignore redundancies by attaching information to existing schemata or note/discussion structures (Lynch, 2011). Three respondents completed the updated activities and reported that they found them useful in email communication.

***Understanding inferences.*** Despite having an understanding of the literal meaning of the words, Goh (2000) demonstrated that students are often unable to comprehend the complete meaning of the message. This utilization problem "relates to the listeners' (in)ability to make useful elaborating inferences, or act on the intended meaning of the message" (Goh, 2000, p. 56). The predicting activities described above potentially assist students in understanding inferences since they are aware of the context, topic, and discourse frameworks within which inferences are created. In our two workshops, we provided the graduate students with advice on how each type of interaction requires a different type of preparation from the listener as indicated in Table 3 below. However, there are still likely to be breakdowns in communication in real-time, dynamic interactions.

Most of the listening literature focuses on what the speaker or lecturer can do to facilitate better understanding. However, we argue along with Lynch (2011) that it is more useful to empower the listeners to take control of the interaction and facilitate their own listening. For this to occur, they need to hone their metacognitive listening skills (Vandergrift, 2004; 2007). Fifty percent of the graduate student participants (n60 out of n120) reported in the initial focus groups that they often felt disempowered when interacting in authentic contexts, especially when there was a power differential (such as in the research supervision context). Therefore, in the workshops we taught the students interactive listening skills such as "think aloud strategies" (Vandergrift, 2007) and concept checking with the interlocutor, along with skills to change the nature of the interaction. Discussions and reflection on real contexts that the students had encountered were undertaken in this part of the workshop. However, the challenge was to provide web activities to replicate this process.

In our final set of activities on the website, we therefore take the students through Van der Grift's (2004) stages of listening instruction and related metacognitive strategies and apply these to the same lecture in the public domain and panel discussion used in the predicting activity. These stages and strategies are presented, along with the specific activities in the exercise in Table 4 below. We have changed the heading "Stage of listening instruction" in Van der Grift's model to "Stage of listening activity" to reflect the fact that the student is taking control of his/her listening skills. After completing the exercise, the students are encouraged to apply these stages and strategies to their everyday listening. These activities received a positive response from the 20 participants who responded to our follow up email.

**Cycle 2: Enhancement of Online Materials**

After evaluating and refining the content of the online materials developed in the first action research cycle, we moved to a second cycle which focused on refining the materials and website based on the challenges and strengths of the online environment. We introduced the already created online listening materials to two new groups of research students in listening lectures/ workshops in the second half of 2012; these totalled 42 participants (Semester 2 and Summer School cohorts). This was an important step since the literature reveals that, although the online environment is seen as an alternative to face to face instruction, pedagogy and instructional design that meets the needs of adult learners for scaffolding and explicit instruction along with the development of "competent autonomy" (Brown & Krager, 1985) is often neglected (Hodson, Connolly, & Saunders, 2001).

As in the literature, our EAL research student participants were generally positive about using the online environment to develop their listening skills; however, they experienced challenges related to information literacy and task design within the online environment similar to those reported by Hughes (2012). For example, although the participants found it easy to complete the listening for details gap-fill activity, since it was similar to other simple online activities they had previously completed, some (n=6) in the follow up workshops/ focus groups reported

Figure 7
*Template for Note-Taking in Supervision Meetings*

| Topic/ Issue | Details |
|---|---|
| Completed tasks | |
| Current tasks | |
| Concerns/ Questions/Problems | |
| Things I would like you to do | |
| Ideas | |
| Other issues | |
| Current deadlines | |

Note. Adapted from Bastian, 2006.

Table 3
*Preparation for Understanding Inferences in Listening Texts*

| Context | Preparation required |
|---|---|
| In lectures | Pre-read lecture course handbooks, materials, listen to lecture outlines at the beginning of the presentation. Listen for discourse markers or language features indicating rhetorical 'moves'. |
| In supervisory and other meetings | Prepare/pre-read agenda, pre-read documentation and prepare your response, anticipate reactions and questions. |
| In daily life | Read the situation, emotions (watch body language and expression, contextual and situational clues, watch lips of speakers |
| The media | Read supporting information, listen for expository information, repetition, and blurbs |

difficulties uploading their own materials and generating questions for themselves, which was a new activity. In response to this feedback, we refined the instructions for creating their own materials and made it possible to upload .wmv formats as well as the original .mp3 format since some of the available materials on the web were in this format. We also added the URLs of possible sources for content into the website as most of the participants (n=40) reported difficulty in finding appropriate material.

In the second activity, as reported above, we attempted to refine the word segmentation question to ensure the participants answered the question *while* listening rather than *after* listening. A timer was added to the exercise; however, this intervention was unsuccessful since all the participants who attempted the revised question (n=10) found that their response lagged slightly behind the listening and, therefore, they were frustrated as they were unable to complete the activity in time. The timer was therefore removed, and more explicit instructions were provided to the users.

The participants were asked about their use of the listening template for targeted listening in a follow-up focus group. Although most reported that the concept and activities in the class were useful (n=30) and those who had completed the online exercise on the website had found it useful (n=20), only a few participants (n=5) had created their own portfolios.

Of those who had not created portfolios, some responded that they had found the Microsoft Word template tricky to download (n=5), while others (n=10) had had difficulty applying the template in everyday contexts. We therefore changed the activity to a more user friendly format using Articulate Engage'09 software and added a .pdf format template for those who preferred a hard copy printout. We also added additional examples to further scaffold the activity for the students and provide extra practice. We provided more advice on how to embed the use of the template in everyday activities with scenarios and suggested uses of the template.

Table 4
*Listening Stages, Strategies and Application*

| Stage of Listening Activity | Related Metacognitive Strategies | Application on Website |
|---|---|---|
| Planning and Predicting Stage | | |
| Prediction of topic, text type, structure of information, types of information and possible words | Planning and directed attention | • Students read blurb for "Global Moment" listening<br>• Students listen to Master of Ceremonies blurb and answer prediction questions:<br>• Topic: Something about Universities and Globalisation of Universities/knowledge<br>• Text type: Chronology<br>• Structure of information: Starting with earliest universities and knowledge exchange till today<br>• Types of information: Identification of characteristics of 'republic of learning' and examples of different aspects<br>• Students construct a note-taking template |
| First Verification Stage | | |
| Verification of initial hypothesis, correction if required, additional information noted | Monitoring | • Students listen to first few minutes of lecture<br>• Students monitor initial information<br>• Opportunity to add to template in the exercise |
| Comparison and/or concept checking with peers and/or interlocutor | Monitoring, planning and selective attention | • Check exercise to see if appropriate note-taking template was selected<br>• Note errors and add or delete information in template<br>• In real life, use concept checking e.g. "I understand x or y.... is this correct?". |
| Second Verification Stage | | |
| | Monitoring and problem solving | • Based on information received in previous section, students continue to listen to the rest of the listening exercise and add to their notes.<br>• They respond to comprehension questions in the exercise<br>• In real life, they respond to situation, questions from the interlocutor based on their notes, verified information |
| Response from peers and/or interlocutor to listener's response | Monitoring and evaluation | • Students check their answers in the listening comprehension exercise<br>• In real life, they verify the appropriateness of their response from the interlocutor's response<br>• Students evaluate their response by adding to their initial response or by further concept checking (e.g. "Oh, I understood x, do you mean y?") |
| Final verification stage | | |
| Targeted listening for gaps information gaps | Selective attention and monitoring | • In exercise, students listen to final summary of the lecture<br>• In real life students listen carefully to response from interlocutor |
| Reflection Stage | | |
| Development of goals for next listening activity | Evaluation | • In exercise, students reflect on skills they developed in the listening and their own weaknesses and strategies to overcome these.<br>• They are then given examples of real life strategies to take control of the listening environment (e.g. concept checking, changing the nature of the interaction e.g. asking for the interlocutor to speak slower rather than louder). |

Note. Adapted from Van der Grift, 2004, p.11.

As reported in the first action research cycle, we added aural texts from a current affairs program and a research supervision meeting. We provided predicting activities and templates for these. However, as with the targeted listening activity above, very few participants (n=6) reported practicing the predicting activity with lectures. A majority of the participants (n=27) reported that they had attempted to use the template in their supervision meetings; however, some of them (n=3) stated that their supervisors did not want them to record the interactions. We therefore decided to add additional examples of meetings in order to ensure practice online to scaffold the real, unsupported listening experiences. One of the participants had recorded the meeting without first consulting his supervisor and this had caused tension in their relationship. We therefore added information on the website to remind the participants always to request permission before recording.

The focus group responses from the second focus group also showed that the participants wanted more practice and explicit advice on how to apply metacognitive strategies to real-life situations. This was particularly the case with the small group of students who had used the website (n=4) but not attended the workshops/focus groups and had therefore not participated in the discussions on the use of metacognitive strategies in everyday situations. Consequently, we decided to add short questions and model responses for a series of everyday situations to guide online users of the materials. All changes were completed by the end of March 2013.

In general, positive feedback was received on those activities that the participants viewed as explicit, as good at providing sufficient practice, and as simple as possible in terms of instructional design.

## Conclusion

Our review of the literature has indicated that the focus of listening research needs to shift from the test environment to real-time, two-way communication and bi-directional listening (Lynch, 2011; Vandergrift, 2007) and that listening involves a joint creation of meaning between listener(s) and interlocutor(s). Although authentic materials are valued in the literature, little advice has hitherto been provided for students and teachers to create and use these resources. Another challenge of authentic listening contexts is that the listeners have to integrate top-down and bottom-up skills simultaneously.

The materials on the Everyday Listening Material website are a first attempt to facilitate the development of authentic listening skills and to assist students to create their own listening portfolios relevant to their disciplinary contexts. This material also has the potential to assist academic developers who might find it difficult to teach listening due to its "ephemeral" nature (Vandergrift, 2007, p. 191).

Our feedback from the participants in the final focus groups/workshops (n=40 out of 42) indicates that they valued the explicit teaching of bottom-up and top-down listening skills and their scaffolded application within naturalistic contexts (Brown & Krager, 1985), but particular refinements are needed to explicitly scaffold "competent autonomy" within the online environment. Since adult learners tend to wish to apply their life experiences to their new learning environments and favour practical learning activities that draw on their prior skills and are relevant to their needs and interests (Wynne, 2012), explicit instructions and careful linking of the activities to their experience are necessary to engage the learners and ensure their application of the skills. Further attention to the social and psychological issues affecting listening proficiency is also still required, since as one participant noted, "But how do these activities help me when I get anxious?" As we remind the students on the website, "Anxiety closes ears"; therefore, they should focus on "what [they] get rather than on what [they] miss" and "cultivate an attitude of attentiveness" (http://everydayenglish.org.au/). However, further materials are needed to address these issues. The next action research cycle will involve a large-scale evaluation of the materials for a new cohort (postgraduate coursework students) along with an evaluation of the effect of the materials on students' listening proficiency in the short and long term. We will also evaluate the materials with students who have not attended the accompanying workshops.

Although the online materials were specifically for EAL learners and academic language and learning practitioners, the action research cycle has revealed some universal considerations for online learning design. Firstly, it is no longer useful to produce inflexible generic activities, particularly for graduate research students. Instead, online design needs to enable students to develop their own materials that are "just in time, just enough, and just for me [and my discipline]." Explicit instructions and careful linking of the activities to their experience are also necessary to engage the learners and ensure their application of skills. Careful scaffolding is a useful emphasis in all higher education teaching and learning contexts, but particularly in the online environment since we cannot assume that all our students are entirely competent in all online environments.

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# Changing Perceptions of the University as a Community of Learning: The Case of Penn State

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Writing in 1990 for the Carnegie Foundation and the American Council on Education, Ernest Boyer described the importance of strengthening the colleges and universities as vital communities of learning by emphasizing six critical dimensions or characteristics of campus life: educationally purposeful, open, just, disciplined, caring, and celebrative. Boyer's work was widely discussed and provided a framework for change as administrators across the country sought to meet the new and emerging challenges of their institutions. How successful have these efforts been? To what extent do instructors and students see their campuses as exemplifying these principles? Is there evidence of changes across time in their views? Survey data collected in 1995-97 and 2011-12 from instructors and students at Penn State University's main campus and its satellite campuses found a sizable increase over time for both groups in the proportion who viewed their campuses as having the attributes of a Community of Learning.

Historically, access to higher education was largely limited to the training of privileged young males, with the academy serving *en loco parentis* during their period of schooling. Across the years, as the desire for, and access to, higher education became more widespread in American society, colleges and universities grew in number, size, and complexity. Student enrollments expanded and became more diversified, curricula became more varied and specialized, and technological/societal change underscored the need for these institutions to lead in developing new knowledge through research and discovery.

By 1990, the old rules of governance within colleges and universities appeared outmoded and unworkable, and educators sought new ways to organize campus life and culture. It was in the context of these debates that the work of Ernest Boyer, then President of the Carnegie Foundation for the Advancement of Teaching, called for the development of Campus Communities of Learning where shared norms and values fostered the pursuit of knowledge, personal growth, social responsibility, and respect for others (Boyer, 1990a). Six principles were defined by Boyer as the cornerstones of a Community of Learning:

- It is an *educationally purposeful* community where members work together to strengthen teaching and learning.
- It is an *open* community where freedom of expression is protected and affirmed.
- It is a *just* community where the sacredness of the person is honored and diversity is pursued.
- It is a *disciplined* community where individuals accept their responsibilities to the group and well-defined governance procedures guide behavior for the common good.
- It is a *caring* community where the well-being of each member is supported and where service to others is encouraged.
- It is a *celebrative* community where heritage and rituals that affirm both tradition and change are shared.

Boyer's call to arms resonated with educators across the nation, and it found expression in the development of a variety of activities and programs designed to strengthen individual campus communities (McDonald, et al., 2002). However, the pressures that precipitated Boyer's work more than two decades ago continue to challenge colleges and universities today and may indeed have become exacerbated. There are concerns that higher education institutions have lost touch with the essential characteristics that distinguish the academy from other less inclusive environments. Academic programs have been seen as drifting away from broad intellectual expansion and scholarship and toward incredibly focused student placements and the filling of employment opportunities (Boyer, 1990a; Boyer, 1990b; McDonald et al., 2002). Intellectual development and active citizenship are seen as being sacrificed by emphasizing narrowly defined skill sets rather than developing student potentials for both personal and societal contributions. Students have gradually been encouraged to be less focused on their role in the great society, but instead on their own professional and economic advancement.

Similarly, the focus of the professoriate has been viewed as evolving away from in-depth scholarship and student-focused teaching to the procurement of large scale research funding and journal article production (publish or perish). As a result, it may be that the presence and purpose of "community" on modern college campuses, if it ever existed, has declined to the point where it is unrecognizable. Some institutions and

faculty answered Boyer's call to action. Included were efforts to return our attention to our academic roots, to reward excellence in teaching and innovation, to make active efforts to imbed application into teaching, and to provide institutional funding for centers and specialized programs designed to link scholarship with an active community of learning. Such was the call to action at Penn State where such actions took place and continue.

## The Academy as a Community

### Community

Relevant to understanding the academy as a community of learning is the concept of "community" itself. Both scholars and the public use the term loosely to define places, patterns of social interaction, cultural norms, and social values (Brennan, Bridger, & Alter, 2013; Bridger, Brennan, & Luloff, 2009; Bridger & Luloff 1999; Bridger, Luloff, & Krannich 2003; Wilkinson 1991). Thus, the term refers to an ecological location. Boyer refers to a "campus" as a community**,** underscoring the idea that the community entails geographic space—a physical setting of brick and mortar buildings, classrooms, and traditional landscapes. But, it is also clear that the physical entity does not completely define what he (or others) means by "community."

Community also implies the presence of people who share the locale and participate in a field of social interaction in which their collective actions are directed purposively to the creation and maintenance of the social system of which they are a part (Brennan et al., 2013; Bridger et al., 2009; Wilkinson 1991). From this perspective, "community" is not taken as a "given." Rather it is a dynamic entity that develops and is continually re-created through social interaction. On campus, as in all localities, there are groupings of people or special interest groups organized around specific interests and goals. In the college/university setting, examples of such groups include academic units, colleges, administrative structures, service providers, and, of course, students and teachers. For a campus community to emerge, there must be a general awareness of overarching common needs, interests, and goals among these divergent fields. This awareness is developed by creating linkages among groups that otherwise would not interact. As these relationships are strengthened, they simultaneously increase local capacity to address the many problems and issues of the larger community field that inevitably cut across special interest groups.

From these interactions, a culture of shared histories, traditions, behavior patterns, and norms that embody the desired and desirable aspects of community life emerge. While culture also can, and does, change in response to the dynamics of social interaction, it provides a more or less stable set of values and beliefs which shape current social interaction within the community. To Boyer, campus communities should personify a culture that is educationally purposeful, open, just, disciplined, caring, and celebrative. Thus, "community" involves not only a representation of what "is" but also a social value whose worth goes beyond the possible contributions made in meeting the instrumental goals of the social unit. "Community" refers to the social bonds among members associated with cohesion, unity, reciprocity, and attachment. These linkages enable people to commit themselves to each other and to knit the social fabric that encourages engagement and group action. Such cohesion is also viewed positively from the perspective of the individual actor for whom attachment and belongingness are seen as contributing to psychological or personal well-being (Brennan et al., 2013; Wilkinson, 1991).

The concept of community as described by the above scholars, but also by Boyer, contributes to the attainment of educational missions. Our colleges and universities are not just an aggregate of individuals pursuing individual goals in isolation. While many students may be fiercely goal-oriented, they still exist and learn in an environment of students and scholars who learn from each other. Through collective exploration, critical analysis of topics, and an interactive learning environment, learning is a group dynamic. These conditions, along with common identities, rituals, and traditions, create a community that is far greater than the sum of its parts.

Boyer's call for developing campus Communities of Learning embodies all of these components of "community" with the vision that, by doing so not only will colleges and universities best fulfill their educational missions, but also "perhaps it is not too much to hope that as colleges and universities affirm a new vision of community on campus, they may also promote the common good in the neighborhood, the nation, and the world." (Boyer, 1990a, p. 67).

### Loss of Community

The issues that gave rise to Boyer's urgings for the development of new communities of learning were predicated on his observation that social patterns of behavior and culture which had bound campus participants together in an earlier era in which colleges were smaller, more intimate, and more homogenous, were lost with changing circumstances. Other observers have also bemoaned the loss of community in campus life (Cheng, 2004). Moreover, it has been suggested that the loss of community is endemic to society overall. Through the years, scholars have pointed to presumed weakening of community bonds as small

local settlements gave way to urban conglomerates. This hypothesized loss of community found early expression in the polar concepts of classical theorists including Toennies' shift from *Gemeinschaft- to-Gesselschaft* and Durkhiem's changes from mechanical to organic solidarity. The theme has been repeated through the years (Stein, 1960; Warren, 1978) with more recent statements by Robert Putnam (2000) in his much quoted book, *Bowling Alone* and Andrew Leigh's (2010) publication, *Disconnected*. Although some have criticized both the methodologies and conclusions of these latter writers (Durlauf 2002; McLean, Schultz, & Steger, 2002), popular conceptions often echo the theme that society today is increasingly less civically engaged, with fewer shared interactions, more divergent values, a lessening of community bonds, and a loss of social belongingness.

Boyer suggested means for reversing such presumed declines by engaging in purposive action directed to the strengthening of campus communities. In response, many institutions heeded his suggestions and initiated actions to stay or reverse the presumed loss of community.

## Purpose of the Study

The purpose of the present study was to assess the extent to which Boyer's principles defining a Community of Learning are manifest today and how (if at all) these have changed across time. Although Boyer based his assessments of the state of the academy on interviews with college and university administrators, the current study utilized the reports of students and teachers to assess the goodness of fit of the six principles to their campuses. As actors playing differing roles in their campus settings, it seemed possible that their perspectives might differ.

The analysis draws upon separate surveys of students and instructors carried out in 1995-97 and again in 2011-12 at both the "main" campus of The Pennsylvania State University (Penn State) located at University Park, PA., and at "satellite" campuses that comprise the University's Commonwealth Campuses. In all cases, respondents were asked to report how well each of Boyer's principles described the overall university and campus life at their institution. Data from these surveys were used to address the following research questions:

- What changes (if any) have occurred during the 15 years covered by the surveys in the perceptions of students and teachers at University Park and the Commonwealth Campuses in the degree to which they felt their campus was an *educationally purposeful, open, just, disciplined, caring and celebrative* Community of Learning?
- How do students and teachers in each of these two time periods differ from one another in their views of their campus as a Community of Learning?

## The Setting

Penn State is a large, multifaceted institution with historic roots in the Land Grant Act of 1863. The current study focused on two differing settings which are parts of the Penn State undergraduate instructional system: the "main" campus at University Park, and 19 separate locations which together form the Commonwealth Campuses.

The campus at University Park (UP) serves as the administrative and research hub of the University. It employs approximately 3,200 full-time faculty members and enrolls over 45,000 graduate and undergraduate students from throughout the world. Administratively, there are seventeen individual colleges located at University Park with hundreds of majors and thousands of course offerings.

A total of nineteen Commonwealth Campuses are scattered throughout Pennsylvania. While administratively and academically integrated parts of the Penn State system, these sites operate as somewhat separate units. Most offer a limited number of 4-year baccalaureate degrees and 2-year programs. However, many students take only their first two years of study at these locations, relocating to University Park or another Penn State campus to complete their degrees. These campuses vary in size from about 600 to more than 4,000 students in any given semester.

## Changes in Campus Life

During the years between the 1996-97 and 2011-12 surveys, numerous resources and programming initiatives were directed to developing Penn State as a Community of Learning that embodied the elements enunciated by Boyer. Thus, a 1995 Student Encampment brought Ernest Boyer to campus to describe the work of the Carnegie Foundation and to encourage the building of a civil community of learning. This was followed by a series of Conversations on Teaching and Learning sponsored by the Center for Excellence in Learning and Teaching and the USG Senate/Academic Assembly that engaged students, teachers, and administrators in defining mechanisms for accomplishing this goal (Enerson, 1996).

Elements of these principles were included in University statements of the mission, values, vision and goals in the faculty and staff newspaper; in formal presentations of the University's President and the Vice

President of Student Affairs; and in annual "State of the University" addresses by then President Graham Spanier (cited in Willits, Janota, Moore, & Enerson, 1996). The Office of Student Affairs took leadership in developing strategic planning efforts to strengthen the campus as a community of learning through academic alliances linking faculty, students, and staff; utilizing technology for sharing information; directing campus dialogues and other resources to focus on maintaining a just and caring environment; and building alliances with the larger community of which the campus is a part to encourage responsible citizenship (Moore & Carter, 2002). Many of these efforts continue today. If they have been at all successful, changes in the extent to which Penn State exemplifies the principles of a Community of Learning would be expected to have increased across the years. This study explores the veracity of that expectation.

## The Data

During fall semester 1995 a random sample of 492 undergraduate students at University Park was contacted and asked to participate in the survey; 362 agreed to do so (a 74% response rate) (Willits et al., 1996). Respondents were asked to indicate on a scale from 1 to 5 how well each of six statements drawn from Boyer's descriptions of a Community of Learning characterized the University Park Campus. A score of 1 meant the description did not fit at all; a score of 5 indicated it was a perfect fit. Codes 4 and 5 were combined for this analysis to mean the descriptions "fit" the campus community; codes 1, 2, and 3 were grouped as meaning the descriptions did not apply well to the campus. The specific items were as follows:

1) Penn State is an educationally purposeful community where faculty and students work together and share academic goals.
2) Penn State is an open community where freedom of expression is protected and civility is embraced.
3) Penn State is a just community where each person is honored and diversity is pursued.
4) Penn State is a disciplined community where obligations and behaviors are regulated for the good of the group.
5) Penn State is a caring community where service to others is encouraged and the well-being of each individual is important.
6) Penn State is a community whose history is remembered and whose traditions and rituals are celebrated.

Several months later, a mail survey of faculty members at University Park was carried out addressing these same issues. The same questions concerning the extent to which Boyer's descriptions of a Community of Learning accurately described the University Park campus were included. Questionnaires were sent via campus mail to a random sample of 1,072 of faculty who had taught during fall semester, 1995. Of these, 589 returned completed surveys – a 55% response rate.

In spring, 1997, mail surveys of both students and teachers at the 19 locations that now form the Commonwealth Campus were carried out (Willits, Seifried, & Higginson, 1998). A total of 993 students and 1028 teachers responded to these surveys. As with the University Park studies, respondents were asked to rate the "fit" of Boyer's six characteristics of a Community of Learning to their specific campus locations.

More than 15 years after these first surveys, during spring semester 2011, a total of 7,500 randomly selected undergraduate students at University Park were contacted by e-mail and invited to participate in an online survey containing many of the same questions that had been included in the earlier studies. Of those students contacted, 1,837 completed the survey – a 25% response rate. Also during spring semester 2011, a listing of all instructors who had taught one or more courses at University Park during the fall semester 2010 were invited to participate in a similar online survey. Of the 3,953 instructors contacted, 1,537 did so – a 39% response rate . Both of these surveys asked the same six questions of faculty and students concerning their perceptions of the extent to which Boyer's descriptions of a Campus Community of Learning "fit" the University Park campus (Willits et al., 2013a).

Using the same protocols, students and instructors at the nineteen Commonwealth Campus locations of Penn State were contacted and asked to complete an online survey with identical measures to that used at University Park Campus. A total of 1,566 students and 921 faculty members responded. The survey included identical questions concerning the extent to which respondents felt the attributes of a Community of Learning "fit" their particular campus (Willits et al., 2013b).

## Analysis

### The Campus at University Park (1995-2011)

Students surveyed in 2011 at University Park were significantly more likely than their counterparts in 1995 to report the campus "fit" the description of a Community of Learning (Table 1). For every one of the six criteria suggested by Boyer as important in defining such a community – *educationally purposeful*, *open*, *just*, *disciplined*, *caring* and *celebrative* – the percentage of students giving ratings of 4 or 5 on the goodness of fit rating scale in 2011 was greater than

Table 1
*Percentages of University Park Students and Faculty Who Felt the Characteristics of a Community of Learning "Fit" Their Campus in 1995 and 2011.*

| | 1995 | | 2011 | |
|---|---|---|---|---|
| | Students (n=362)* | Faculty (n=589) | Students (n=1837) | Faculty (n=1537) |
| Characteristic | % | | | |
| Educationally purposeful | 57 | 25 | 69 | 50 |
| Open | 53 | 40 | 78 | 66 |
| Just | 49 | 29 | 72 | 58 |
| Disciplined | 46 | 29 | 58 | 45 |
| Caring | 54 | 23 | 72 | 54 |
| Celebrative | 70 | 47 | 85 | 64 |

*Note*. *Numbers of cases varies due to nonresponse to some items.
**Percentage rating the "fit" as 4 or 5 on a 5-point scale.

had been the case in 1995. Moreover, these were not small shifts. In every case, the differences between comparable percentages in 1995 and 2011 were more than 10 percentage points, and in two cases the shift was more than 20 percentage points. Thus, the percentages of students in 1995 reporting that the campus was *open* in embracing civil expression of differing views increased from 53% to 78% between 1995 and 2011, and the percentages characterizing the campus as a *just* community where each person is honored and diversity is pursued rose from 49% to 72%. The percentage of students who perceived the campus as a *caring* community where individual well-being and service prevailed increased from 54% to 72%. Descriptions of the campus as *disciplined* with behavior and obligations regulated for the good of the group increased from 46% in 1995 to 58% in 2011. Somewhat lesser, but still significant shifts occurred for reporting the campus was *celebrative* of campus history and traditions, (70% to 85%) and *educationally purposeful* (57% to 69%).

The dramatic shifts in student perceptions of the University Park campus wane when compared to the changes in views of instructors there that occurred during the same period. Whereas at the time of the survey (in 1995) fewer than half of the faculty reported that any of the six characteristics of a Community of Learning "fit" the University Park situation, in 2011 these percentages had increased by 25-percentage points or more for four of the six items, with no increase of less than 15-percentages points for any item. Thus, while just 23% of the faculty surveyed in 1995 reported the description of a *caring* community "fit" the University Park campus, in 2011, that percentage had more than doubled to 54%. Similarly, the percentage reporting the campus was *educationally purposeful* and *jus*t doubled in the same time period (25% to 50% and 28% to 56%, respectively). Shifts in regard to *openness* (40% to 66%), *disciplined* (29% to 45%), and *celebrative* (47% to 64%) were also sizable.

In both time periods, students at the University Park campus were more likely than faculty at that location to see their campus as *educationally purposeful*, *open, just*, *disciplined*, *caring*, and *celebrative*. Despite shifts in views across time, most of the student faculty differences remained intact in 2011. Two exceptions are worthy of note in that they suggest some convergence in the views of the perceptions of these two groups: the difference between student and faculty perceptions of the campus as an *educational purposeful* community declined from 32 percentage points in 1995 to only 19 percentage points in 2011, and the difference in student and faculty acceptance of the campus as a *caring* community declined from 31 percentage points in 1995 to only 18 percentage points in 2011.

Also, for both students and faculty in 2011, the element least identified as characteristic of the University Park campus community was that of *disciplined*, suggesting that a sizable percentage of these groups failed to identify the campus as one where obligations and behaviors are regulated for the good of the group. Half of the instructors and about 30% of the students failed to identify the campus as *educationally purposeful* in 2011.

**The Commonwealth Campus (1997-2012)**

There were also significant shifts in the extent to which students enrolled in the Commonwealth Campuses reported their locations met the Community of Learning criteria (Table 2). As was true for the

Table 2
*Percentages of Commonwealth Campus Students and Faculty Who Felt the Characteristics of a Community of Learning "Fit" Their Campus in 1996 and 2012.*

| | 1997 | | 2012 | |
|---|---|---|---|---|
| | Students (n=993)* | Faculty (n=1028) | Students (n=1566) | Faculty (n=921) |
| Characteristic | % | | % | |
| Educationally purposeful | 55 | 48 | 81 | 67 |
| Open | 58 | 64 | 82 | 77 |
| Just | 53 | 54 | 80 | 75 |
| Disciplined | 50 | 42 | 71 | 64 |
| Caring | 53 | 53 | 80 | 72 |
| Celebrative | 44 | 38 | 73 | 58 |

*Note*. *Numbers of cases varies due to nonresponse to some items.
**Percentage rating the "fit" as 4 or 5 on a 5-point scale.

University Park students, the percentages of Commonwealth Campus students indicating their campus location was *educationally purposeful*, *open*, *just*, *disciplined*, *caring,* and *celebrative* increased across the 15-plus years covered by the study. All of these shifts were statistically significant and sizable, reflecting more than a 20-percentage point increase. The greatest changes were in regard to the characteristics of *celebrative* (44% to 73%), *caring* (53% to 80%), *jus*t (53% to 80%) and *educationally purposeful* (55% to 81%).

There were similar but only slightly less dramatic increases between 1997 and 2012 in the percentages of faculty members at the Commonwealth Campus sites who reported their campus "fit" the characteristics of a Community of Learning. In every case, the percentage increased by at least thirteen percentage points over the study period, and in three instances (*disciplined, just,* and *celebrative*) the increase was 20-percentage points or more.

In 1997, there were relatively small and inconsistent Commonwealth Campus student-faculty differences in the percentages reporting the presence of each of the elements of a Community of Learning. However, in the 2012 survey, students were consistently more likely than instructors to view their campuses positively in terms of these elements, with largest student-faculty percentage differences in regard to the elements of *educationally purposeful* (81% vs. 67%) and *celebrative* (73% vs. 58%). In 2012, the attributes of celebrative and disciplined were the least likely to be identified by students and faculty alike as characteristic of their campus communalities.

**An Engaged Community**

The six characteristics initially defined by Boyer and included in the previous analysis described the *internal* characteristics of a Community of Learning. In many ways they suggest a campus as a special place remote from worldly or practical affairs where members strive for an integrated, supportive, and diverse environment in which they devote themselves to study, personal growth, and the advancement of knowledge. This "ivory tower" image has developed pejorative connotations in recent years. Writers have criticized universities for engaging in esoteric research, outmoded learning styles, and the teaching of "useless" information unrelated to day-to-day realities with little utility for the learner or for the larger society. This was clearly *not* Boyer's vision for the university or college community. In other writings, Boyer underscored the importance of involvement in what he termed the "scholarship of application"—or "engagement," as it is now called—in which scholarly understandings, principles, and analyses are brought to bear on issues and problems in the larger society (Boyer, 1990b). Such engagement represents a kind of "service," but not simply in the sense of "doing good". Rather:

> To be considered scholarship, service activities must be tied directly to one's special field of knowledge and relate to, and flow directly out of this professional activity. Such service is serious, demanding work, requiring the rigor –and the accountability – traditionally associated with research activities (Simpson, 2000, p. 9).

In the intervening years, support for the "engaged university" has exploded as educators, students, government officials, local leaders, and the public have sought the input of academic knowledge into public and private decision-making with an emphasis on "engagement and application" schooling, including service learning and internships, as a means of applying " text-book" materials to real-life situations (Kellogg Commission, 1999). This desire to have students engage in their local and global societies and apply the broad range of diverse knowledge that they have achieved through their academic career is significantly different from the narrowly defined focus on select majors and career placement.

By 2011, support for the idea that Communities of Learning should be "engaged communities" had become sufficiently widespread that the surveys of students at both University Park and the Commonwealth Campuses asked respondents to report the extent to which the following statement described their Penn State campus: "It is a community that is engaged in addressing issues in the larger society." Again, responses ranged from "1," meaning the description "does not fit at all," to" 5," meaning it was a perfect fit. As with the previous items, codes of "4" and "5" were combined to mean the campus was perceived as "engaged."

More than 7 of 10 students reported they felt their campus was an "engaged" community. Commonwealth Campus students were more likely (74%) than those from University Park (72%) to answer "4" or "5" on the scale. Instructors at the Commonwealth Campus (62%) were less likely than their students to report their campus was an "engaged" community. The question was not asked of University Park instructors.

Of course, these data present no information on *changes* in the perceived levels of community engagement across the 15 years included in the current study since comparative data from 1997 were not available. However, it is noteworthy that although the idea of 'engagement" was not even a part of Boyer's original formulation, many students reported that this term described their campuses today.

**Summary and Discussion**

Based on these data, one conclusion seems clear: over the decade and a half covered by the current analysis, there have been consistent, clear, and measurable increases in the extent to which Penn State was viewed by both students and teachers as a Community of Learning. This was true for every one of the six principles described by Ernest Boyer (1990a) as the defining criteria for such a community (*educationally purposeful*, *open*, *just*, *disciplined*, *caring* and *celebrative)* as reflected in the perceptions of students and faculty at both the University Park campus and the Commonwealth Campuses. Not only did the percentages of respondents reporting that these principles "fit" their campuses increase over the years, but these shifts were generally large. By the final surveys in 2011-12, for virtually every item a majority of both students and faculty at the University Park and Commonwealth Campus locations reported that the principles that exemplified a Community of Learning described their campus.

Of course, these data deal only with the *perceptions* of random samples of students and instructors in the University community; there was no attempt to arrive at objective indicators of these phenomena. However, we would argue that the *perception* of "community" among participants is both an important indicator and component of the *existence* of a community. Put otherwise, if things are believed to be real, they are real in their consequences (Merton, 1995; Thomas & Thomas, 1928).

Why has this remarkable shift occurred? It seems likely that much has been fostered by purposive action on the part of the University. Early on, the administration under then President Graham Spanier sought means for humanizing the University, and a wide range of programs were developed to enhance the academic and social climate of the campuses. Included were efforts to reward excellence in teaching and innovation, active efforts to imbed application into teaching, and institutional funding for efforts designed to link scholarship with an active community of learning. As a result, significant increases in student and faculty recognition of the university as a community of learning were achieved. This was particularly true among faculty members at the commonwealth campuses of Penn State. This, in part, can help explain the massive increase in University Park faculty responses to the items studied. In the past their scores were the lowest, and in the most recent survey were on par with the other comparison groups.

At the same time, public concerns over the loss of community in the larger society may have precipitated efforts that directly or indirectly impacted campus life. Whatever the cause(s), the results of this analysis support the conclusion that remarkable increases have occurred in student and faculty acceptance of the university as exemplifying Communities of Learning. Moreover, the relatively high percentages of students and instructors who in 2011 identified their campuses as "engaged" suggest this may also have increased as an important component in campus communities.

Several caveats should be noted, however, lest we celebrate these changes too eagerly. Although in the latest survey a majority of the students and, except for a single instance, at least 50% of the faculty did report their campus "fit" the description of each of Boyer's six

principles defining a Community of Learning, a sizable minority did not agree. Particularly troubling is the finding that half of the University Park and one third of the Commonwealth Campus faculty did *not* feel their campus was educationally purposeful. About three out of ten of the University Park and almost one in five of students in the Commonwealth Campus also failed to see their campus as educationally purposeful. Since it is this dimension that would seem to be fundamental to the primary teaching mission of the University, these figures seem disappointingly low, although the significant positive changes in these perceptions over the study period suggest that even these perceptions may become more favorable in the years ahead.

The extent to which the findings of this study can be generalized to other college or university settings is uncertain, but analysis of the Penn State case provides a glimpse into the possible relevance of Boyer's ideas today and to the changes that have occurred over the preceding 15 years. Additional research is needed to monitor changes in the extent to which these attributes are perceived as occurring in these and other campus communities now and in the future.

How relevant are Boyer's ideas concerning Communities of Learning as we look ahead, given the changing face of higher education? Dramatic changes in technology, changing enrollment patterns, and demographic shifts will significantly alter higher education in the future. Although Boyer could not envision the nature and extent of these changes, nevertheless his call for developing communities of learning which are educationally purposeful, open, just, disciplined, caring, celebrative, and engaged remains relevant. This study has highlighted the remarkable shift toward developing such a community that was brought about by planning and structurally reinforced efforts on the part of a university. The challenge for educators and administrators in the years ahead is to remain adaptive to creatively meeting the challenges of changing environments in higher education and to developing ways to foster the growth of learning communities that exemplify Boyer's principles of educationally purposeful, open, just, disciplined, caring and celebrative, and engaged.

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# Investigating Postsecondary Self-Regulated Learning Instructional Practices: The Development of the Self-Regulated Learning Observation Protocol

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Promoting students' self-regulated learning (SRL) is one way to improve postsecondary student success. However, few studies have investigated the instructional practices of postsecondary instructors that may support students' SRL. This study sought to fill this gap. An undergraduate mathematics course was observed to determine instruction utilized in classrooms that could influence students' SRL. Results showed that instructor references were made to four areas of SRL: (a) cognition; (b) motivation and affect; (c) behavior; and, (d) context. The majority of references concerned cognition and fewer messages addressed motivation. Findings are discussed in terms of postsecondary instructional practices that may foster students' SRL. This project is significant because it developed an observation protocol to assess instructional practices that may support college students' SRL in specific college courses: the Self-Regulated Learning Observation Protocol (SRLOP).

As postsecondary outcomes have increasingly become a national area of concern, a focus on instructional practices in higher education has also surfaced (Altbach, 2011). Failure rates in undergraduate mathematics core courses, in particular, have remained high (Gupta, Harris, Carrier, & Caron, 2006). For example, only 40 to 60% of students successfully pass college precalculus nationwide (Olson, Cooper, & Lougheed, 2011). The high attrition rates in college Science, Technology, Engineering, and Mathematics (STEM) courses have prompted politicians and educators alike to focus on refining STEM pedagogy (McCray, DeHaan, & Schuck, 2003; Olson et al., 2011).

One approach to increasing postsecondary success rates is by teaching students how to become more effective self-regulated learners. Self-regulated learning (SRL) is the proactive process through which students become masters of their own learning and performance (Pintrich, 2004). Self-regulated learners take initiative in their education and persevere, constantly adapting to their learning environments and tasks at hand (Zimmerman, 2002). Becoming a more persistent self-regulated learner could especially benefit students in historically challenging undergraduate STEM courses, such as mathematics. SRL is viewed as controllable and unstable (Pintrich, 2000, 2004); therefore, college students' SRL practices can be influenced by classroom instructional practices.

## Theoretical Framework

For this project, we adopted Pintrich's (2000; 2004) model of SRL which proposes a framework for classifying four areas of learning that students can regulate: (a) cognition; (b) motivation and affect; (c) behavior; and, (d) context. Although there are currently several other models of SRL that propose different constructs and mechanisms involved in the learning process (e.g., Boekaerts, 1996, 1999; Greene & Azevedo, 2007; Winne & Hadwin, 1998, 2008; Zimmerman, 2000), Pintrich's model was selected as a framework because it focuses on specific aspects of learning that students can be taught to control. In particular, Pintrich's SRL model includes context, a category exclusively dedicated to students' learning environment (i.e., one variable of particular interest in this study). Each of the four areas of SRL will be described in more detail below including strategies instructors can use to foster students' SRL for their courses.

### Cognition

The first area of learning that students can regulate concerns techniques that students use to process information or perform a learning task, such as metacognitive strategies (Pintrich, 2000). There are many types of cognitive strategies that have been taught to college students through various methods such as rehearsal, elaboration, and organization (Hofer, Yu, & Pintrich, 1998). Elaborative and organizational strategies, such as concept mapping, have been shown to result in deeper understanding of learned material (Hofer et al., 1998). It is well-established that cognitive regulation is essential to deep and meaningful learning (Winne & Hadwin, 1998). There are many ways that instructors can promote students' cognitive regulation. For example, teachers could encourage students to use specific strategies to learn or perform a task, prompt students to monitor their level of understanding or gauge students' understanding themselves, or prepare students to learn new information.

### Motivation and Affect

In addition, motivation and affective components play a key role in SRL (Pintrich, 1999, 2000; Zimmerman & Schunk, 2007). Students can regulate

their motivation and affect just as they are able to regulate and monitor their cognition (Pintrich, 2004; Wolters, 1998, 2003). Motivation plays an especially important role in SRL because learners will not use self-regulatory strategies if they are unmotivated to do so (Zimmerman, 2000). Moreover, measures of achievement motivation have been shown to predict college students' academic performance above other aspects of students' SRL and ability levels (Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004). Students' interests (see Hidi & Renninger, 2006) as well as expectancies and values (see Eccles, 2009) are critical components of their achievement motivation. To foster students' motivation in the classroom, college instructors could point out the usefulness of learning tasks so that students are motivated to engage with course material. Moreover, students who feel that their instructors are interesting are more likely to attend class (Gump, 2004); therefore, instructors could focus on sparking their students' situational interest by using humor.

**Behavior**

Behavioral aspects of SRL reflect the effort that students put into learning tasks, including help-seeking and time management (Pintrich, 2000). Students must engage in activities to purposely activate, foster, and sustain the learning process. Academic help-seeking, can be advantageous in improving students' understanding and achievement (Pintrich, 2000). Help-seeking behaviors include utilizing the various learning resources and supports on campus, such as learning centers and course review sessions. Time management behaviors, such as creating study schedules, help direct the learning process and are typically emphasized in SRL interventions (Hofer et al., 1998; Pintrich, 2000, 2004). Effective self-regulated learners actively engage in behaviors, such as help-seeking and time management, that help students reach their academic goals. Postsecondary instructors can encourage students to engage in these types of behaviors outside of the classroom or promote positive behavioral regulation during normal instruction. For example, an instructor could suggest that students visit the campus tutoring center to receive help on challenging assignments or scaffold students' use of time on in-class learning tasks.

**Context**

Finally, the contextual or environmental area of SRL involves external aspects specific to the learning task, such as classroom settings or rules of an assignment (Greene & Azevedo, 2007; Lodewyk, Winne, & Jamieson-Noel, 2009; Pintrich, 2000, 2004; Zimmerman, 1989). All learning occurs in a contextual setting; therefore, students must utilize specific strategies to monitor, alter, and control their learning environments. Although students may be unable to control their instructors' teaching styles or the content of their assignments, they can manage certain aspects of their learning environment (Pintrich, 2004). The area of context is not completely "self"-regulated because much of students' learning tasks and environments are external and beyond their control; however, context is considered an area of SRL because students do have some control over how their learning environments are structured. In addition, academic content, such as instructor feedback and assessment tasks, serves as an agent in students' SRL processes (Nicol & Macfarlane-Dick, 2006; Perry & Rahim, 2011). Instructional scaffolding of learning tasks can help students regulate their cognition, motivation and affect, and behavior.

**Postsecondary Self-Regulated Learning**

Because the majority of postsecondary learning takes place outside of the classroom (Hofer et al., 1998; Pintrich, 2004), college students must learn to effectively regulate their own learning processes in order to perform well in their courses. Although SRL skills are critical to postsecondary success (Hofer et al., 1998), many college students are not effective self-regulated learners (Bembenutty, 2008). Students often rely on the external support of their teachers through secondary schooling to direct their learning processes and find managing collegial coursework to be challenging (Boeakarts, 1999). Moreover, introductory undergraduate courses, such as mathematics, are often taught in large lecture halls (McCray et al., 2003; Olson et al., 2011) where instructors are unable to provide students with the individualized feedback and scaffolding that learners received through secondary education. In large lecture courses where instructors rarely are able to interact directly with their students, learners bear an even larger responsibility in monitoring and controlling how much they learn. As noted by Meyer and Turner (2002, p. 19), "co-regulation between a teacher and twenty-some students with varying needs and competencies is highly complex in whole-class instruction." If co-regulation is complex in a classroom of twenty-some students, imagine how complicated it can be in a large undergraduate lecture hall containing hundreds of students. Therefore, it is of particular importance that students be taught to effectively self-regulate their own learning in large courses in order to successfully master the complex material.

## Literature Review

### Postsecondary Self-Regulated Learning Instruction

**Student success courses.** Many formal instructional interventions, such as Student Success Courses, have been designed to help college students become better self-regulated learners (Wolters & Hoops, 2015. Student Success Courses (SSCs) teach students theory and strategies of SRL to help students achieve academic success. These courses have proven successful in increasing students' SRL behaviors (e.g., Forster, Swallow, Fodor, & Foulser, 1999; Hofer & Yu, 2003; Hoops, Yu, Burridge, & Wolters, 2015; Petrie & Helmcamp, 1998), grades (e.g., Bail, Zhang, & Tachiyama, 2008; Tuckman, 2003; Tuckman & Kennedy, 2011; Weinstein, 1994), retention (e.g., Forster et al., 1999; Lipsky & Ender, 1990; Tuckman & Kennedy, 2011), and graduation rates (e.g., Bail et al., 2008; Schnell, Louis, & Doetkott, 2003; Tuckman & Kennedy, 2011; Weinstein, Dierking, Husman, Roska, & Powdrill, 1998).

**Integrated approach to strategy instruction.** The SRL strategies taught in SSCs can also be integrated into traditional academic course curriculum (Hofer et al., 1998; Weinstein, Acee, & Jung, 2011); an integrated approach to SRL instruction can help students thrive in demanding college courses by providing learners with the tools to self-regulate their study habits for a particular course. Embedding strategy instruction into normal course curriculum increases the likelihood that students will apply the strategies they have learned to the material they are currently learning (Hofer et al., 1998). Additionally, the integrated approach to SRL instruction can be particularly helpful to less-proficient self-regulated learners (Barrie, 2007; Cornford, 2002; Weinstein, Tomberlin, Julie, & Kim, 2004). Therefore, investigating instructors' natural integrated approaches to SRL instruction could help researchers understand how and if current postsecondary classroom climates are conducive to fostering students' SRL behaviors.

### Observing Self-Regulated Learning Instructional Practices

Although self-reports are the primary tools used to measure SRL (Perry & Rahim, 2011), it has long been argued that self-report data alone are insufficient for understanding the complexities of SRL in real contexts such as classrooms (Perry & Rahim, 2011; Perry & Winne, 2006; Winne, Jamieson-Noel, & Muis, 2002; Winne & Perry, 2000). According to Meyer and Turner (2002), researchers must study the contexts in which students' SRL develops in order to better understand self-regulatory processes in general. Because SRL supports and is supported by social forms of learning, such as within a classroom (Perry & Rahim, 2011), qualitative methods are well-suited to explore the relationship between teaching and learning during instruction (Meyer & Turner, 2002). Additionally, because SRL is a multi-dimensional construct (Perry & Rahim, 2011; Winne, 2011), qualitative methods, such as classroom observation, are suitable ways to explore SRL within educational environments. Studies examining teachers' instructional practices that support students' SRL have mostly been conducted exclusively in K-12 classroom settings.

**Scaffolding elementary self-regulated learning in math class.** Meyer and Turner (2002) have utilized qualitative methods to investigate instructors' scaffolding of elementary students' self-regulation development. The researchers utilized discourse analysis to record and code classroom observation data of teacher-student interactions during whole-class math lessons. Teachers' scaffolding comments were coded under three categories: (a) student understanding; (b) autonomy; and (c) positive classroom climate. Non-scaffolded responses were coded as either teacher-controlled or nonsupportive motivational or socioemotional. Finally, code proportions were calculated for each classroom by lesson and total instruction time observed. Discourse patterns were compared to understand how instructors could scaffold students' self-regulation during normal classroom instruction.

**Promoting students' self-regulated learning through classroom structure.** Perry and colleagues have also made advancements in investigating contextual aspects that support SRL development in the classroom through qualitative methods. Much of Perry's work has sought to understand how classroom features promote or constrain children's SRL development and engagement in a variety of classroom environments (Perry & Rahim, 2011). Through observation and interviewing, her work has focused on teachers' speech and behaviors that promote SRL and how students respond to such promptings. During classroom observations, an instrument was used to collect three types of information: (a) classroom; (b) teacher and students' speech; and, (c) high or low SRL environment (Perry, 1998; Perry, Hutchinson, & Thaurberger, 2007; Perry & VandeKamp, 2000; Perry, VandeKamp, Mercer, & Norby, 2002). Collecting the second type of information, teacher and students' speech, involved recording a running record of what occurred in the classroom. This often included teacher and student verbatim responses (Perry, 1998). During observation, observers recorded the times that student-teacher and student-student events took place. Based on running record observations, classrooms were designated as either high or low SRL-supportive (Perry, 1998).

Findings from this body of research have revealed that autonomy-supportive, structured classrooms that offer meaningful learning tasks for students to master over multiple sessions best promote children's' SRL engagement (Perry & Rahim, 2011). Specifically, elementary children were able to identify effective strategies students could use – or that they had used themselves – for self-regulating their writing (Perry & VandeKamp, 2000). Most students (78%) mentioned help-seeking strategies, such as seeking help from their teacher, parent, or peer if students were experiencing difficulties with a writing project. Additionally, 30% of students mentioned using strategies to persist in the face of difficulty, such as paying attention to the teacher or "try very, very hard" (Perry & VandeKamp, 2000, p. 839). Therefore, in elementary classrooms where instructors were observed explicitly promoting SRL practices, elementary children reported greater knowledge of and engagement in SRL.

**Investigating classroom motivational climates.** Additionally, a line of research investigating the impact of instructional practices on classroom motivational climates has been conducted utilizing the Observing Patterns of Adaptive Learning (OPAL; Patrick et al., 1997) protocol for classroom observations (e.g., Morrone, Harkness, D'Ambrosio, & Caulfield, 2004; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Patrick & Ryan, 2008). The OPAL was designed "around narrative running records of teacher and student behavior observed during classroom instruction" (Patrick et al., 1997, p. 1). Researchers utilizing the OPAL recorded and coded observational data based on categories grounded in achievement goal theory (Patrick et al., 1997). Although this body of research was not focused on SRL instructional practices specifically, utilizing a running record observational approach guided by a specific theoretical framework is an appropriate method for evaluating SRL practices within a classroom context.

### Purpose of Study

Although past research efforts have made great strides in investigating SRL-supportive instructional practices in K-12 classrooms, a critical need exists for studies that seek to understand contextual aspects of postsecondary classrooms that support students' SRL development. The purpose of this study was to investigate postsecondary instructional practices that may support students' SRL in an undergraduate mathematics course, specifically, precalculus. Understanding these instructional strategies can help educators identify pedagogies that contribute to student success in traditionally demanding college courses. This study contributes to research on SRL instruction in postsecondary education by examining an instructor's extant integrated teaching practices through observation. In this manner, we sought to discover which instructional practices, if any, were already in place that might influence students' SRL in courses with historically low success rates. To accomplish this task, the following research question was posed: What types of instructional practices are utilized in a college precalculus classroom that could influence students' self-regulated learning for the course?

## Method

### Participants

Participants were a university mathematics instructor, students enrolled in two sections of her undergraduate precalculus course ($N$ = 645), and eight peer tutors at a large southeastern public research university. The observed instructor (who will be referred to as "Ms. Math" for the remainder of the article) was a female lecturer in the mathematics department who also taught courses for the natural sciences and mathematics teacher certification program at the university. Ms. Math had taught at the university for 10 years at the time of data collection; her instructional practices have been institutionally recognized by a university teaching excellence award. Although demographic data were not collected for the student participants, the university where the sample was taken is diverse with no ethnic majority. In 2012, university students reported their ethnicities as follows: African American (11%), Asian American (19%), Caucasian (32%), Hispanic (25%), International (9%), Multiracial (3%), and Other (1%). In addition, the reported mean age of undergraduate students was 22.5 years.

### Observational Protocol and Data Collection

The Self-Regulated Learning Observation Protocol (SRLOP) was developed by the research team to investigate instructional practices in college classrooms that can support students' SRL for a particular course. Specifically, the SRLOP was designed to utilize in the undergraduate mathematics course studied. Although designing an observation protocol was not an original study objective, the instrument was created in order to answer our specific research question. Therefore, the framework that emerged is both a product and measure of this research project. The SRLOP is based on Pintrich's (2000, 2004) model of SRL and includes multiple categories of instructional practices that can influence students' SRL. The SRLOP coding structure categorizes observed teacher and students' behaviors and statements according to the four areas of learning that students can control (i.e., the four aspects of SRL):

(a) cognition; (b) motivation and affect; (c) behavior; and, (d) context. A description of the final SRLOP coding categories within these four areas will be presented with the results as they emerged and were refined throughout this research project.

The OPAL development process outlined by Patrick and colleagues (1997) strongly guided this project's observation process and the creation of the SRLOP. The protocol is both a product of a priori theory (i.e., Pintrich, 2000, 2004) and a grounded theory approach. During the first class of the fall 2011 semester, the first author observed one class of one section of Ms. Math's precalculus course with instructor consent. Enrollment in this course was 500 students, and it was taught in a large lecture hall; therefore, the researcher was able to observe unobtrusively by sitting in the back of the room. During the first class, the researcher recorded narrative running records of what occurred in the classroom, paying particular attention to comments the instructor made regarding students' SRL practices in the four areas of learning which were relevant to research interests. This observer made note of time throughout observation, documenting events in sequential order. This type of observational strategy is aligned with the method used by Perry and colleagues (Perry, 1998; Perry & VandeKamp, 2000; Perry et al., 2007; Perry et al., 2002); we chose this approach to get a sense of what naturally occurred in the classroom and how, or if, Ms. Math promoted students' SRL during class time.

The first author observed an additional class session during the second week of the semester to set the standard for data collection and to gain a fuller sense of Ms. Math's instructional behaviors. After the second observation was complete, a second observer (third author) with university teaching experience was trained on the observational protocol by the first author. All subsequent observations were conducted by the second observer for the duration of the semester. Because the observed course met twice a week, the second observer typically attended and collected data during both of the weekly class sessions. Over the duration of the fall semester, a total of 22 periods (33 hours) of classroom activity were observed and recorded.

During the third week of the semester, the presence of in-class peer tutors became a part of normal course procedures. Peer tutors were student staff at the university mathematics department's tutoring center. The tutoring intervention was implemented as part of an institutional and departmental effort to improve student success rates in STEM courses. Moreover, Ms. Math actively worked to incorporate student success initiatives, such as the peer tutoring program, into her classrooms. Tutors typically arrived to class 10 minutes into each class and positioned themselves around the lecture hall. Ms. Math gave in-class pop quizzes ("poppers") during most class sessions which students were asked to turn in at the end of class for a grade; if students needed help solving popper questions, they would raise their hands to solicit a tutor's help. Students could also raise their hands to receive help from tutors during Ms. Math's lectures. This in-class intervention was meant to provide more individualized help to students than is typically possible in large lecture courses.

At the beginning of the spring 2012 semester, the research team met to discuss the fall 2011 data and the themes that emerged from it. A final coding scheme was then developed based on the fall data and Pintrich's (2000, 2004) SRL framework that would be used to code the existing data and to guide future observations. In this manner, the categories within each of the four areas of SRL emerged from the data using the constant-comparison method utilized by grounded theory researchers; that is, we searched for "themes and patterns to build theory" (Glesne, 2011, p. 187) using constant case comparison.

The decision was then made to observe an additional unit of Ms. Math's precalculus course to (a) test and finalize the protocol, and (b) collect a reliable dataset to answer this project's original research question. The precalculus section observed during spring 2012 was much smaller than the previous section (i.e., less than 200 students). Because the in-class tutoring intervention was introduced partway through the semester as it was during the fall, a unit near the end of the semester was selected for data collection to gain insight into what happens during regular instruction time (i.e., at a time in the semester when both students, tutors, and instructor had settled into their "normal course routine"). Over the course of five weeks, the first and third authors alternated turns observing two consecutive class periods using the new protocol. This rotation schedule was designed so that each observer was able to observe sequential lessons in order to gain a better understanding of how the instructor stopped and started each lesson. A total of 11 hours of observation data (nine periods) were collected during the spring 2012 semester. After spring 2012 data collection was complete, the first and second author met to revisit the protocol and confirm the SRLOP categories before proceeding with data analysis.

**Analysis of the Data**

Once initial SRLOP categories were finalized, the first and second author independently analyzed the same class period of spring data (over 10% of the total observed spring unit) using NVivo 9 qualitative analysis software. The coders (i.e., first and second authors) were guided by a list of coding categories and descriptions designed collaboratively by the research team. Interrater reliability (% agreement) of coding

decisions was then calculated for the double-coded data. Percentage agreement was chosen over kappa because the researchers developed the coding categories together. Therefore, it was deemed unnecessary to take chance of agreement into consideration since researchers should achieve agreement intentionally. After reaching consensus on all codes, the first author continued to analyze the remaining eight class periods of data independently.

Initial calculation of interrater reliability yielded high agreement (≥ 90%) agreement on the majority of coding categories (i.e., the most micro-level data under which data were able to be coded). To reach consensus, the coders discussed categories with lower agreement, revisiting the analyzed data together until 100% agreement was achieved. During the final coding process, additional coding classifications emerged further refining the SRLOP framework. Many of these new classifications resolved ambiguities in the original categories that led to low interrater reliability, helping to confirm the final observational framework and codes. Finally, the first and fourth authors met to complete a member check of final coding decisions. The fourth author ("Ms. Math") was selected for member check to promote higher internal reliability of the coded data (Glesne, 2011).

## Results

A total of 405 statements or "chunks" of spring 2012 observation data were coded under the SRLOP framework. Of the four main SRL categories, the observed instructional practices of the mathematics professor during the final observed unit focused mostly on Cognition (42%), Behavior (29%), and Context (23%), with only 6% of all observed instruction concerning student Motivation and Affect. The final SRLOP included 12 major categories of SRL postsecondary instructional practices within the four areas of SRL (Cognition, $n = 4$; Motivation and Affect, $n = 2$; Behavior, $n = 2$; Context, $n = 4$).

Table 1 displays the percentages of all SRL references made during the spring observation period arranged by SRLOP category. Appendix A includes a complete list of the final SRLOP categories including descriptions and examples of instructional references. SRLOP categories and subcategories are arranged first by area of SRL, then in alphabetical order. Appendix A serves as the final SRLOP framework and can be utilized by future researchers to observe postsecondary classrooms. All references in Appendix A are from the fall 2011 observation data that helped shape the protocol's framework. Instructional strategy results will be presented first by SRLOP categorization. Each category will be described and two examples will be given. Examples provided are from the spring 2012 observation period and have been edited to improve readability and preserve confidentiality of study participants.

### Observed Cognition

The 169 cognitive references made by the instructor during the observed spring 2012 unit divided into four main categories as follows: Metacognition (40%), Test-Taking Strategies (29%), Information Processing Strategies (23%), and Advance Organizers (8%).

**Metacognition ($n = 68$).** References to students' metacognition included the instructor prompting students to engage in metacognitive processes, such as thinking about how to solve a problem or engage in a learning task. Metacognitive statements help students think about their cognitive processes and/or trigger them to do so. Of the 68 references made regarding Metacognition, 72% involved the instructor checking for students' understanding of lecture material and 28% involved her prompting students to think about how to solve a problem or engage with course content.

Example 1:
*"Anyone have questions about how I manipulate the negative sign?"*
Example 2:
*"There are two answers to the question. However, let me ask you a question. What if the measure of the angle is 15, not 30?"*

**Test-Taking Strategies ($n = 49$).** This category contained instances when Ms. Math mentioned specific strategies or resources that students could use while taking an assessment. It should be noted that all exams for this course were administered online via the department's computer lab testing center. Test-taking strategies included ways in which students should have used resources, such as sanctioned formula sheets, as well as cautions against poor test-taking strategies (i.e., specific things students should avoid doing while taking an assessment). The majority of the 49 references to Test-Taking Strategies concerned a formula link that students would need to utilize during the upcoming exam. Although the formulas were available to students via the link, Ms. Math made sure that students understood exactly how they should use the link during test-taking.

Example 1:
*Ms. Math emphasizes the importance of the formula sheet and gives students instructions for using it during the next exam.*
Example 2:
*"Here is the formula sheet. Get to know it well...Here is the formula sheet that will be on the link."*

Table 1
*Instructional References to Self-Regulated Learning Arranged by SRLOP Categories*

| | References | |
|---|---|---|
| | *N* | % |
| SELF-REGULATED LEARNING TOTAL | 405 | 100 |
| Cognition | 169 | 42 |
| Metacognition | 68 | 40 |
| Test-Taking Strategies | 49 | 29 |
| Information Processing Strategies | 39 | 23 |
| Advance Organizers | 13 | 8 |
| Motivation and Affect | 26 | 6 |
| Value | 18 | 69 |
| Interest | 8 | 31 |
| Behavior | 118 | 29 |
| Help-Seeking | 102 | 86 |
| Time Management | 16 | 14 |
| Context | 92 | 23 |
| Student Responsibility | 71 | 77 |
| Task Difficulty | 10 | 11 |
| Instructor Feedback | 7 | 8 |
| Rules and Management | 4 | 4 |

*Note*. Table 1 only reflects data collected during the spring 2012 semester. All percentages displayed represent each category's percentage of the largest category to which they belong. For example, the Cognition category represents 42% the total SRL references ($N$ = 405); Metacognition represents 40% of the Cognition category ($n$ = 169). Therefore, the total number of references displayed in the $N$ column exceeds 405, the total number of SRL references.

**Information Processing Strategies (*n* = 39).** This category included instances Ms. Math mentioned a specific strategy that students could use to process information and/or taught students a strategy to help them learn the course material. These types of statements provide students with tools to process, understand, or display information. The 39 Information Processing Strategies alerted students to problem-solving "tricks" such as using substitution as a tool.

Example 1:
*Ms. Math starts to work out the next example and explains to students a strategy they can use to solve the equation.*
Example 2:
*Ms. Math tells students the name of the strategy she is using to solve this equation (using the conjugate forms).*

**Advance Organizers (*n* = 13).** The least-utilized cognitive reference made by the instructor, Advance Organizers, alerted students to what content would be covered in class that day. This area includes any time the instructor set the tone of the day's lecture by letting students know what content would be covered or prepared them to recognize and process the new material. These statements were usually made at the beginning of class.

Example 1:
*"Let us get started now. Here we go. We are going to study algebra with identity."*
Example 2:
*"Today we are going to start test 4 materials."*

**Observed Motivation and Affect**

The instructor utilized fewer instructional practices concerning aspects of students' achievement motivation ($n$ = 26) relative to the other three areas of SRL. Motivational references fell into two basic categories as follows: Value (69%) and Interest (31%).

**Value (*n* = 18).** This motivational category included instances when the instructor highlighted the importance or usefulness of a task. These statements helped students know what their focus should be and how to better regulate their study time based on the significance of mastering certain tasks (i.e., spend more time studying concepts and tasks that will be well-represented on an exam or relevant to a future career). Ms. Math's statement regarding value were usually explicit (i.e., specific) and not simply ones in which students had to infer the importance of the task. These statements often included the word "important", transparently alerting students to the material critical to comprehend.

Example 1:
*Ms. Math works out a problem and says, "This is important from an identity standpoint."*
Example 2:
*"Here is another one. This one is for engineering, math, and science majors."*

*Interest (n = 8).* In the Interest category, the instructor triggered students' situational interest by making humorous remarks. This includes instances where the instructor gained students' attention by saying something funny, sharing a personal story, or making other types of remarks meant to spark or maintain situational interest.

Example 1:
*"How many times is that now that I have mentioned the link? If any of you forget this, I will personally execute you!" The students laugh.*
Example 2:
*Ms. Math tells students that now is the time to ask questions because she won't be with them on the exam. She says that come exam time, she will be having cappuccino and knitting, and it would be really amazing if she could do that while giving them a review.*

**Observed Behavior**

The 118 behavioral references divided into the two main behavior categories as follows: Help-Seeking (86%) and Time Management (14%).

**Help-seeking (*n* = 102).** This behavioral category included instances where students sought help during class by asking questions and statements Ms. Math made to address the giving or receiving of help. The majority of Help-Seeking references (98%) encouraged students to find assistance or involved students engaging in help-seeking activities during class, and only 2% referred students to resources where they could get help outside of the classroom. Also, most in-class help-seeking involved peer assistance rather than students seeking help from Ms. Math.

Example 1:
*Ms. Math enters the classroom and begins to set up. She talks to a few students as she sets up who have questions.*
Example 2:
*Students communicate with each other to work out the problem.*

**Time management (*n* = 16).** The second behavioral category included instances where the instructor made statements or suggestions regarding students' use of time to prepare for the course outside the classroom. Of the 16 Time Management promptings, 56% reminded students of course deadlines and 44% offered guidance for managing time spent on learning tasks. Ms. Math reminded students of course deadlines as well as institutional deadlines that impacted the course, such as add/drop dates. Time Management statements only comprised 4% of the total SRL references made by the instructor.

Example 1:
*Ms. Math announces that homework is due Saturday, and homework is due today from Tuesday's lecture.*
Example 2:
*"Some of you may be saying, 'Oh my God, she's going so fast!' Yes, I am! I'm trying to speed you up so you don't take 30 minutes on the problems and then don't have time for the free response questions when you take the exam."*

**Observed Context**

Finally, the 92 contextual references made during the observed spring 2012 unit fell into four categories as follows: Student Responsibility (77%), Task Difficulty (11%), Instructor Feedback (8%), and Rules and Management (4%).

**Student responsibility (*n* = 71).** This category included Ms. Math's statements regarding students' responsibility on evaluative tasks, such as exams, homework assignments, quizzes, and class discussion. Ms. Math frequently referenced students' responsibility in her class, and these comments comprised 18% of the total SRL references made during the academic unit. The 71 Student Responsibility statements pointed out material students were specifically responsible for mastering, such as material to be covered on assignments and exams and actions students must take (e.g., memorize a formula or create a formula sheet).

Example 1:
*"Be prepared for this question because it is a quiz question."*
Example 2:
*"You must have this memorized by heart."*

**Task difficulty (*n* = 10).** This contextual category included instances where the instructor highlighted the difficulty level of a learning task. These statements helped students properly evaluate the difficulty level of a task and suggest the level of effort required to complete the task, providing guidance for study time and effort regulation. Task Difficulty statements were surprisingly scarce considering the perceived difficulty level of the subject.

Example 1:
*"Whenever you see double angles, get happy because they're not real hard."*
Example 2:
*"This is a really complicated one."*

**Instructor feedback (*n* = 7).** This category included the instructor's comments that provided feedback regarding students' performance and behavior. For example, Ms. Math would reinforce the asking of questions or discusses performance on past assignments. Instructor Feedback is categorized under context because it is an aspect of the learning environment that can impact students' regulation of cognition, motivation/affect, and behavior. Instructor Feedback was utilized rarely compared to other contextual promptings, but the seven comments made by the instructor praised students for participating in class.

Example 1:
*"Those are good questions. They are great!"*
Example 2:
*Ms. Math makes a small mistake, and students correct it. She thanks students, makes the correction, and then moves on.*

**Rules and management (*n* = 4).** The last SRLOP category included Ms. Math's mentioning explicit and implicit behavioral guidelines, norms, and expectations for the classroom, as well as the procedures by which the classroom functioned. Rules and Management references included covering the class rules on the syllabus along with statements reflecting course policies, such as the usage of cell phones in class. Rules and Management were mainly referenced when the instructor asked students not to talk or reminded them to make their reservations to take the upcoming exam at the computer lab testing center.

Example 1:
*One student asks a question, and the Ms. Math cannot hear her. "Guys, I cannot even hear her. Could you please talk less?"*
Example 2:
*"Does everybody have the reservation for test 4? Make sure you have the reservation for test 4."*

## Discussion

The purpose of this study was to investigate postsecondary instructional practices that support students' SRL in an undergraduate mathematics course, specifically, precalculus. Through observations of an undergraduate mathematics course taught in a large lecture format, we created an observational protocol and then utilized it to code the instructional practices of the observed instructor. This observational protocol differs from extant instruments in that it classifies observed instructional practices by four areas of SRL. We also did not seek to count SRL-instructional practices by category as they were observed. Additionally, the SRLOP is not meant to classify observed classrooms as either high or low SRL supportive, but was designed as a tool to better understand current instructional practices that may support college students' SRL. We are not making claims that Ms. Math's observed practices did, in fact, promote her students to engage in SRL practices for her course; we simply assert that the practices we observed *could* trigger – or guide – students to regulate their own learning.

Regarding observed SRL-instructional practices, we found that through various practices and statements, the precalculus instructor, Ms. Math, focused equally on the areas of behavior and context and spent the majority of her instruction time prompting cognitive aspects of student learning. However, very few references were made to motivational and affective features of education relative to other areas of learning that students can control. We will discuss the implications of these findings, organized by Pintrich's (2000, 2004) areas of SRL.

### Cognition Language

Findings revealed that metacognitive promptings represented 17% of the total SRL references made by Ms. Math during the observed academic unit. Metacognition is a very important aspect of students' SRL (Winne & Hadwin, 1998; Zimmerman, 1989). These types of learning strategies are useful and help students learn new information effectively (McCray et al., 2003). One plausible explanation for the instructor's heavy emphasis on cognition could be the high salience

of cognitive strategies in achieving success in a mathematics course. This finding alone could begin to tell us more about mathematics instruction. Although it cannot be determined how Ms. Math's promptings impacted her students' SRL, our observers were able to recognize Ms. Math's emphasis on this aspect of cognition in the observed class sessions.

**Motivation and Affect Language**

Although cognitive strategies are undoubtedly essential to students' SRL in mathematics courses, motivation also plays a critical role in SRL (Pintrich, 2000; Zimmerman & Schunk, 2007), including impacting the types of strategies students choose to use (Pintrich, 1999) and how much effort they expend (Schunk & Pajares, 2009; Schunk, Pintrich, & Meece, 2008). Cognitive and affective aspects of the classroom environment have been found to be interrelated; students utilize more productive learning strategies when instructors employ motivational instructional practices (Turner et al., 2002). Therefore, the finding that little instructional time was spent fostering students' motivation to learn in the precalculus course suggests an opportunity to enhance Ms. Math's pedagogy. At the end of our study, Ms. Math was trained to integrate more motivational strategies into her normal course instruction. The ended result is that her future students' SRL could improve, ultimately resulting in better success rates in Ms. Math's more challenging courses.

We would also like to point out that although Ms. Math made fewer motivational references compared to other areas of SRL, it is noteworthy that she did utilize some motivational strategies as part of her normal instructional practices. To give some background, our research project developed out of a shared interest and collaborative effort to improve student success in STEM by the mathematics instructor (fourth author) and the second author. The instructor's concern for student achievement could explain the class time she spent fostering student motivation. Ms. Math's use of task and utility value references, specifically, is encouraging. Learners are more likely to put forth higher amounts of effort on learning tasks they find personally relevant and valuable (Cole, Bergin, & Whittaker, 2008). We believe that encouraging more STEM instructors to focus on promoting student motivation could possibly improve students' SRL and academic achievement in historically challenging courses.

**Behavior Language**

According to Pintrich (2004), effective self-regulated learners actively monitor whether or not they need help and then elicit help from reliable sources whenever necessary. One quarter of Ms. Math's SRL instructional practices involved help-seeking; this finding should be interpreted in light of the unique situation of the in-class tutoring intervention. Although help-seeking was a large part of the specific course and unit examined, we realize that this is typically not the case in large undergraduate courses. However, the collaborative learning environment that the weekly pop-quizzes ("poppers") and support of in-class tutors and classmates created might serve as an example of best-practices.

Past research has shown that problem-based environments, where tasks are structured to promote student engagement with course material during class sessions, are conducive to student learning and success in undergraduate mathematics courses (Olsen et al., 2011). Because active problem-solving during class can promote student learning and collaboration, perhaps in-class interventions such as the one we observed would aid in promoting students' adaptive help-seeking behaviors (Ryan, Patrick, & Shim, 2005; Ryan & Pintrich, 1997; Ryan, Pintrich, & Midgley, 2001) in other challenging undergraduate courses.

Additionally, we found that only four percent of total SRL instructional references in a complete academic unit were made regarding time management. Perhaps, the lower number of references could be attributed to the point in the semester when observations were taken. Postsecondary instructors typically discuss course deadlines at the beginning of the semester when the syllabus is covered. Therefore, the observed lack of focus on students' time management could represent postsecondary instructors' tendency to focus heavily on time management at the start of the semester only, leaving students with guidance to manage their time for the duration of the semester. Because effective time management skills contribute to students' success in college (Britton & Tesser, 1991; Pintrich, 2004), it could be useful for instructors to provide students with more temporal guidance throughout the semester, particularly in challenging courses such as precalculus.

**Context Language**

Almost 25% of Ms. Math's referenced instructional practices concerned contextual aspects of SRL. Ms. Math might have focused heavily on contextual aspects of learning tasks due to the challenging nature of tasks (e.g., assignments, exams, and studying) involved in her course. Particularly noteworthy is our finding that 18% of the instructor's total SRL references made during the observed spring unit concerned students' responsibility in the course. SRL is the proactive process through which students become *masters* of their own learning

and performance (Pintrich, 2004), meaning self-regulated learners take responsibility for their learning. We consider Ms. Math's emphasis of her students' academic responsibility a strength of her pedagogy and SRL instruction.

### Future Research

The Self-Regulated Learning Observational Protocol was designed to specifically to investigate the instructional practices in college classrooms that support students' SRL. Although the SRLOP was originally designed for use in an undergraduate mathematics classroom, it could be used to observe any postsecondary classroom and could also be modified for use in secondary education settings where students are given autonomy to control aspects of their own learning. Because our population of interest is college students, we propose potential uses of the SRLOP in postsecondary settings.

The SRLOP could be utilized to compare the SRL instructional practices of college classrooms that vary by size, subject, level, or institution. The information gathered from these types of studies could be used to identify instructional best-practices across disciplines and courses. Identifying how instructors can encourage students' SRL for their courses during regular instruction can benefit both students and instructors (Perry & VandeKamp, 2000). Moreover, the SRLOP can be used in combination with self-report instruments to see if students perceive and respond to instructional promptings to self-regulate their learning. Future studies should investigate whether or not – or to what extent – instructor-initiated strategies impact students' actual SRL engagement.

To best utilize the SRLOP, we discovered that data were most useful when observers recorded all activities that happened within a single class period. Observers using the SRLOP in the future are encouraged to create a continuous record, emphasizing the instructor and his or her statements and behaviors that could impact students' SRL. In particular, observers should describe the categories of events outlined in Appendix A. Findings indicate that recording both verbatim dialogue and commentary is useful, and all final SRLOP categories are suitable for both types of data. A sample of a running record is provided in Appendix B to guide data collection.

To analyze observational data taken utilizing the SRLOP, we recommend using a qualitative analysis software package, such as NVivo, to categorize the data based on the SRLOP categories. Any amount of data can be "coded" under a category (i.e., a few words, sentences, or an entire paragraph), as was done in this study, depending on the context and research purposes. Our results showed that statements or "chunks" of the running record may be suitably coded under multiple categories; therefore, the SRLOP allows for compound-coding of data.

### Suggestions for Postsecondary Instruction

As the needs of American society have changed, so has the role of teachers and faculty (Altbach, 2011; Spring, 2011). For example, STEM instructors have had to make adjustments to the way they teach as the demand for competent STEM graduates has increased (De Vise, 2012; Olsen et al., 2011). Based on the responsibility that the professoriate has to students and society, we recommend that faculty members from all disciplines receive training in effective teaching practices that promote student learning and achievement. Teaching practices based on principles of educational psychology have been shown to be effective in improving college student learning (Bembenutty, 2008) and should be incorporated into all postsecondary courses. It is especially important that students not only be taught *what* to learn, but also *how* to learn. The body of research that can be produced using the newly-created SRLOP has the potential to enhance faculty training and development, ultimately contributing to college students' success.

### Conclusion

Because college students are expected to take full responsibility for their learning (Boekearts, 1999), it is of particular importance to understand classroom attributes that help them to do so. This study is significant because it began to explore extant postsecondary instructional practices that could potentially contribute to students' SRL. These findings can help us begin to better understand why students typically struggle in challenging undergraduate courses, such as precalculus. By expanding the work of Perry and colleagues (Perry, 1998; Perry et al., 2007; Perry et al., 2002; Perry & VandeKamp, 2000) into postsecondary classrooms, we have started to fill a gap in the literature. However, we have only begun to scratch the surface in understanding SRL processes in college classrooms; more studies of how SRL can be taught are needed (Perry et al., 2007), particularly in higher education.

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Appendix A
Final Self-Regulated Learning Observation Protocol (SRLOP) Categories, Descriptions, and Examples of Category References

| Category | Description | Example |
|---|---|---|
| I. COGNITION | The Cognition area refers to ways the instructor encourages students to use specific strategies to learn or perform a task, prompts students to monitor their level of understanding or gauges students' understanding themselves, and prepares students to learn new information. | |
| A. Metacognition | This category includes instances where the instructor prompts students to engage in metacognitive processes, such as thinking about how to solve a problem or engage in a learning task. These statements help students think about their cognitive processes and/or trigger them to do so. | The professor checks with students. "Everybody is OK with that?", "Are we all OK with that?" |
| B. Test-Taking Strategies | This category contains instances when the instructor mentions specific strategies or resources that students can use while taking an assessment. This includes ways in which students should use resources, such as "cheat sheets" or formula links, and poor test-taking strategies (i.e., specific things students should avoid doing while taking an assessment). | The professor emphasizes the importance of the formula sheet and gives students instructions for using it during the next exam. |
| C. Information Processing Strategies | This category includes instances where the instructor mentions a specific strategy that students can use to process information and/or teaches students a strategy to help them learn the course material. These statements provide students with tools to process, understand, or display information. | "What if you do not remember?" The professor draws students' attention and then explains how to memorize a mathematic rule. |
| D. Advance Organizers | This category includes any time the instructor sets the tone of the day's lecture by letting students know what content will be covered, preparing them to recognize and process the new material. These statements are usually made at the beginning of class. | "What we're doing today is sine and cosine of A + B." |
| II. MOTIVATION AND AFFECT | The Motivation and Affect area refers to ways the instructor points out aspects of a learning task that pertain to students' achievement motivation or sparks student interest inside the classroom. | |
| A. Value | This category includes instances when the instructor highlights the importance or relevance of a task. These statements help students know what their focus should be and how to better regulate their study time based on the importance of mastering certain tasks (i.e., spend more time studying concepts and tasks that will be well- | Professor tells students "This one is terribly important." |

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| | represented on an exam or pertinent to a students' future career). A statement regarding task value is usually explicit (i.e., specific) and not simply one in which students must infer the importance of a task. | |
| B. Interest | This category includes instances where the instructor sparks students' interest by saying something funny, sharing a personal story, or other types of statements which may trigger or maintain situational interest. | "Anyone remember Karate Kid? 'Wax on, wax off.' Well, these problems are like that." |
| III. BEHAVIOR | The Behavior area refers to the two main types of SRL behaviors, (A) Help-Seeking and (B) Time Management that take place inside the classroom or instances where the instructor encourages students to engage in these types of behaviors outside of the classroom. | |
| A. Help-Seeking | This category includes instances where students seek help during class by asking questions and statements made where the instructor addresses the giving or receiving of help, typically during class (*Internal*), or also by suggesting outside resources students may use to supplement their learning (*External*). | Students are fairly loud, talking and trying to solve the problems together. (*Internal*)<br><br>"Please go to the math tutoring center if you need assistance…They are open 60 hours a week." (*External*) |
| B. Time Management | This category includes instances where the instructor makes statements or suggestions regarding students' use of time to prepare for the course outside the classroom. These references can be in regard to explicit assignment deadlines or simply offer guidance of how to manage time during study sessions or while completing learning tasks. | Professor encourages students to start homework today so they don't have 140 problems to do right before the due date. |
| IV. CONTEXT | The Context area refers to the task-specific or classroom-specific aspects of the learning environment. These aspects help students regulate their cognition, motivation/affect, and behavior. | |
| A. Student Responsibility | This category includes any statements the instructor makes regarding students' responsibility on evaluation tasks, such as exams, homework assignments, quizzes, and class discussion. These references can explicitly direct students' attention to assessed material or instruct them to take action such as memorizing specific course material (e.g., formulas). | "Listen up! This question is a test 4 multiple choice item."<br><br>"These identities will not be in the test. You should know it by heart." |
| B. Task Difficulty | This category includes instances where the instructor highlights the difficulty level of a learning task and is included in attribution theory. These statements help students properly evaluate the difficulty level of a task and insinuate the level of effort required to complete the task, helping students regulate their study time and effort. | Professor continues to work out the problem. "If you get the idea that this is a tough Algebraic exercise, you're exactly correct." |

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|---|---|---|
| C. Instructor Feedback | This category includes the instructor's comments that provide feedback regarding students' performance and behavior. For example, when he/she reinforces the asking of questions or discusses performance on past assignments. Instructor Feedback is categorized under context because it is an aspect of the learning environment that can impact students' regulation of cognition, motivation/affect, and behavior. | Students propose a solution to the problem. Professor: "…it works great. What a great suggestion! Thank you for the suggestion. I love it." |
| D. Rules and Management | This category includes mentioning the explicit and implicit behavioral guidelines, norms, and expectations for the classroom as well as the procedures by which the classroom functions. This includes covering the class rules on the syllabus along with statements reflecting course policies, such as using cell phones in class. | Professor makes the point clear that there is no extra credit. "I know policies are different at other schools, so I am addressing it right now." |

*Note*. The major 4 areas of self-regulated learning (Cognition, Motivation and Affect, Behavior, and Context) serve as the framework for the SRLOP and are not meant to be coded. That is why no examples are listed for them. Categories that do have examples listed for them in the final column serve as the most micro-level under which data can be coded.

Appendix B
Sample of a Running Record

*KEY: P = Professor; S(s) = Student(s); HW = Homework*

10:00 – Class begins. Syllabus pulled up and P begins class. "Welcome to Pre-Cal class"

P introduces self and covers the rules for her course.

- Don't try to visit me before or after class in this room: "meet me outside after class…I would love to meet with you!"
- There is no email tutoring**;** go to the tutoring center for tutoring (P gave Ss directions to the campus tutoring center)
- "Please go to the tutoring center if you need assistance…they are open 60 hours a week"

10:05 – P discusses the Policy Quiz (some students still entering class). For 1st quiz, students must get 100% correct. Quiz covers course policies.

"I'm going to address question 4 of the quiz head on…if you don't like your grade at the end of the semester, too bad!"

P makes the point clear that there is no extra credit. "I know policies are different at other schools, so I am addressing it right now." She makes sure students know they are responsible for their grade – no extra credit will be given.

Continues discussing policy quiz – there are 20-25 course policy questions and all answers are available on the course website.

After mentioning the course website, P writes down her web address on the board and explains the web address. " I ran an animal rescue mission for years…dept chair thought it was funny to include that in my webpage…so that explains my website."

P explains that on homepage are the Math 13xx policies and discussed where to find answers for quiz. She says, "10% of the class already got 100% on this quiz already!"

10:07 – P begins lecturing: "Let's start right in on test 2 material!" (Ss around me groan and reluctantly take out pens/pencils and paper).

P pulls up the packet notes (found on her website which students are instructed to print and bring to class each time) up on overhead and jumps right into lecture.

P: "This class is all about functions!"

P begins writing on the handout document on the screen and explaining where students can find resources for class. "On the website you can find basic graphs…the 15 most famous graphs."

10:10 – P points students to the course website again "…there is a nice review that you can do…"

P points students to the HW and tells them the first HW due date for the semester. As she works out problems she says "this problem is on the HW…"

P explains that HW due date was extended because of the add/drops that will happen at the beginning of the course (she makes sure students not only know *when* the HW is due, but *why* it is due that particular day).

P talks about domains and continues to highlight text on the screen. She talks very fast, but writes down all that she says on the screen and explains everything that she does.

P says "I think of numbers as people, just like I think of animals as people…"

No real response from Ss as they take notes fast and furiously.

10:11 – S asks a question and P explains: "Good question…sometimes I lose my mind while I'm up here, so just let me know. That's why this is all available on the internet. Feel free to ask questions anytime."

P wants students to point out her mistakes/inconsistencies – she makes it clear that she values their questions/opinions.

10:12 – P moved on to 3rd page of the workbook. Directs students to "look in Ch. 2 lecture notes for a reminder of Vertical asymptotes" because "we're going to do lots with that this semester…"

P continues to write notes on board; Ss take furious notes. No Ss talk or use phones during lecture – too busy taking notes.

10:15 – P makes mistake while working out problem and pauses…

P says: "I'm brain deaf on the first day, this is bad!" No Ss laugh

P moves on with lecture: "OK, regarding evaluation. You all should be working on the practice test pretty soon here….yes, there will be lots of questions in this class with minus signs. So get over your 'minus-sign-itis' by the time you take Calculus."

P works out another problem and points students to what they will need to know for the first test/Pre-Cal class. Makes the comment "this is something I want you to focus on…"

As P works out problems, she continually points on what students need to know for the test, HW, quizzes, etc. She even points out where most students usually miss points: "…there are several places that are point losers…people forget about squaring…"

She continues to work out problem while pointing out comment mistakes: "don't make that mistake in a hurry!"

P explains all her actions and tells Ss "I don't want you to lose points due to test pressure."

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*Note*. This example only contains a portion of a class period ($n$ = 15 minutes) so that the reader gains a better understanding of the running record technique.

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# How and Why Students Learn: Development and Validation of the Learner Awareness Levels Questionnaire for Higher Education Students

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The development of the 21-item Learner Awareness Levels Questionnaire (LALQ) was carried out using data from three separate studies. The LALQ is a self-reporting questionnaire assessing how and why students learn. Study 1 refined the initial pool of items to 21 using exploratory factor analysis. In Study 2, the analysis showed evidence for a four-factor solution (Survival, Establishing Stability, Approval, and Love of Learning). Results of the structural equation modelling and confirmatory factor analysis in Study 3 provided further support for the results obtained from Study 2 and also indicated a higher order Learner Awareness factor. Internal consistency for the four factors was within an acceptable range. The results of Study 3 showed that the questionnaire appeared to be a reliable instrument to measure how and why students learned because the structural equation model fit the questionnaire data well and the confirmatory factor analysis had good fit indices within an acceptable range.

Many questionnaires developed to address student learning processes from cognitive psychology, especially in information processing theories (Moreno & DiVesta, 1991, Schmeck, Geisler-Brenstein, & Cercy, 1991), are intended to address universal and culturally unbiased mechanisms. However, such a framework seems inappropriate to address a context-dependent issue like student learning (Biggs, 1999), where it encompasses student strategy uses such as their approaches to learning, their motives to learn, and their perceptions of the task demands, as well as the awareness of why they learn (Bell, 1993). Further, Biggs (1999) notes that how (the approach) and why (the motive) students learn are also dependent on what they had experienced when learning.

A recent study by Choy et al. (2014) based on the constructivist theory (Feuerstein, Klein, & Tannenbaum, 1999; Vygotsky, 1986) found that students' learning falls into four levels—survival, establishment of stability, approval, and love of learning—and that these levels occurred in all students regardless of achievement levels and are context driven. These learning levels have been subsequently named learner awareness levels because students describe them as being related to their motive to learn and the strategies used, hence their overall experience. The data in this study revealed that students readily talked about their learning experiences in relation to the way they perceived the context of their own learning, hence their "learning awareness." These students explained their experiences in terms of their approaches to learning something and their motive to learn. Questionnaires which help students explore and discover their learning awareness levels can make their learning experiences more meaningful. A careful search of current research literature did not produce any examples of such questionnaires. Therefore, it was concluded that the development of such questionnaires will help both teachers and students gain insight into how and why students learn and provide valuable information for teachers when developing teaching materials and facilitating students. The questionnaire is designed to be adapted to multiple contexts as needed by teachers.

This article describes the development of the Learner Awareness Level Questionnaire, a self-report measure of students' awareness of how and why they learn so as to improve and further develop the learning process in university education. The factor structure of the items on the questionnaire is undertaken using independent samples from two studies where exploratory and confirmatory factor analyses were used. Internal consistency estimates were also computed. Finally, this paper will also address the issue of whether the information gathered using the questionnaire will provide useful information to teachers and educators working with university level students.

## Learner Awareness

Learning occurs when individuals use a combination of affective, cognitive and behavior, or psychomotor learning (Choy, 2002; Hall, 2011). It is a process which results in the continued growth and change in individuals and determines how information is taken in and connected into something that is meaningful. Within the three aspects of learning are multiple levels of learning that progress from the basic surface learning to more complex deep learning (Biggs, 1999). Students often use these three aspects of learning without being fully aware of them. Whether students are able to develop surface or deep learning depends on the direct transmission of information by the teacher but more so by the approaches that they engage in during

the process (Biggs, 1999). Hence the activities carried out in the classroom and reasons why students learn will determine the type of learning that takes place. As students learn, they interact with the world and hence change their conception of things, which expands their awareness through the process (Biggs & Tang, 2007).

Bell (1993) defines student awareness of learning as an increased comprehension of the subject content and the ability to use the material learned. However, this definition does not address the affective aspect of learning in terms of the feelings and attitudes that students have when learning the content material. Further to this, research by Frensch and Runger (2003) found that most learning occurs implicitly, that is without awareness of the learner. However, Frensch and Runger and other similar studies (Chung & Jiang, 1998; Reber, 1993) on implicit learning failed to define what actually takes place during the learning process. There are many issues that remain unexplored such as: the process of measuring implicit learning, the way learning occurs if learners are actually unaware of it, and the role of the three aspects of learning (cognitive, affective, and behavioral) during implicit learning. Frensch and Runger (2003) note that learners are often able to show that they have acquired the knowledge but are unable to verbalize what they have learned. Hence, there must be a certain awareness that learning has occurred although learners are not able to verbalize what they had learned. Aczel (2006) further notes in his studies that there is no evidence of unconscious cognition taking place when learning as it requires the awareness and conscious participation of the learner. Marton and Booth (1997) further stress that many studies on learning had been ineffective in providing relevant information as they took the perspective that learning was something that occurred outside the student and under the control of teachers. The learning process needs to be studied from the perspective of the student as it is an individual construct of what has been learned. Hence, learning is an active process through which students "construct" their own meaning of what they have learned and experienced (Jordan, Carlile & Stack, 2008). Biggs (1999) suggests that students will begin to want to learn when they personally feel a need to know, that is having an interest in, and curiosity about, what is to be learned. They will also adopt learning approaches that are self-directed as well as independent. Entwistle (2000) further argues that there must be "meetings of awareness" where teachers shape knowledge in a way that helps students understand it. This requires teachers to have an empathetic knowledge of what the students already know and how they learn.

Entwistle (2000) suggests that the end result of a process of broadening the awareness of the nature of learning may involve students having a fully developed conception of learning, being aware of the different contexts to which the learning can be used, and being able to adapt it to various tasks. Therefore, the effect of context on learning cannot be dismissed as learning takes its meaning in part on the specific social setting. Students tend to interpret what is required of them in a particular learning situation based on past events (Burnett, Pillay & Dart, 2003). What students believe about learning must also overlap with what they hope to achieve (Beaty, Gibbs, & Morgan, 1997). Hence these students will bring with them a set of aims and attitudes which expresses their individual relationship with a course of study. From this context success and failure are judged in terms of the extent to which students fulfil their own aims. Entwistle and Peterson (2004) further suggested that interest in what they are learning will likely lead to a deep approach while negative feelings towards what they are learning will likely lead to a surface approach. Deep approach here refers to attempts by students to understand and derive meaning from what they are learning which requires having interest, curiosity, and a love of what they are learning, while a surface approach refers to attempts by students to remember lists of disjointed facts without understanding the point the author is attempting to make, and they are likely to study to pass examinations and feel undue pressure about the learning process.

The development of deep thinking in students, essential for critical and analytical thinking, is necessary for meaningful learning to occur. Hence, students need to be active participants in their learning process as all aspects of their lives affect their learning (Raiker, 2009). Research has also found that students are often resistant to an approach that requires them to do more learning independently than a teacher-centered approach where they have less control of the content as well as the context of what is to be learned (Boyle, 2011). Therefore, the learner awareness questionnaire used for frequent administration by the teacher could provide a means for students to access an insight into the development of their learning.

## Methods

The development and verification of the questionnaire was carried out following the methods used by Goh and Matthews (2010) for developing and verifying the Postgraduate Learning and Teaching Questionnaire. This method was used because it provided a systematic approach to analyzing and comparing the data.

### Development of the Learner Awareness Questionnaire

Three key criteria guided the initial development of the questionnaire. Firstly, the questionnaire needed to

be short enough so that production of it would be economical and allow for frequent administration. The instrument was also expected to provide quick, useful information for students on how and why they learn and for teachers to use this information to facilitate learning in their classrooms. Secondly, the items needed to be representative of the important aspects of learning and show an accurate measurement of how and why students learn. Thirdly, a high degree of reliability that showed relevance to students' learning had to be established (Cohen, Manion & Morrison, 2000; Mason, 1996).

The preliminary measure of the learner awareness questionnaire consisted of 36 items. The items in the preliminary version were generated after reviewing the results from the phenomenological study on students' learning awareness by Choy et al. (2014) and existing literature on student learning (Biggs, 1999; Biggs & Tang, 2007; Entwistle, 2000). The items generated were divided into three sections and addressed students' awareness of how and why they learned and how they think about learning. As there was no existing equivalent measure of learner awareness, all the items on the preliminary questionnaire were generated based on results from the study by Choy et al. (2014) and existing literature on learning.

A 5-point Likert scale was used for each item, with a 5 indicating "Strongly agree," 4 indicating "Agree," 3 indicating "Neutral," 2 indicating "Disagree," and 1 indicating "Strongly Disagree." It was decided to have the neutral response choice in the questionnaire because the inclusion of this option allowed it to have better psychometric coherence when the items were considered as a whole, and it would have little effect on the overall reliability and validity (Dassa, Lambert, Blais, Potvin, & Gauthier, 1997). In addition, the study was focused on assessing the convictions of students in terms of their firm opinions about how and why they learn. The neutral response represented a conviction and was different from a "no opinion" and a "don't know" response (Dassa et al, 1997).

The 36-item questionnaire was given to five persons that were academic staff of a university but not taking part in the research. This group of people were requested to comment on the questionnaire for any linguistic ambiguities, and items that had inadequacies were modified. This new instrument was then named the Learner Awareness Levels Questionnaire (LALQ).

## Testing the Instrument

**Study 1 – Exploratory factor analysis.** The 36 item LALQ was administered to 172 undergraduate students (89 females and 83 males) enrolled in a diploma program. The students came from a number of faculties and were all full-time students. The questionnaire was done as a paper and pencil exercise with the consent of each participant. The data was then encoded and entered into SPSS (Version 16) for initial analysis.

Before conducting the Exploratory Factor Analysis (EFA), two indicators were tested for sample appropriateness for such an analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy index was 0.74, and Bartlett's Test of Sphericity was significant $\chi 2 = 1877.14$, $p < 0.0001$, indicating that the sample and correlation matrix were within an acceptable range for the analysis.

The EFA was then used to assess fit, detect possible factor structure, and eliminate non-fitting items. Questionnaire soundness was examined using principal components factor analysis with varimax rotation. The scree plot test and the acceptance of eigenvalues greater than one, together with a comparison of a parallel analysis of an equivalent set of eigenvalues obtained from a random data set of the same size, were used to identify the number of factors likely to be extracted. Only eigenvalues that exceeded the corresponding values from the random data set were retained. Initial analysis with a factor loading of 0.40 was used as the cut off point for variable acceptance. Twelve factors emerged with eigenvalues greater than one, accounting for 65.9 per cent of the variance in the respondents' scores. Rotation converged after 23 iterations. The first four factors accounted for 37.5 per cent of variance in the respondents. The eigenvalues of these four factors, when compared using the parallel analysis of an equivalent random data set, were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded 21 items with loadings ranging from 0.45 to 0.79. Therefore, 21 of the original 36 items were selected for further testing.

**Study 2 – Second exploratory factor analysis.** Another group of 331 students (178 female and 153 male), all enrolled in a diploma program, participated in the study. The age ranges of the sample were as follows: 311 between 16-20, 17 between 21-23, and three between 24-26. These students were all full-time students from a number of faculties. The questionnaire was done as a paper and pencil exercise with the full consent of each participant. The data was then coded and entered into SPSS (Version 16) for analysis.

The KMO measure of sampling adequacy (0.80) and the Bartlett's test of Sphericity ($\chi 2 = 2009.22$, $p < 0.0001$) met the required standards for exploratory factor analyses. EFA's principal-axis factoring with varimax rotation of the 21 items yielded four factors with loadings ranging from 0.42 to 0.86. Eigenvalues greater than one accounted for 51.5 per cent of the variances in the students' scores. The scree test, however, suggested that only three or four factors could be extracted; therefore, these possibilities were

examined. Only items with factor loading above 0.40 were used. In the three-factor solution, the items did not show clear indications that they fell into any of the four awareness levels: survival, establishing stability, approval, and love of learning. In the four-factor solution (Table 1), items related to the four awareness levels clearly loaded into each of the factors. Reliabilities (α) for each of the factors were 0.78 for "Survival," 0.75 for "Establishing Stability," 0.60 for "Approval," and 0.77 for "Loving to Learn." The Cronbach alpha for the "Approval" scale was only 0.60, but its mean inter item correlation of 0.27 fell within the optimal range of 0.2 to 0.4 (Briggs & Cheek, 1986, DeVellis, 2012). The four-factor solution both seemed economical and provided a better interpretation of students' awareness of how and why they learn. The four-factor solution was accepted, and the factors were subsequently labelled as:

- Factor 1 – Survival (nine items). The statements required the students to reflect on their basic universal human need to adapt and survive everyday situations, which Tay and Diener (2011) attributes to individuals attempting to establish well-being. These items are about their fear of authority and fulfilling a need that they have toward learning.
- Factor 2 – Establishing Stability (four items). Students had to reflect on their safety needs (Maslow, 1954), which they perceive needed to be established in their lives. The items were about striving to achieve and having no choice, which are reflective of actions that they can take at this level. The item, "I will just memorize my notes rather than analyze them in order to pass my examinations" was included because it was an approach students will use to ensure success in examinations, hence achieving stability in their lives.
- Factor 3 – Approval (four items). The statements required students to reflect on their need to belong and the need to please others through their actions. The items were reflective of the actions they would carry out to meet the approval of others.
- Factor 4 – Loving to Learn (four items). Students were required to reflect on their "love of learning," adapted from a term Seligman (2002, 2004, & 2011) used to describe an individual's motivation to acquire new skills and build on existing knowledge.

**Study 3 – Structural equation model formation and model testing.** The purpose for Study 3 was to determine whether the 21-item LALQ was suitable for diagnostic purposes with an independent sample through the use of structure modelling (SEM) and confirmatory factor analysis (CFA). As in Study 2, the Cronbach alpha was also determined for this study.

A sample of 356 participants took part in the third study with 180 female and 176 male and all of them were enrolled in a diploma program. These were all full time students from different faculties. The age ranges of these students were as follows: 336 were between 16-20, 17 between 21-23, and three were between 24-26.

In Study 2 the 21-item LALQ was found to have four scales: Survival (nine items, $\alpha = 0.78$), Establishing Stability (four items, $\alpha = 0.75$), Approval (four items, $\alpha = 0.60$ with mean inter item correlation of 0.24), and Loving to Learn (four items, $\alpha = 0.77$). The same 21-item LALQ was administered in Study 3 as a paper and pencil exercise.

**Model Fit**

Data from the 21-item questionnaire were examined using AMOS (Version 20) to test the dimensionality and goodness of fit of the model. Two models were developed and tested for their fit to the data. They were a four-factor baseline model and a four factor hierarchal model. The two models that were tested using CFA and AMOS are shown in Figure 1. The four latent variables are survival, establishing stability, approval, and loving to learn.

Figure 1a represents the baseline model. This represents the most parsimonious and best fitting for the data of a particular group (Dimitrov, 2006) and is the independence (null) model (Kline, 2011), which assumes zero covariances among manifest variables. However, in reality, association between latent factors and manifest variables may occur. Figure 1b represents the hierarchical model. This model represents the hypothesis that a higher order (second-order) factor in this case "learner awareness" has a presumed direct causal effect on the four lower order (first-order) factors of survival, establishing stability, approval, and loving to learn (Kline, 2011). The second order factor is indirectly measured through the indicators of the first order factors.

The model fit for the two hypothesized models were evaluated using multiple fit indexes provided by AMOS. One of the evaluations used was to generate the CFA using the ratio of the chi-square, $\chi^2$ to the degrees of freedom ($\chi^2/df$). The lower the ratio, the better the model fit. Kline (2011) recommends a number less than three as a reasonable indicator of good fit, although ideally the ratio should be close to one; however, this rarely happens if the models are complex and use item level data (Byrne, 2001). Other goodness of fit indices used to assess the adequacy of model fit include the Goodness of Fit Index (GFI), Comparative Fit Index (CFI), and the Root Mean Square Error of

Table 1
*Factor Analysis with Varimax Rotation for the Learner Awareness Questionnaire*

| Scales | Typical Items | Items | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|---|---|
| Survival | My family wants me to study so I think I have no choice but to listen to them | Q1 | .750 | | | |
| | To please my parents, I enrolled in this programme although I do not like it | Q2 | .731 | | | |
| | I study because my parents want me to. | Q3 | .741 | | | |
| | I am studying in this institution because I want to please my parents | Q4 | .670 | | | |
| | I have always thought that I had no choice about going to school | Q5 | .583 | | | |
| | I do my course work because I do not want to disappoint my parents | Q6 | .507 | | | |
| | I signed up for this programme because my friends signed up for it | Q7 | .454 | | | |
| | I give up easily especially when I feel the subjects are difficult | Q8 | .446 | | | |
| | I learn because I want a better future | Q9 | .410 | | | |
| Establishing Stability | I am studying now so that I can have a good job in the future | Q10 | | .794 | | |
| | Passing examinations is important to me for a secure future | Q11 | | .778 | | |
| | I make sure I go for my classes because what I learn can be applied to my future | Q12 | | .652 | | |
| | I will just memorise my notes rather than analyse them in order to pass my examinations. | Q13 | | .616 | | |
| Approval | I think my friends will be impressed if I do well in my studies | Q14 | | | .692 | |
| | I am confident I can do the work required in this programme and graduate on time | Q15 | | | .659 | |
| | I feel confident I can pass my examinations with good grades | Q16 | | | .609 | |
| | I think I will have more friends if I do well in my studies | Q17 | | | .596 | |
| Loving to Learn | I think learning is fun | Q18 | | | | .802 |
| | I find learning interesting | Q19 | | | | .795 |
| | I love learning all through my school year until now | Q20 | | | | .772 |
| | I like to think of new ways to learn something | Q21 | | | | .608 |
| Percentage Variance (after rotation) | | | 14.84 | 26.42 | 37.72 | 46.30 |

Approximation (RMSEA). Kline (2011) and Hu and Bentler (1998) recommend that values greater that 0.900 would indicate a reasonable to excellent fit for both GFI and CFI indexes. The RMSEA value is useful because it is not associated with the latent variable and can be used to obtain parametric confidence level and perform hypothesis testing (Kelly & Lai, 2011). It was recommended that a cut off value of 0.06 will indicate a relatively good fit (Hu & Bentler, 1998).

A summary of the fit indices of the two models is presented in Table 2. The indices of the two hypothesized models showed reasonable fit. However, the

Table 2
*Summary of the Indices of Fit for the Hypothesized Models*

| Model | n | $\chi^2$ | *df* | $\chi^2/df$ | *p-value* | RMSEA | GFI | CFI |
|---|---|---|---|---|---|---|---|---|
| Four factor baseline model | 356 | 303 | 150 | 2.02 | 0.00 | 0.056 | 0.923 | 0.910 |
| Four factor hierarchical model | 356 | 244 | 150 | 1.62 | 0.00 | 0.043 | 0.937 | 0.943 |

hierarchical model had better fit indices than the baseline model. It had a lower $\chi^2/df$ ratio of 2.62 with a *p-ratio* of 0.00 and had better indices for the rest as well (RMSEA = 0.043, GFI = 0.937 and CFI = 0.943). Hence, a general learner awareness factor is presumed to underlie the more specific factors of survival, establishing stability, approval, and loving to learn.

**Internal Consistency**

In order to estimate internal consistency, the Cronbach's coefficient alpha (α) was determined for the Study 3 sample (n = 356). The internal consistency for the four LALQ factors were as follows: survival (9 items), α = 0.76, establishing stability (4 items), α = 0.73, approval (4 items), α = 0.53 and loving to learn (4 items). α = 0.78. Although the α for approval is relatively low, the mean inter-item correlation is 0.22 ,which is within the optimum range of 02 to 0.4 (Pallant, 2011).

## Discussion and Conclusion

The studies in this paper were carried out to construct and validate the LALQ questionnaire for use with university students to assess how and why they learn. In Study 1 with a sample of 172 students, the EFA suggested to narrow the pool items from an initial 36 to 21 items. The EFA in Study 2 with a sample population of 331 students showed that the 21-item LALQ had four factors, namely Survival, Establishing Stability, Approval, and Loving to Learn. Two four-factor models were hypothesized to establish the CFA of the LALQ. The models tested were a four-factor baseline model and a four-factor hierarchical model. The fit indices used provided evidence to support that the two hypothesized models for the LALQ had good fit with the data and the four-factor hierarchical model had the best fit. The four-factor hierarchical model also showed that there was a second order 'learner awareness' had a direct causal effect on the four factors of survival, establishing stability, approval, and loving to learn that were in a lower order. All the 21 items on the LALQ loaded significantly on their factors. Each of the LALQ scale was found to be internally consistent and the values of the Cronbach alpha adequate (Pallant, 2011). The use of this questionnaire on students from other universities, both locally and internationally, would further validate the findings.

The students' responses to the items on the LALQ showed that they were more likely to learn because they wanted to establish stability in their lives by ensuring a good future career and a love of learning, which Seligman (2011) described as the drive to learn something new and continuously seek new learning. These students were less likely to learn because they feared consequences from authority figures. However, they also wanted approval from their families and friends when they did well in their studies. These perceptions of students about how and why they learn were supported by the statistical analysis obtained using confirmatory analyses and AMOS. The analyses, for this sample at least, supported the acceptance of a four-factor hierarchical model as the structural equation model that substantiated a learner awareness factor as a direct consequence. Important reasons why they learned were to secure a better future, to obtain approval from their families and peers, and to satisfy a love of learning. Biggs (1999) noted that students will want to learn if they can see it is important to them. They are also more likely to take an approach that will develop their critical and deep thinking, resulting in lifelong learning.

The LALQ that was validated in this study showed that it could possibly provide useful information about how and why students learn. Accessing the perceptions of students towards learning would provide useful information to teachers and education administrators alike, especially in curriculum design as well as planning learning experiences in and out of the classroom. Further testing needs to be carried out with other populations both locally and with foreign partners. The 21 items LALQ is designed for quick administration and analysis so that there is easy access to information that will be useful as well as current.

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# Cluster Analysis of Assessment in Anatomy and Physiology for Health Science Undergraduates

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Academic content common to health science programs is often taught to a mixed group of students; however, content assessment may be consistent for each discipline. This study used a retrospective cluster analysis on such a group, first to identify high and low achieving students, and second, to determine the distribution of students within clusters based on their chosen program of study. Using a two-step cluster analysis based on five summative assessment scores for 773 undergraduate students, three distinct groups of students were identified: these are described as High Achievers, Standard Achievers, and Low Achievers. High Achievers scored higher in all five assessments compared with Standard Achievers and Low Achievers (all $P < 0.01$). Also, Standard Achievers scored higher than Low Achievers in all assessments. Membership of the High Achievers cluster comprised 15% Midwives, 20% Nurses, 10% Occupational Therapists, 11% Paramedics, 24% Physiotherapists, and 21% Standard Pathway students. This novel approach provides an opportunity for quantitative reflection on assessment in a large group of students with diverse career aspirations. It may be used to distinguish levels of achievement relative to peers within a group and potentially identify students within a program of study in need of academic assistance.

An introductory undergraduate course in Human Anatomy and Physiology is often considered a pre-requisite for further academic study in many health related professions. However, the delivery of common anatomy and physiology content to a varied student group which may contain individuals with different career aspirations can be challenging. Also, the assessment strategy used in such circumstances may focus on demonstrating the mastery of course content, but remain inflexible regarding the diverse career aspirations of the student group. Part of the role of the educator is to provide an appropriate assessment strategy which allows a student the opportunity to demonstrate knowledge and understanding of the course content; however, the development of the assessment strategy should also be sensitive to the requirements of the students. Assessment is important in helping to guide student learning as it both influences the approach to learning (Breckler, Joun, & Ngo, 2009; Marden, Ulman, Wilson, & Velan, 2013) and may confirm the achievement of a learning outcome (Marton & Säljö, 1976). Assessment can be classified as either formative or summative. Formative assessment provides students with appropriate feedback to support the achievement of a learning outcome (Rolfe & McPherson, 1995) and is intended to provide feedback in a non-threatening environment (Dobson, 2008). Formative assessment usually has no course credit assigned to it (Olson & McDonald, 2004; Peat & Franklin, 2003). In contrast, summative assessment is primarily used to grade students (for example, at the conclusion of a study period), often without providing feedback to students on their performance. Scores achieved in summative assessments are often emphasized by both educators and students, and performance in these assessments may be the decisive factor of a students' progression (Lin, Liang, & Tsai, 2012).

Classifying students according to their performance in assessment tasks is a long-standing tradition within academia: it provides a means to grade and rank students with regard to their peers, national standards, or the level to which learning outcomes have been achieved. Multiple, but common, assessment tasks with large and diverse groups of students can present considerable challenges when attempting to navigate through student performance. Therefore, in this research article, we aim to use a novel two-step cluster analysis to group students according to their performance in summative assessments, taken as part of a large introductory anatomy and physiology course by students enrolled in a variety of named health degree pathways. The clustering analysis, which is a form of data mining, identifies clusters embedded in data where a cluster is a collection of data objects that are similar to one another (Everitt, Landau, Leese, & Stahl, 2011; Kaufman & Rousseeuw, 2005; Romero, Ventura, & Garcia, 2008). Cluster analysis techniques can be applied to educational systems such as traditional education, and distant education, as well as to learning content management systems (Darcan & Badur, 2012; Romero et al., 2008). To the authors' knowledge, a cluster analysis has not been applied to summative assessment scores in a large undergraduate introductory course in anatomy and physiology, where the student group consisted of a diverse range of named degree pathways. It was hypothesized that this approach may be used to identify groups of students based on academic achievement and to provide the educators with quantitative data on the importance of each assessment in determining achievement on the course.

## Methods

### Setting

The anatomy and physiology course was a compulsory first-year, first semester course taken by all students enrolled on the Bachelor of Health Science (Standard Pathway) program, and by students on the Bachelor of Health Science program with the named pathways in Midwifery, Nursing, Physiotherapy, Occupational Therapy, and Paramedicine. The course was delivered as a weekly three hour lecture (recorded at the time of initial delivery and made available to all students for the remainder of the course), and a weekly two hour tutorial, over a continuous 13-week period. All lecture slides could be pre-purchased by students, and additional work sheets were used to support learning outcomes in the tutorial sessions. Two 1-hour laboratory sessions were also part of the course, these being a bone and joint dissection (bovine), and a heart and lung dissection (lamb). Students were strongly encouraged to purchase an introductory human anatomy and physiology text, and although not compulsory, attendance at both lectures and tutorials was strongly encouraged.

Each student in the course was assessed using five summative assessments: a weekly on-line multiple choice test, a mid-semester multiple choice test, and a final examination with three separate sections: (1) a multiple choice test; (2) a "matching" test, where content knowledge was examined by matching a list of possible answers to a series of images, statements and diagrams; and (3) a long answer, handwritten section. The weighting (proportion of course credit) allocated to each assessment was 10% for the on-line tests, 30% for the mid-semester test, and 60% for the final exam. Within the 60% total available for the final exam, individual sections of the final exam were allocated weightings of 30% for the multiple choice component, 10% for the matching component, and 20% for the long answer component. All information about assessment weighting, timing, and appeal processes were made available to all students at the start of the course (as hard copy documentation), and available as an on-line document throughout the course. For all assessment tasks, marking rubrics (indicating what would be expected to achieve high, medium, and low marks), indicative sample questions, and suggested revision schedules and topics were provided to all students. Also in weekly tutorials, time was allocated to revision of past exam papers (available on-line), and educators encouraged students to practice answering each of the types of assessment used in the course. For all topics covered in the course, weekly learning objectives were provided; also, it was made clear which learning objectives were to be assessed by each assessment task.

The course attracted students with a diverse range of pre-university educational experiences, including those re-entering formal education following a period of either work or unemployment. Approximately 60% of the students enrolling into the course were direct entrants from their final year at school (students aged 18 years). All students were 18 years or older, and "mature" students were those students 25 years and older. The gender balance was approximately 50:50; however, some named pathway programs (for example, midwifery) were predominantly female (>90 %). Demographics of the students in the course were not specifically collected for this study, as access to both student identity and confidential personal details were restricted in the University's data management system. Anecdotally, at this university, the physiotherapy and occupational therapy pathways attracted fewer mature students (<10%), whereas the paramedicine and midwifery pathways attracted more mature aged students (>75%). Students attracted to the nursing pathway were predominantly female with approximately 20% mature students.

### Data Collection and Analysis

Data were accessed from the University's data management system (ARION), with the approval of the course co-ordinator. Throughout the analysis, de-identified, aggregated data were used, thus presenting no student privacy issues. Although this study did not require a full submission to the University Ethics Committee, appropriate advice was sought from the Faculty representative on the committee, the University Research Advisor, and the University Privacy Officer. A condition outlined by the committee and the University Privacy Officer was that only de-identified, aggregated student data could be accessed for the research analysis; therefore, no individuals could be identified by the researchers, nor could a student identify their own data from the analysis.

The two-step cluster analysis is an exploratory strategy designed to reveal natural groupings (or clusters) within the data set that otherwise would not be apparent. The two-step method has the advantages that no a priori allocation of the number of clusters is required and that the importance of each input variable for the construction of a specific cluster is identified. The method standardizes all input variables but does not allow a missing value for any input variable. Previous (unpublished) pilot work on a smaller data set (n=339) of undergraduate nursing students from an Australian university indicated the suitability of this technique for this application.

All data were analyzed using SPSS (IBM SPSS Statistics 22). Each numerical score for the five assessments was used as an input variable in the cluster analysis. All scores were considered as continuous variables. The range of marks available for each input was 0 – 314 for the online test (online), 0 – 50 for the mid-semester multiple choice test (mid sem), 0 – 50 for the multiple choice section in the final exam (Exam MC), 0 – 20 for the matching questions section in the final exam (Exam Match), and 0 – 30 for the long answer section in the final exam (Exam LA). All inputs were standardized such that no input score was allocated a higher weighting than any other, the number of clusters was determined automatically, and the distance between variables for cluster allocation was determined using the Log-likelihood method. Clusters were compared with a one-way analysis of variance and a Bonferroni post hoc test for multiple comparisons, where the mean difference was considered significant if $P < 0.03$.

## Results

Data were included for 773 undergraduates enrolled in a compulsory introductory course in anatomy and physiology. Missing values were noted in 40 students (4.9%). Any student with a "missing" value for an assessment was excluded from the analysis; however, any student that scored zero in an assessment was included. The two-step cluster analysis elicited a model that was a fair to good fit based on a 0.5 silhouette measure of cohesion and separation. Also, the clusters were well defined, based on the analysis of the centroids for each input – all clusters were significantly different for all inputs. The two-step cluster analysis returned a model with 3 identified clusters, with 339 (43.9 %) students in cluster 1, 280 (36.2 %) students in cluster 2, and 154 (19.9 %) students in cluster 3. The clusters have been described as High Achievers (cluster 1), Standard Achievers (cluster 2), and Low Achievers (cluster 3). This choice of descriptive terminology is an interpretation based on the mean achievement scores for each input variable. The mean and standard deviation of each input variable for the defined clusters are shown in Table 1. Means were compared with a one-way analysis of variance, and where significant, a Bonferroni post-hoc test with adjusted alpha ($P<0.03$). All mean inputs in the High Achievers cluster were significantly higher than those in both the Standard Achievers cluster and the Low Achievers cluster. Also, all mean inputs in the Standard Achievers cluster were significantly higher than those in the Low Achievers cluster.

The spread of each input variable for each cluster is compared between clusters, and with the total group, as shown in Figure 1. For each input in Figure 1, a box denotes the median with upper and lower quartiles as the limits of the box, and imposed on this are point and whisker plots for each cluster, where the point denotes the median for that cluster and the whiskers denote the upper and lower quartiles for the cluster. In the current study, the online assessment was the least important input in determining cluster membership: this means that the input which was least likely to identify the level of achievement was the score in the online tests. This may suggest that a future delivery of the course uses the online component for formative assessment rather than summative; however, when formative assessments are optional with no course credit assigned, there may be a lack of student engagement with them (Kibble, 2007; Marton & Säljö, 1976).

The distribution of programs within each cluster was determined and is shown in Figure 2. The High Achievers cluster comprised 15% Midwives, 20% Nurses, 10% Occupational Therapy, 11% Paramedics, 24% Physiotherapy, and 21% Standard Pathway. The Standard Achievers cluster comprised 9% Midwives, 16% Nurses, 16% Occupational Therapy, 4% Paramedics, 16% Physiotherapy, and 39% Standard Pathway. The Low Achievers cluster comprised 5% Midwives, 16% Nurses, 12% Occupational Therapy, 1% Paramedics, 2% Physiotherapy, and 63% Standard Pathway.

Clusters were identified using a two-step cluster analysis of 773 first year undergraduate health science students completing a compulsory introductory course in anatomy and physiology at a large, publicly funded university. The upper pie indicates the High achievers (n=339 students), made up of 50 Midwifery, 67 Nursing, 33 Occupational Therapy, 37 Paramedicine, 82 Physiotherapy, and 70 Standard Pathway students. The middle pie indicates the Standard achievers (n=280 students), made up of 24 Midwifery, 46 Nursing, 44 Occupational Therapy, 11 Paramedicine, 45 Physiotherapy, and 110 Standard Pathway students. The lower pie indicates the Low achievers (n=154 students), made up of 8 Midwifery, 25 Nursing, 19 Occupational Therapy, 2 Paramedicine, 3 Physiotherapy, and 97 Standard Pathway students.

## Discussion

This study analyzed the academic performance of a group of health science undergraduate students on an introductory course in anatomy and physiology. The majority of students (64 %) were enrolled in degree programs with named pathways leading to recognition and/or registration as a specific health professional, with the remainder (36 %) on a standard pathway. We uniquely used a two-step cluster analysis to identify 3 clusters (groupings within the data) which have been described as High Achievers, Standard Achievers, and

Table 1

*Mean (SD) Input Variables for Each Cluster*

| Two-Step Cluster | | Input variable | | | | |
|---|---|---|---|---|---|---|
| | | Online | Mid_Sem | Exam_MC | Exam_Match | Exam_LA |
| Cluster 1 High Achievers | Mean | 299.8 | 44.4 | 41.8 | 18.7 | 22.3 |
| | SD | 26.1 | 3.6 | 4.6 | 1.7 | 4.6 |
| Cluster 2 Standard Achievers | Mean | 272.9 | 37.8 | 29.7 | 14.5 | 9.8 |
| | SD | 54.3 | 4.5 | 5.1 | 2.9 | 5.1 |
| Cluster 3 Low Achievers | Mean | 216.6 | 28.7 | 20.3 | 8.2 | 3.2 |
| | SD | 82.1 | 5.5 | 4.7 | 3.2 | 3.0 |

*Note*. All variables were significantly different between clusters ($p < 0.03$) using one-way ANOVA and Bonferroni post hoc comparisons.

Figure 1

*Cluster comparison based on summative assessment inputs where the clusters are High Achievers (cluster 1), Standard Achievers (cluster 2), and Low Achievers (cluster 3)*

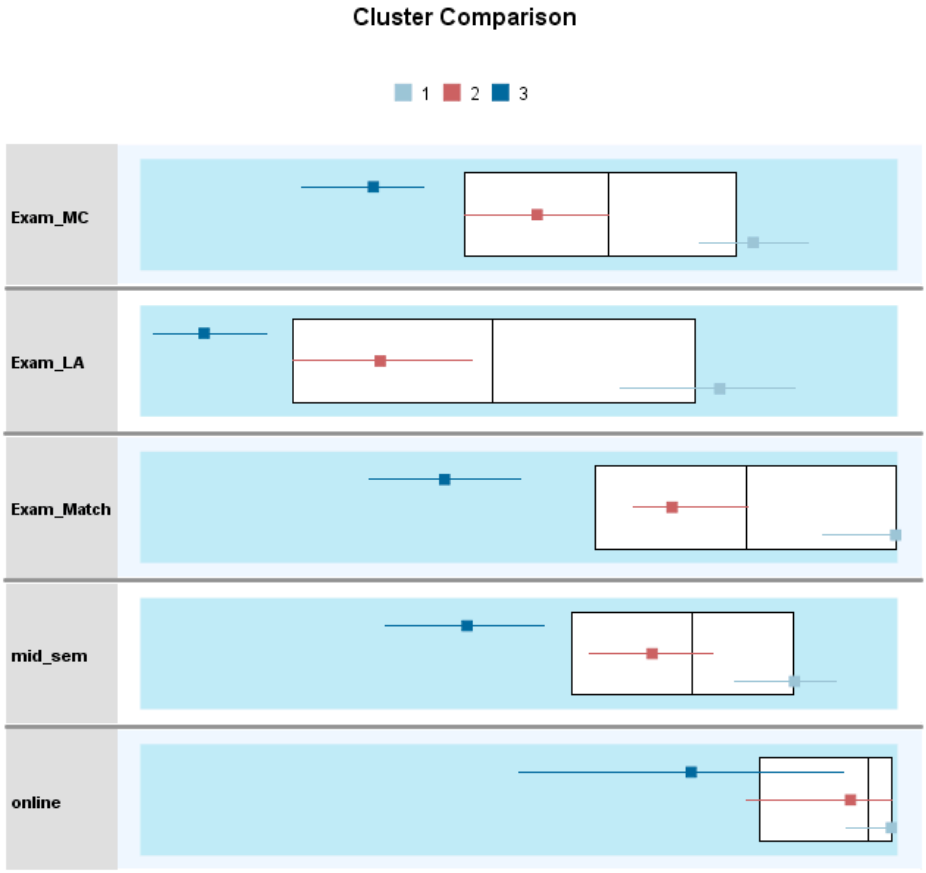
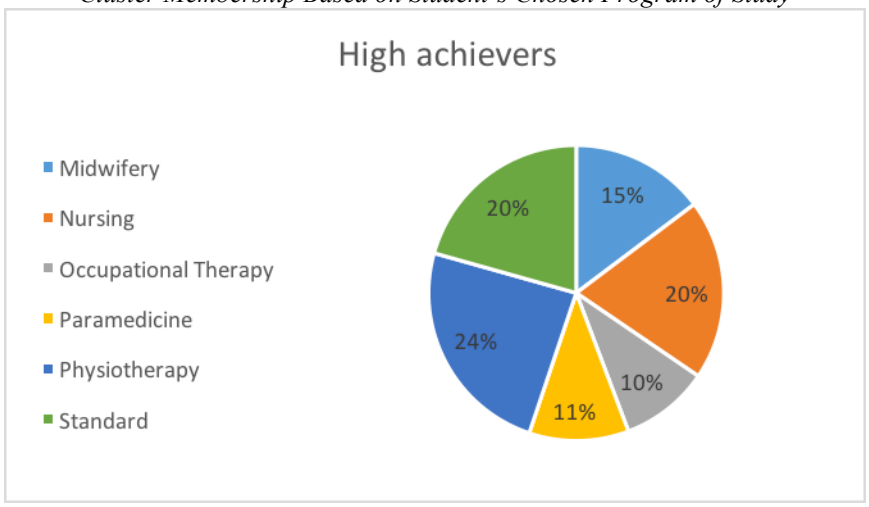
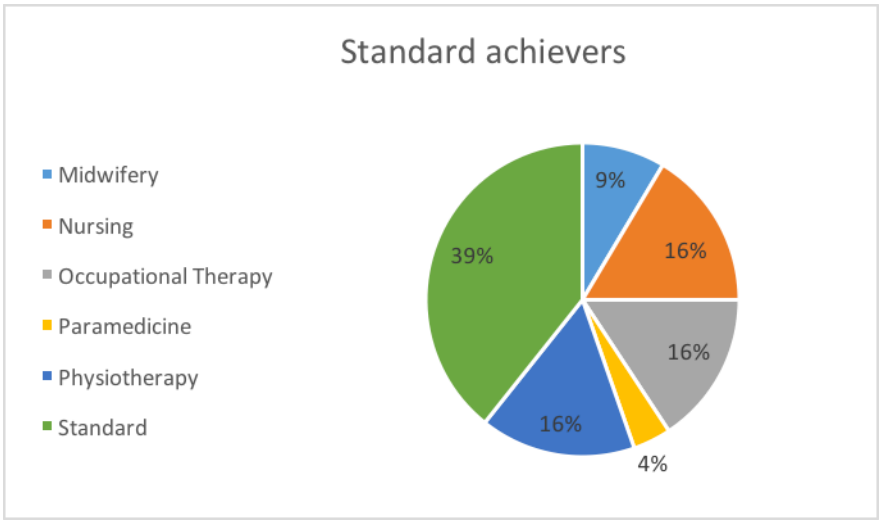
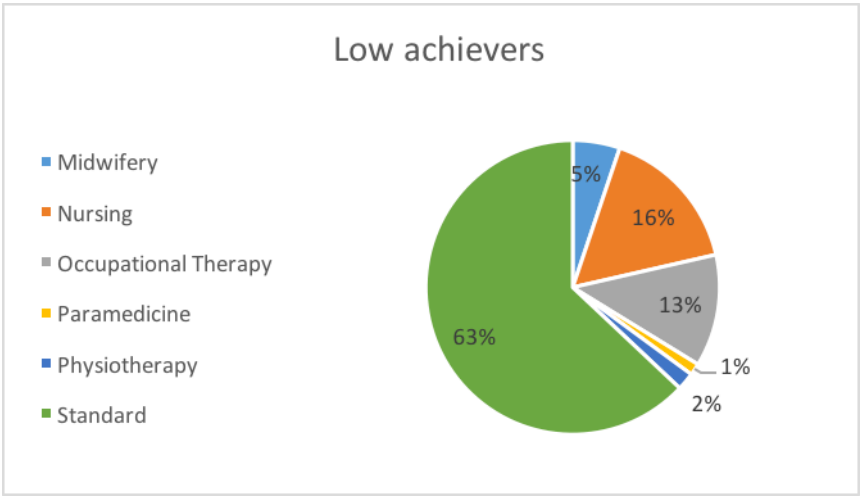


Figure 2

*Cluster Membership Based on Student's Chosen Program of Study*



Low Achievers. The distribution of students on each named pathway was identified within each cluster, thereby allowing academic performance to be compared between students in the same cluster and between students on the same program in different clusters.

Our analysis strategy allowed those students who were considered Low Achievers to be identified early in their undergraduate education. Based on this approach, a more strategic allocation of resources to students who may benefit from extra assistance—for example, additional tutorial opportunities, mentoring, peer assisted study support, tutor-led seminar sessions, and/or discussion groups designed to enhance learning skills—may be implemented. The cluster analysis did not take into account the final grade achieved by any student. Attainment of a pass for the physiology course necessitated a combined aggregate score of at least 50 %, and this was not a criteria for inclusion into a cluster. Therefore, it is possible that all students, including all those in the Low Achievers group, passed the course. Although a high pass rate may satisfy some requirements for future progression within the University, it may have limited use in course evaluation, planning, and the progressive evolution of the course. Thus, we suggest that the cluster analysis, as described in this study, is a more useful mechanism by which student performance in a course can be evaluated.

The cluster analysis technique has the advantage that the construction of the cluster was based on each input and that students could be compared against their peers within the same cluster. This is beneficial to educators because a cluster may show a consistent pattern of scoring either higher or lower in some inputs, thus highlighting a benefit or disadvantage to some students. This may also identify a consistent weakness in a group of students, for example, students with a particular interest in one area of content (e.g., an interest in musculoskeletal anatomy common in physiotherapy and occupational therapy students) may score well in one assessment, and poorly in another. However, the failure to grasp a particular area of content, for example neurophysiology, may indicate a poor understanding of an underlying concept (e.g., chemistry). Thus, the cluster analysis may identify groups of students who are stronger in some areas of science and weaker in others. At this University, enrollment in a named pathway (e.g., Bachelor of Health Science in Midwifery) occurred at the point of entry, in contrast to some universities which use academic performance in a common suite of courses to determine suitability for named pathways. We suggest that the cluster analysis may be a useful approach to identify high achievers, thus providing a quantitative rationale for discriminating students into appropriate courses.

The largest group in the low achieving cluster were students who were enrolled in the Bachelor of Health Science (Standard pathway). This may suggest that this program attracted less academically able students at the point of enrollment. However, the second largest group in the high achieving cluster was also the Standard pathway students, suggesting that some students in this program were equally capable of attaining success in their academic work. At this University, the named pathways within the Bachelor of Health Science have traditionally chosen students at enrollment based on their past academic performance, with entry into physiotherapy and paramedicine pathways attracting students with the highest past academic performance. Our analysis suggested that students on these named pathways continued to achieve high academic success, with only five students from these named pathways in the Low Achievers cluster.

It has been suggested that the theoretical underpinning of biological sciences in undergraduate nurse education has been borrowed from medicine (Akinsanya, 1987) where the biological sciences, including physiology, genetics, pharmacology and biochemistry, are both fundamental to nursing knowledge and an essential part of the nursing curriculum (Trnobranski, 1993). However, some aspects of the biological sciences were perceived as difficult by many student nurses (Scalise, Claesgens, Wilson, & Stacy, 2006), and although physiology was considered an essential part of nurse undergraduate education (Davis, 2010), knowledge of the sciences which underpinned undergraduate physiology was limited. Others (Jordan, 1994; Jordan & Reid, 1997) have stated that knowledge of physiology was perceived by health professionals as important, essential for questioning medical decisions and ensuring patient safety, but was limited in its undergraduate delivery. In the current study, the Low achievers cluster was populated by 25 nursing students (18.1 % of all nursing pathway students), suggesting that some undergraduate nursing students struggle with anatomy and physiology content. While this may be multifactorial, the lack of specific application of the physiology content to nursing may be a contributing factor. The delivery of compulsory anatomy and physiology content to nursing and midwifery students has presented some problems at this University, where a reluctance exists to allow students to be taught "outside" of their discipline. The cluster analysis reported in this study may provide empirical evidence on which to support (or reject) the benefit (or lack thereof) of combining students on different degree pathways in an anatomy and physiology course.

Performance in assessment continues to represent a pivotal role in students' conceptions of learning

science. Teaching and learning which is test oriented may favor students who adopt a strategic learning style (Breckler et al., 2009; Dobson, 2010); however, comprehension of physiology requires students to meaningfully retain facts and competently use those facts in complicated situations (Taradi, Taradi, Radic, & Pokrajac, 2005). Therefore, a strategic approach to learning physiology which focuses on test scores may achieve only limited success. In contrast, in an inquiry instruction environment, for example, process-orientated guided inquiry (Brown, 2010; Vanags, Pammer, & Brinker, 2013), and instruction focuses more on the learning process and evaluation does not mainly rely on the students' test performance (Lin et al., 2012). A student's attitude to the material and their engagement with the course may also influence performance in assessment. For example, completing all tasks on time, attending all scheduled classes, and performing the recommended revision tasks will increase the likelihood of success in assessment. We suggest that a future cluster analysis of a similar group could include psychometric measures (e.g., cognitive and affective components of attitude) and measures of engagement (e.g., commitment and association), and assessment scores.

In this study we have demonstrated the utility of using a two-step cluster analysis on summative assessment scores from a large group of students studying a common introductory course in anatomy and physiology. The identification of a group of high achievers, standard achievers, and low achievers, and the ability to identify the population of these groups based on the named degree pathway chosen by students, represents a technique which can provide an empirical basis for curriculum development.

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# The Effect of Explicit Instruction on Strategic Reading in a Literacy Methods Course

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This study examined the impact of explicit instruction on metacognitive reading strategies among 18 K-8 teacher candidates in a literacy methods course. They received weekly explicit intervention about these strategies over one semester. Collected data included pre- and post-scores of the Metacognitive Awareness of Reading Strategies Inventory (MARSI) before and after intervention, quickwriting notes, literacy lesson plans, and reflection papers. The results showed that the teacher candidates increased their awareness of metacognitive reading strategies after the intervention. They also shared their positive attitudes toward learning about these strategies and plan to implement them in their future classrooms.

Literacy is a critical aspect of students' academic learning. Literacy skills and knowledge are essential in order to for students understand what they learn in school regardless of their subjects and/or grade levels. The National Reading Panel (2000) claims that reading comprehension is one of the most critical elements in building students' literacy skills. Students must have literacy skills for effective learning; however, many students struggle with reading, which hinders their academic success. According to the National Assessment of Educational Progress (NAEP) (2012a), approximately one-third of fourth graders scored below the reading proficiency for their grade level in 2011. Approximately one-fourth of eighth graders did not meet their grade reading proficiency level in 2011 (NAEP, 2012b). These reports demonstrate the need to develop students' literacy skills.

In order to support all students, including struggling students, teachers must implement effective strategies to teach their students well. One effective technique is the use of metacognitive reading strategies. Metacognitive strategies are "routines and procedures that allow individuals to monitor and assess their ongoing performance in accomplishing a cognitive task" (Dole, Nokes, & Drits, 2009, p. 349). Research shows the effectiveness of using these strategies to improve students' reading comprehension (Baker & Brown, 1984). With this evidence, it becomes clear that prospective teachers must have sufficient knowledge about metacognitive strategies and abilities to implement them in their future classrooms because they will influence their future students' reading comprehension and learning in schools. While metacognitive reading in higher education is an ongoing topic of research, there is not much research concerning how teacher candidates learn a variety of metacognitive reading strategies through instruction in the teacher education program. The research is limited regarding how explicit instruction about metacognitive reading strategies impacts their awareness and attitudes toward metacognitive reading strategies.

Therefore, this study aims to explore teacher candidates' learning experiences using metacognitive reading strategies through explicit instruction. The overarching research question is: What is the impact of explicit reading instruction on teacher candidates' views on metacognitive reading strategies? The researcher also considered the following sub-questions: Are there any differences between pre- and post-results of the Metacognitive Awareness of Reading Strategies Inventory (MARSI) (Mokhtari & Reichard, 2002) in the overall score and scores in its three sub-categories (Global Reading Strategies, GLOB; Problem Solving Strategies, PROB; and Support Reading Strategies, SUP)?; What are the teacher candidates' perceptions of metacognitive reading strategies?

## Literature Review

### Revisiting Concepts of Metacognitive Reading

Metacognition is thinking about thinking (Anderson, 2002, 2005; Hacker, 1998). It evidences a person's ability to reflect on what is known and is not merely the process of recalling or of describing events or activities (Anderson, 2008). According to Baker and Brown (1984), metacognition is knowledge of and monitoring of one's thinking and learning processes. Metacognition plays an essential role in developing learners' ability to monitor their learning process and regulate their learning (Azevedo & Whiterspoon, 2009).

Metacognition involves declarative knowledge, procedural knowledge, and conditional knowledge (Jacobs & Paris, 1987; Paris, Lipson, & Wixson, 1983). Declarative knowledge is the knowledge people have about themselves and about learning strategies which influence the cognitive process (McCormick, 2003). Declarative knowledge in reading means simply knowing strategies, such as skimming, summarizing, and inferring (Carrell, Gajdusek, & Wise, 1998). Procedural knowledge is awareness of one's thought

processes (Jacobs & Paris, 1987), and it refers to knowing or reflecting on how to actually perform the reading strategies (Winograd & Hare, 1988). Conditional knowledge is learners' ability to select and employ specific reading strategies appropriately in various contexts and to evaluate the effectiveness of the strategies (Carrell, Gajdusek, & Wise, 1998; Jacobs & Paris, 1987; Winograd & Hare, 1988). In order to have conditional knowledge, learners need to know when and where to apply declarative and procedural knowledge (Schreiber, 2005).

### Metacognitive Reading in Schools

The National Reading Panel (NRP) views metacognition as an important element of reading (2000). It also points out that students can benefit from instruction using metacognitive reading strategies, thereby improving their reading comprehension (NRP, 2000). Researchers have shown that advanced readers use more metacognitive strategies than less advanced readers (Baker & Brown, 1984; Block & Israel, 2004; Israel, 2008).

Vaughn et al. (2011) looked at the effectiveness of strategic and metacognitive reading strategies among seventh and eighth graders in three school districts. Classes were divided into 27 comparison and 34 treatment classes. Students in the treatment groups received collaborative reading comprehension instruction over eighteen weeks. After the treatment, the researchers found that students who received specific reading instruction demonstrated higher reading comprehension on the Gates-MacGinitie Reading Test than students in the comparison group. This finding concurs with other researchers who show the positive relationship between teaching metacognitive reading strategies and students' reading proficiency (Al-Alwan, 2011; Anderson, 2008; Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Cummins, Stewart, & Block, 2005; Edmonds et al., 2009; Lubliner & Smetana, 2005; Pressley, 2002; Pressley & Gaskins, 2006). Van Keer and Vanderlinde (2010) found that when third graders received cross-age peer tutoring from sixth graders who received explicit instruction on metacognitive reading strategies (e.g., activating background knowledge, predicting, and monitoring) in a treatment group, both groups scored higher on reading strategy use than students in the traditional group.

### Metacognitive Reading Strategies at the Post-Secondary Level

Research on metacognitive reading strategies at the post-secondary level indicates the importance of using these strategies (Alsheikh & Mokhtari, 2011; Lesley, Watson, & Elliot, 2007). Researchers looked at college students' awareness level and use of metacognitive strategies. Othman (2010) reported that students in a teacher education program in Malaysia were aware of metacognitive reading in three areas: self-awareness (e.g., developing questions before reading), text awareness (e.g., recognizing the connection between text complexity and comprehension), and task awareness (e.g., setting goals for reading) and that they used these strategies while reading academic texts. Isaacson and Fujita (2006) reported that among 84 undergraduate students, academically successful students demonstrated metacognitive awareness and strategies more than less successful students. This study implied that more metacognitive awareness and use of the strategies lead to academic achievement.

In addition, five college students, who learned metacognitive reading strategies in reading courses over two semesters, improved their self-regulation skills and reading comprehension at the end of the study (Nash-Ditzel, 2010). The results of this study align with the findings in the study by Cubukcu (2008a), which examined the impact of systematic instruction of metacognitive reading strategies with 130 teacher candidates in the English department. After a five-week instruction, participants in the experimental group improved their vocabulary and reading comprehension skills compared to those in the control group. Metacognitive reading strategies play an important role for college students.

## Method

### Participants

Eighteen K-8 teacher candidates (all females and white) who were enrolled in a literacy methods course participated in this study. All were majors in the elementary/middle school teacher education program. The study took place at a mid-size university in the Midwest in the United States. The participants are in the second stage of the teacher education program (stage 1 = pre-block, stage 2 = field experience 1, stage 3 = field experience 2, and stage 4 = student teaching). They previously took a foundations of literacy course and have some background knowledge about literacy.

### Instruments

**Metacognitive Awareness of Reading Strategies Inventory (MARSI).** MARSI was developed by Mokhtari and Reichard (2002). It measures students' metacognitive reading awareness and use of reading strategies while reading academic materials such as textbooks. The MARSI uses a five-point Likert type scale, ranging from 1 ("I never or almost never do

this.") to 5 ("I always or almost always do this."). The higher the score was, the more a student was aware of, and most likely to use, a particular reading strategy.

The MARSI has 30 items with three sub-categories: (a) Global Reading Strategies (GLOB), (b) Problem Solving Strategies (PROB), and (c) Support Reading Strategies (SUP). There are 13, 8 and 9 items for GLOB, PROB, and SUP, respectively (see Table 1). Global Reading Strategies are strategies "aimed at setting the stage for the reading act" (Mokhtari, Sheorey, & Reichard, 2008, p. 47). Examples include setting purposes before reading, previewing the text before reading, skimming the text, and making decisions about which parts to read closely and which to ignore. Problem Solving Strategies are strategies readers apply when text becomes difficult. Such strategies are adjusting reading speed, using context clues, rereading the text for confirming understanding, or guessing unknown words or phrases. Support Reading Strategies are strategies which readers can apply to help their comprehension with support tools. Using reference materials such as dictionaries, discussing with others for clarifying comprehension, and restating information in one's own words for better understanding are examples of Support Reading Strategies. The participants completed the MARSI at the beginning and end of the semester. The authors of the MARSI report its reliability as .89, using Cronbach's alpha. This study yielded Cronbach's alpha of .86.

**Quickwriting notes.** The researcher asked the participants to reflect on their learning about metacognitive reading strategies four times over the semester. They wrote their reactions, thoughts, and/or questions about their learning experiences. For example, after explicit instruction about the think-aloud strategy, students did quickwriting, using the prompts, "What are your thoughts about the strategy?" and "How do you feel about using metacognitive reading strategies?"

**Literacy lesson plans.** During the semester in which the students took a literacy methods course and participated in this study, they had a three-week intensive field experience in elementary schools. As part of the field experience, the teacher candidates developed literacy lesson plans and taught them in their field classrooms. The number of lesson plans and lesson topics during the field experience varied for each teacher candidate due to their placements and their mentor teachers, but they all taught at least one reading comprehension lesson.

**Reflection papers.** After teaching their literacy lessons to children in their field classrooms, the participants wrote reflection papers about their literacy teaching experiences. They analyzed their lessons from the teacher candidates' perspective. They included their critical reflections on what metacognitive strategies they used in their lessons and how they believed the lessons went. They also wrote reflections from the children's perspective. For example, they reflected on how the children responded to their lessons, particularly the children's engagement in metacognitive reading strategies, as well as how the lesson objectives were met based on the children's performance.

**Data Collection and Analysis**

The researcher collected the pre- and post-Metacognitive Awareness of Reading Strategies Inventory (MARSI) at the beginning and end of the semester. Between pre- and post-MARSI, the researcher provided the students with explicit instruction about metacognitive reading strategies for approximately 20 minutes every week over the semester. For example, they learned about a think-aloud strategy. They read an expository passage and paused at certain points and shared their thoughts orally with their partners.

They also learned about an anticipation guide strategy. This strategy required them to activate their background knowledge before reading and to indicate their responses to questions about the passage before reading. After they read a story, they revisited their responses and modified them based on information gained from reading. They confirmed their answers and/or discussed why they modified their responses. Another strategy introduced during the explicit instruction was an open-mind portrait strategy. After reading a story, the students drew pictures about a main character of the story, wrote down questions, and key information, and concepts about the main character, and shared them with the class. In addition to the MARSI, the researcher collected data, using quickwriting notes after explicit instruction, literacy lesson plans the participants developed and taught to children at their field experience sites, and reflection papers about their teaching experiences.

Using pre- and post-MARSI scores, the researcher used a paired t-test in order to examine if there were any differences among these scores for overall and three sub-categories of Global Reading Strategies (GLOB), Problem Solving Strategies (PROB), and Support Reading Strategies (SUP). For quickwriting notes, lesson plans, and reflection papers, the researcher first organized the collected data. After preparation for the data analysis was complete, she explored the data to get a general sense of it. While exploring the data, she took notes about some key words, comments, and/or ideas that came to her mind. Next, she coded the data by segmenting and labeling and then highlighted key information or some trends about the participants' metacognitive awareness and use of metacognitive

Table 1:
*Three Sub-categories of the Metacognitive Awareness of Reading Strategies Inventory (MARSI)*

| Sub-category | Description |
|---|---|
| GLOB | Setting a purpose (item 1) |
| | Using background knowledge to help comprehension (item 3) |
| | Previewing the text before reading (item 4) |
| | Thinking about whether the text content fits purpose (item 7) |
| | Reviewing the text characteristics such as length (item 10) |
| | Thinking about what to read closely and what to ignore (item 14) |
| | Using text features such as tables and figures (item 17) |
| | Using context clues (item 19) |
| | Using typographical features such as italics (item 22) |
| | Critically analyzing and evaluating the text information (item 23) |
| | Monitoring one's comprehension (item 25) |
| | Predicting text meaning (item 26) |
| | Thinking back to see if guesses are right or wrong (item 29) |
| PROB | Read slowly to understand the text (item 8) |
| | Trying to stay focused when one loses concentration (item 11) |
| | Adjusting reading speed (item 13) |
| | Reading carefully when text becomes difficult (item 16) |
| | Pausing to check one's understanding (item 18) |
| | Visualizing information (item 21) |
| | Rereading for better understanding when text becomes difficult (item 27) |
| | Guessing meaning of unfamiliar words (item 30) |
| SUP | Taking notes while reading (item 2) |
| | Reading aloud when text becomes difficult (item 5) |
| | Summarizing information (item 6) |
| | Discussing information with others to check understanding (item 9) |
| | Underlining or circling information in the text (item 12) |
| | Using reference materials such as a dictionary (item 15) |
| | Paraphrasing information for better understanding (item 20) |
| | Going back and forth in the text (item 24) |
| | Asking oneself questions (item 28) |

*Note.* GLOB = Global Reading Strategies; PROB = Problem Solving Strategies; SUP = Support Reading Strategies.

reading strategies. She then reduced the number of codes by categorizing similar codes into one code that embraced them.

## Results

A paired t-test revealed that there was a statistically significant increase in post-MARSI average score over the pre-MARSI average score overall ($p = .001$) (See Table 2). The pre-MARSI average was 3.24, and the post-MARSI average was 3.56. Regarding three sub-categories of the MARSI, the researcher found that there was a statistically significant difference between pre- and post-MARSI in the Global Reading Strategies (GLOB) category ($p = .007$). A pre-MARSI average score for GLOB was 3.07, and it increased to 3.41 at the end of the semester.

While the results were not statistically significant ($p = .091$), there was still an increase in the average post-score over the average pre-score for the Problem Solving Strategies (PROB). The pre-average score for PROB was 3.68, and the post-average score for PROB was 3.86. For the Support Reading Strategies (SUP) category, there was a statistically significant difference between pre- and post-average scores ($p < .001$). The pre-average score was 2.79, and it increased to 3.13.

Regarding qualitative data, three themes emerged. First, teacher candidates themselves enjoyed learning metacognitive reading strategies. For example, they wrote:

- "I enjoy making comments as I read…I feel I gain a better understanding when I talk myself through it."

Table 2
*Pre- and Post-Scores of the Metacognitive Awareness of Reading Strategies Inventory (MARSI)*

| | Pre-MARSI | Post-MARSI |
|---|---|---|
| Overall | 3.24 | 3.56 |
| GLOB | 3.07 | 3.41 |
| PROB | 3.68 | 3.86 |
| SUP | 2.79 | 3.13 |

*Note.* GLOB= Global Reading Strategies; PROB= Problem Solving Strategies; SUP= Support Reading Strategies.

- "I enjoyed the think-aloud strategy because it really helped me comprehend the text…Thinking aloud myself was an aid in working out my questions and thoughts."
- "This metacognitive strategy helped me comprehend what I was reading."

Second, teacher candidates viewed metacognitive reading strategies as effective and helpful strategies for children. They commented:

- "I think a read-aloud strategy would be a very useful teaching strategy."
- "A metacognitive reading strategy is a good strategy."
- "Teaching before, during, and after reading will help students be more effective readers."
- "I think these strategies are very beneficial for students because then they get into a habit when they read on their own."
- "I think that metacognitive strategies are important in the learning process. When such strategies are used, the reader will gain a much better understanding of the text. The reader will not just skim over the written material but will have to make meaning from it."
- "I think many of these strategies could be very helpful for children…It is very important to constantly check for understanding."

Teacher candidates implemented metacognitive reading strategies, such as activating background knowledge, predicting, setting purposes, questioning during reading, paying attention to main ideas and details, and visualizing, in their lessons at their field sites.

The last theme was that teacher candidates planned to implement metacognitive reading strategies in their future teaching. They wrote the following:

- "I found that learning about metacognitive teaching strategies was very helpful. I will try to implement them into my classroom someday. I will explain metacognitive strategies to my students and then I will use a wide variety of strategies or activities to incorporate my students' metacognitive reading processes."
- "I found them [metacognitive reading strategies] to be useful for my future classroom…I will use some of them for sure in my future classroom."
- "I will begin teaching these [metacognitive reading strategies] by informing the students about how important it is to establish a purpose for reading the text…I will model these strategies so that they become automatic to my students."
- "I will use some of the strategies in the future!"
- "I think they [metacognitive reading strategies] can be manipulated into any grade level."

## Discussion

In this study, the researcher explored the impact of explicit reading instruction on teacher candidates' views on metacognitive reading strategies. The results of this study showed that teacher candidates who received explicit instruction of metacognitive reading strategies over the semester increased their awareness of the use of such strategies from the beginning to the end of the semester. In particular, the average overall post-score on the Metacognitive Awareness of Reading Strategies Inventory (MARSI) increased by 0.32 from a pre-score of 3.24 to a post-score of 3.56. Specifically, the t-test showed that the explicit instruction was significantly effective for the participants. This result suggests that teaching metacognitive reading strategies to teacher candidates in literacy courses can enhance their understanding and awareness of using such strategies.

In fact, the result of this study is similar to the results of other studies, such as those of Cubukcu (2008a, 2008b) who found that students' reading comprehension and vocabulary proficiency improved

after they received instruction on how to implement metacognitive reading strategies. The findings of this study also mirror the results of Lau's study (2006), which investigated the effectiveness of incorporating a reading strategy instruction program among six language teachers with 205 seventh graders. In Lau's study, after the teacher implemented the reading strategy instruction program with an emphasis on metacognitive reading strategies, students significantly increased their usage of these strategies, including inferring word meanings. In addition, the positive impact of teaching metacognitive reading strategies found in this study concurs with Nash-Ditzel's (2010) study, which also showed college students' increased knowledge of metacognitive reading strategies and ability to use them.

In response to a sub-research question, the researcher found that there were significant differences between pre- and post-scores of the Metacognitive Awareness of Reading Strategies Inventory (MARSI) in the scores of its three sub-categories (Global Reading Strategies, GLOB; Problem Solving Strategies, PROB; and Support Reading Strategies, SUP). In particular, this study showed statistically significant positive differences in pre- and post-scores in the GLOB and SUP sub-categories.

While there was no significant difference in pre- and post-scores in the PROB sub-category, it should be noted that the average pre-score of 3.68 was significantly higher on the four-point scale, comparing to the pre-scores in the GLOB and SUP sub-categories (3.41 and 3.13, respectively). Thus, while students still increased their awareness of using problem solving metacognitive reading strategies, it might not reflect as significant an improvement as for other metacognitive reading strategies that had lower pre-scores. The results of this study align with those of other studies, such as Mokhtari and Reichard (2008) and Sheorey and Mokhtari (2008). In the study of Mokhtari and Reichard (2008), 65 eleventh graders took two sets of MARSI, one for an academic reading purpose and another for an entertainment reading purpose. They shared the highest scores in the PROB sub-category on both sets of the MARSI for academic and entertainment purposes, and then lower scores in the GLOB and SUP sub-categories on both sets of the MARSI. In the study by Sheorey and Mokhtari (2008), 150 English-speaking college students and 152 English as a second language (ESL) college students completed MARSI and the Survey of Reading Strategies (SORS), a modified version of MARSI for ESL students (Mokhtari & Sheorey, 2002), respectively. Both groups indicated the highest average score in Problem Solving Strategies (PROB) among the three sub-categories of GLOB, PROB, and SUP.

With regard to teacher candidates' perceptions of metacognitive reading strategies, they showed positive attitudes toward learning and teaching those strategies. They enjoyed learning metacognitive reading strategies over the semester. It is important for them to feel excited about learning these strategies because if they don't enjoy learning them, it could negatively impact their view of metacognitive reading strategies. Therefore, they may not appreciate the effectiveness of these strategies and may not implement them in the classrooms. Just as teachers themselves should first enjoy reading books to be shared with children, teaching metacognitive reading strategies is likely to be more effective if teacher candidates also enjoy them.

In addition, teacher candidates viewed metacognitive reading strategies as useful for their instruction and plan to implement them in their future classrooms. This indicates a positive effect on children's reading skills. Teacher candidates value metacognitive reading strategies and understand their effectiveness. They received explicit instruction about how to use such strategies; therefore, they can employ these strategies when they provide children with instruction in the future. Lombaerts, De Backer, Engels, van Braak, and Athanasou (2009) point out that teachers' beliefs influence how they shape their personal reactions to teaching theories and practices, and how these theories and practices drive their pedagogical instruction in the classrooms.

Some teacher candidates in this study shared that teachers can "work with students early on by modeling asking questions about the book while reading the book aloud to the class." They recognize "teaching metacognitive reading strategies is very important, but modeling is even more important." Modeling is an excellent way to begin introducing specific strategies to children.

Metacognitive reading strategies are evidence-based instruction (National Reading Panel, 2000). A number of research studies demonstrate the positive impact of using metacognitive reading strategies among children (Baker & Brown, 1984; Bereiter & Bird, 1985; Houtveen, & van de Gridt, 2007; Souvignier & Mokhlesgerami, 2006; *Vaughn et al., 2011*). When teacher candidates intentionally teach children how to read effectively using metacognitive reading strategies, the children learn about such strategies.

## Conclusion

This study examined the impact of teaching metacognitive reading strategies among teacher candidates. It showed that teacher candidates increased their metacognitive awareness over the semester after explicit instruction. Van Blerkom & Van Blerkom (2004) note that metacognitive awareness is an essential factor in supporting readers' reading skills and contributes to the success of their learning. Using

metacognitive reading strategies involves learners' self-monitoring. Indeed, Flavell (1976), the founder of the concept of metacognition, asserts that metacognition requires active monitoring. Self-monitoring their reading process helps learners analyze their reading performance critically. Research shows that training students to employ metacognitive reading strategies has a positive impact on their reading comprehension (Allen & Hancock, 2008; Carrell, Gajdusek, & Wise, 1998). Advanced readers tend to use these strategies more than less advanced readers (Baker & Brown, 1984; Kamil 2003; Klingner, Vaughn, & Boardman, 2007). As Curwen, Miller, White-Smith, and Calfee (2010) point out, it is critical that educators are knowledgeable about, and equipped to use, "collaborative, reflective, and metacognitive strategies and instruction" (p. 146). In particular, pre-service teachers, who will be teaching future generations of children, will greatly benefit from learning about metacognitive reading strategies.

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# Blogs, Tweets, and Protests: Learning Movement Theory through Online Case Studies

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This article takes the practical inquiry model as an approach to designing a course on social movements that combines self-directed investigation and group discussion as an avenue for deep learning. For the purpose of developing a case study, a guided approach is provided that allows the students to explore theory on their own and make connections to the case material they discover online. In the process of developing the case study, students are required to journal about their experience and what they discover as they comb through their selected sites. The data can include several elements (e.g., blogs, chat rooms, Facebook, twitter, publications, photos, links to other groups, history, etc.).

In his paper "A Film-Augmented Course on International Social Movements" James DeFronzo describes how his course was designed to survey samples of revolutionary movements through the use of film (1982). Although the experience was positive, one of four major concerns students had was the apparent bias of many films. DeFronzo notes that it is difficult to locate "balanced" treatments of the subject matter (p. 174). Of course, what we seek is not a value free orientation, or even the illusion of one. Sociology is inherently political (Marcuse, 1964), and scholars do not become interested in movements because they are indifferent about them. When they pass on to students the theoretical insights they have about how social movements work and how movements may succeed or fail, they do not do so objectively.

Social movements as "critical communities" are immensely important engines for cultural and social change (Rochon, 1998). From these critical communities arise ideas that move culture (Rochon, 1998). But when we are faced with teaching students how movements work, we sociologists should impart in them a sense of the value of movements in modern complex societies. This is no easy task. Though it is tempting to treat movement theory as another chapter in a text to be covered, Schwartz and Smith (2010) proclaim that we have to move beyond the "transmission of information" goal of textbook driven courses.

## On the Path to Deep Learning

The lecture and discussion methods most often used by instructors fail to dispel the "disconnect that students feel from sociological theory" (Pedersen, 2010, p. 197). Furthermore, the anxiety that students feel at the prospect of having to learn theory is well documented (Ahlkvist 2001; Campbell, 1997; Hickson & Stacks, 1993; Lowney, 1998; Ormrod 2011; Pedersen, 2010; Pelton 2012). In part, the resistance we face from students is related to a greater sentiment of anti-intellectualism. Forsey, Low, and Glance (2013) write that "We can no longer assume that university students are automatically interested in taking up a life of the mind" (p. 482).

James Ormrod (2011) proposes a "case study group" method that allows students to become actively engaged in theory rather than learning passively (or not at all). Ormrod contrasts his approach to teaching social movement theory from those executed by Lofland (1996) and Reger and Dugan (2001), studies he considers to be either too loose or rigid in terms of structure. John Lofland's approach involved having students "select a specific social movement/social change organization," "collect data on it, and write a 20-page sociological analysis" (p. 389). Not surprisingly, even to Lofland interestingly, students overwhelmingly produced sub-par work characterized as "simple history or encyclopedia account(s)" of movements (p. 392). Lofland warns that "if sociological analysis is the result, one must provide a considerable degree of guiding structure" (p. 394).

We concur with Ormrod, that the other end of the spectrum, too much structure, can also be a detriment. Reger and Dugan's 2001 article proscribes a rather intricate exercise where most students are given cards that represent a "resource, an organizational title, or a goal that identifies a group." (p. 335). Though the authors report improved quiz grades for students in courses where the exercise was executed, Ormrod (2011) correctly surmises that "it does not sound like they [students] were engaged in much theorizing of their own" (p. 194). Ormrod writes, "The teacher therefore seems to have retained a central role in relating theory to what students had done in the exercise, rather than students making the connections *through* the exercise" (p. 194).

Ormrod's own recommendation is the use of case study groups, a method which he developed by asking

students to choose a social movement group to focus on for the duration of the semester. He then proceeded to teach the course "so that a different theory was covered each week" (p. 194). Students were then asked to complete a task each week that involved relating their chosen movement to some aspect of the lesson in theory for that week. Ormrod mentions, for example, asking students to find examples of "framing" in their chosen movements following a reading of Snow and Benford (1988), and the subsequent findings were then shared in a group setting (Ormrod 2011, p. 195). Ormrod (2011, p. 198) summarizes that "tighter guidance with the tasks is desirable but that group discussions should be structured more loosely," thereby situating his pedagogical recommendation somewhere between the previously discussed extremes.

What is problematic here is Ormrod's own admission that this was "not an ideal test case" as his students were "all halfway through completing their dissertations" and "had all taken courses in both classical and contemporary theory previously" (p. 194). Indeed, our undergraduates would have a very difficult time making heads or tails out of Snow and Benford's (1998) work for example. The exercise we propose then, retains the exploratory element of choosing one's own favorite movement so to speak, while offering sufficient guidance with the understanding that most of our students "have limited experience with and often superficial understandings of social movements" (Rohlinger & Stamm, 2013, p. 22) when they arrive in class. The activity in this article involves studying online content for the purpose of developing a research paper on social movements. The students find their own social movement website to track during the period of the course.

**The Online Case Study Approach**

There have been numerous types of case studies. Garrison, Anderson and Archer (2001) presented the "practical inquiry model" in which cognitive presence is generated (p. 11). The authors explored higher order thinking that can be evaluated as part of a critical thinking exercise. Lo, Johnson, and Tenorio (2011) studied the effects of online assignments on student satisfaction. Lo et al. state that, "Results confirmed that having students participate in online assignments can promote student satisfaction and foster critical thinking and deep learning" (p. 1). The authors observe that millennial students are "technologically savvy" and "want to stay 'connected'" (p. 2). They then borrow a conceptual model outlined by Garrison and colleagues (2001) that "evaluates online learning environments in terms of their *cognitive presence, social presence*, and *teaching presence*" (p. 2). Others have explored the practical inquiry model for use in K-12 online courses (Liu & Yang, 2012; Vaughan & Prediger, 2014), for example, in order to assess the quality of online dialogue and cognitive presence among students in an online information ethics course (Liu & Yang, 2012). Informational Ethics is an area of research exploring ethical concerns related to computer, information technology, and internet ethics (Liu & Yang, 2012). Another example comes from analysis of distance learning health courses (Li et al., 2014; Pecka, Kotcherlakota, & Berger 2014). For example, Li and colleagues (2014) explore a continuing professional development program as an online method for health professionals' self-improvement. Health professionals provided feedback on the online activities in which they participated and evaluated how their behavior and knowledge changed given this training they received (Li et al., 2014). The authors provide a conceptual model for how a content analysis methodological approach can be used to evaluate health professional responses (Li et al., 2014).

The four stages of this practical inquiry model as a journey towards higher order critical thinking are said to be the triggering event, exploration, integration, and resolution stages (Garrison et al., 2001, p. 9). Though Garrison et al. are concerned with the online learning environment we can apply these insights in our exercise. The triggering event in our case is the marriage of the student to the movement organization. The exploration is included in the individual reflective journals students produce as they collect data on their movement group. The integration stage allows for the group work that includes several elements, one of which is comparing and contrasting the exploratory work of individual students. Lastly, in the resolutions stage the instructor steps in to critique class work and "right the ship," so to speak. The social presence and teaching presence are found in group interactions and instructor-student interactions respectively. When interactions are highly involved, deep learning is said to have been achieved (Lo et al., 2011). Put simply, the practical inquiry model provides a guiding framework for designing coursework that is structured by a high degree of interaction, but loose enough to permit the kind of self-directed exploration that opens the door to deeper learning and critical thought. Others scholars have applied this model with alternative emphasis where collaborative student to student interactions and computer supported collaborative models serve to build skills.

**The Exercise**

It is a difficult task to provide students with research experiences in the classroom given the time constraints, class size, and Institutional Review Board (IRB) requirements. As stated, the Lofland (1996) article presents library research as one approach to

writing up a case study while avoiding the need to apply for IRB approval. The goal of providing an outlet for writing about social movements while avoiding the IRB process has in part motivated the development of this exercise. Our exercise integrates the use of online content to serve as data for the case study approach we offer and is appropriate for small to medium university classroom sizes.

Our students are technologically savvy in many ways; however, as many instructors discover, those abilities do not always transition well when teaching research skills that can involve tasks such as searching for relevant journal articles for a paper. The exercise presented here involves a guided approach for integrating group work and using social movement webpages for the purposes of completing a case study. Through this exercise the students will be able to engage online with their chosen movement. Through this assignment the students, to some degree, place the concerns of their movement at the center of their work (Bevington & Dixon, 2005).

The scholarship on social movement utilization of the internet, communication technology, and other media sources (Bevington & Dixon, 2005) encourages more research into the significance of this medium in mobilization efforts (Schussman & Earl, 2004). Researchers have explored multiple forms of content, strategies, and frames which social movement organizations produce. One approach for collecting data is assigning research that involves examining social movement website content to model what students should seek. The work of Stein (2009), Della Porta and Mosca (2005), and Postmes and Brunsting (2002) spell out the features, issues, and tactics that exist within U.S.-and European based social movements. For example, Stein's work spells out the forms of content included on social movement webpages.

**Triggering Event: Wedding the Student to a Social Movement**

The students' first task would be to find a social movement on the net. The instructor can define a social movement for the class or perhaps a definition could emerge through group discussion. A standard definition that could be employed is that a social movement is a group that promotes social change. By using this definition, an open field develops for the types of social movements that can serve as cases. After defining what a social movement is for the purpose of class instruction, then the next step is to instruct the students to research for a social movement online.

There are diverse numbers of online communities across the political spectrum from which students could select. From Stormfront (Caren, Jowers, & Gaby, 2012) to Occupy Everywhere movements (Juris, 2012) students will find groups that can serve to fill any interest they have in online communities. There are several sources of social movement content that are housed on university webpages such as Notre Dame's Center for the Study of Social Movements and social movement sites such as *Critical Mass*, *Mobilizing Ideas Blog, Interface Journal*, or *Heathwood Press.* Some other examples include the Hunter College Libraries page, which has useful resources and many links to social movement groups, as well as Pamela Oliver's university page, which has several links to social movements or movement relevant themes. We also suggest other sources for identifying social movement groups such as the webpages for US Social Forum, the Direct Action Network, and, for more international journalistic coverage, indymedia.org. The webpage sources can serve as examples in adopting a potential case study site.

**Exploration: Examining Social Movements**

Here the students will begin to journal about their experience and what they discover as they comb through their selected sites. Their data can include several elements such as blogs, chat rooms, Facebook, twitter, publications, photos, links to other groups, history, etc. Some additional guidance can be provided through Stein's (2009) content analysis of social movement websites. The analysis includes a series of content elements such as information, action and mobilization, interaction and dialog, lateral linkages, creative expression, and fundraising and resource generation. The Stein article is essentially a guide on what to look for and why these themes matter for social movement research. Students should also include any journalistic sources on their chosen movement.

**Integration and Resolution: Group Work and Resolution**

In this phase the students assess the "applicability of ideas in terms of how well they connect and describe the issue or event under consideration" (Garrison et al., 2001, p. 4). Garrison et al. suggest that instructors monitor extensively the discussion and evidence that the students integrate the ideas through the group work. Here the student discusses what he or she found in his or her own investigation and compares this to the investigations of fellow group members. As Ormrod (2011) instructs, the students use class time to share their respective research tasks in their assigned groups, and the students address how the theories they have read apply to their cases.

The instructor can provide prompts to move the discussion within groups. Questions could include, "What have you learned about your social movement organization at this point your research?," "What social movement theory best applies to your research at this point?," "What similarities or differences do you see within the social movements groups you have focused on?," and "What source of website data was the most useful in building your case?" This stage ends as the instructor pulls together the groups' discussions into one involving the entire class as Ormrod (2011) suggests. Here the instructor critiques class discussion work and provides additional guidance in applying theoretical concepts. There are a range of questions that could be explored at this stage such as the relationship between online political campaigns and marginalized populations (Della Porta & Mosca, 2005; Red, 2013), the exploration of the dark side of online social movement communities (Garrett, 2006), or perhaps issues of information quality control (Della Porta & Mosca, 2005).

**Potential Pitfalls**

Sociologists typically find it interesting that, when first exposed to the range of movements, students might note that their own political affinities are not represented. As previously noted, the inherently political nature of our discipline is one of the reasons why it is important to study social movements in the first place. Many of these movements will be progressive in nature. But conservative movements, though not often supported by sociologists, are relevant sites of study. A rather extreme possibility in the triggering phase is a student who chooses to explore the Aryan Nations or other Neo-Nazi movements. Such an instance will have to be handled carefully by the instructor who must not alienate the student. There may also be cases where some students choose to explore movements promoting gun ownership while other students explore gun control related groups. Again, the instructor will have to mitigate potential conflicts. We recommend a return to the data content and theoretical guideposts whenever possible. The instructor can explain that sociologists do not always agree with the groups we study, but we can still investigate with fairness with the goal of deep understanding.

We also expect that students will have some difficulties in the exploratory phase, most notably pinpointing what counts as relevant data. This is an issue for seasoned researchers who can be overwhelmed by mountains of data and faced with the daunting task of organizing and finding relevant themes. For this reason we suggest students have taken a prerequisite methods course before attempting this exercise. If this is not possible, set aside some class time for a relevant lesson. Students might also assign too much weight to media reports of movements. Such reports are useful, especially when we consider how movement actors may respond to media coverage, but the instructor will have to provide some limitations and guidelines to help students make their way through what could be an immense forest of information.

Some students might request that the instructor provide a ready-made case study example in order to demonstrate the ideal project. We do not recommend this, however, because of the likelihood that such a blueprint would impinge upon students' own exploratory journey.

## Conclusion

This article takes the practical inquiry model as an approach to designing a course on social movements that combines self-directed investigation followed by group discussion as avenues for deep learning. The paper provides a guided approach that allows students to explore theory independently and make connections to the case material they find online. Apart from engaging students in theory, our approach also becomes an effective vehicle for demonstrating the work necessary to conduct historical, unobtrusive, and online ethnographic studies without spending much time on the nuts and bolts aspect of research methods. This article presents a guide for developing a case study by using social movement website data. This data not only serves to aid students in completing a case study, but also allows students to explore social movement theory concepts.

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# Facilitating Interdisciplinary Competence: Collaboration Between Undergraduate Baccalaureate Nursing Students and Graduate Students Specializing in Communication Disorders

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The fast-paced nature of the healthcare setting, coupled with the number of allied professionals involved, demands accurate and concise written communication. It is imperative that written communication between nursing and allied professionals be clear to ensure that the highest quality of care is provided and that patient safety is maintained. The authors feel the considerations documented by nursing students after reading an interdisciplinary evaluation report have the potential to improve the level of care provided to a patient and the patient's experience of the care, as well as the student's knowledge regarding allied healthcare. Students noted that reading the report had the potential to adjust their expectations of the patient's communication abilities, cognition, or behavior and increase their awareness of the need to modify their own communication skills. If a nursing student understands the possibility of challenges in communicating with patients with communication disorders, this may carryover to future interactions, resulting in better patient care. Understanding patient concerns is critical for nurses, and this data indicates that reading a speech evaluation report provides the nurse with pertinent information.

In most healthcare settings, there are a myriad of professionals who work together to provide patient care. The fast-paced nature of the medical setting, coupled with the number of allied professionals involved, demands accurate and concise written communication. Therefore, it is imperative that written communication between allied professionals be clear to ensure that the highest quality of care is provided and that patient safety is maintained. Concern regarding a lack of education in professional training programs addressing interdisciplinary professional terminology and technical writing was the impetus for this research. Practitioners in both speech language pathology and nursing use jargon and professional terminology in written documentation, but professional training programs provide little to no education regarding language used by other healthcare professionals. Would reading a patient's evaluation report written by a Speech-Language Pathologist help a nurse communicate more effectively with or aid in the overall treatment of the patient? The investigators were interested in determining the efficacy of using interdisciplinary peer review as a means of enhancing knowledge of allied health professions. In addition, this project was designed to determine if peer review of a clinical report serves to enhance learning across disciplines serving mutual patients.

## Literature Review

A framework established by the World Health Organization (WHO) defines inter-professional education (IPE) as education which "occurs when two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (WHO Study Group on Inter-professional Education and Collaborative Practice, 2010, 13). The Institute of Medicine (Greiner & Knebel, 2003), the American Association of Colleges of Nursing (AACN, 2008), and the American Speech-Language-Hearing Association (ASHA, n.d.) joined WHO in recommending IPE in order to improve practice collaboration, communication, and ultimately patient care. Studies have examined the utilization of inter-professional education within clinical placements (Jacobsen, Fink, Marcussen, Larsen, & Hansen, 2009; Opina-Tan, 2013; Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013) and service learning experiences (Kolomer, Quinn, & Steele, 2010). Other studies involve IPE used with standardized patients (MacDonnell, Rege, Misto, Dollase, & George, 2012; Wagner, Liston, & Miller, 2011; Westberg, Adams, Thiede, Stratton, & Bumgardner, 2006), simulations (Benavides-Vaello, Stevens, & Vines, 2014), interactive workshops (Whelan et al., 2005), and case-based video tutorials (Mitchell, Groves, Mitchell, & Batkin, 2010).

In several studies, students reported that an IPE experience was beneficial (Wagner et al., 2011; Whelan et al., 2005) and that it provided valuable understanding of the logistics of inter-professional collaboration (Baxter, Med & Sheffield, 2004; Opina-Tan, 2013). Researchers have concluded that inter-professional education helped students to develop a better understanding of the roles of other healthcare professionals (Baxter et al., 2004; MacDonnell et al., 2012; Opina-Tan, 2013; Wagner et al., 2011; Whelan et al., 2005), as well as providing a better understanding of a students' own profession (Jacobsen et al., 2009). Additionally, studies show that IPE helped to improve

communication skills (MacDonnell et al., 2012; Mitchell et al., 2010), and lessened students' use of profession specific terminology (Suleman, McFarlane, Pollock, Schneider, & Leroy, 2013).

Probably because they are the most closely aligned, many studies include both medical and nursing students (Mitchell et al., 2010; Wagner et al., 2011), either just the two groups or in combination with other allied health professionals including pharmacy students (MacDonnell et al., 2012; Westberg et al., 2006), dieticians (Whelan et al., 2005), and occupational and physical therapy students (Jacobsen et al., 2009; Reeves, 2008). There are also studies which include just nursing and social work students (Kolomer et al., 2010), as well as studies of just speech language pathology students (SLPs) with student teachers (Suleman et al., 2013) or SLPs with occupational and physical therapy students (Page & Morris, 2013). However, there are only a few studies which include both nursing and speech language pathology students within a larger group of professional types (Baxter et al., 2004; Benavides-Vaello et al., 2014). This case study focuses on an IPE experience involving nursing undergraduate and graduate speech-language pathology students.

## Methods

### Diagnostic Reports Assessment

First semester nursing students in a BSN program were asked to rate diagnostic reports written by speech-language pathology graduate students in terms of content, professionalism, and usefulness in treatment. The aim of the assignment was to allow students to experience collaboration within an inter-professional framework; it included students in their second semester of graduate training in speech-language pathology and undergraduate nursing students in the class Nursing 3110, *Theoretical Concepts of Professional Nursing Practice*. NURS 3110 was chosen because of the congruence of concepts between the nursing and speech-language disciplines, such as communication with health care professionals, health promotion, communication with patients and families (oral and written), and critical thinking. First semester students were chosen with consideration of a potentially significant difference in the knowledge base of a first semester nursing student and one that is further along in the program. Faculty felt that an important skill for beginning students was exposure to advanced reporting, as congruent with what is encountered in clinical practice. The choice to allow this potential dissonance was to stimulate students' critical thinking ability to increase understanding of complex concepts. Faculty from both departments met to discuss diagnosis types that students from both groups would typically treat in a real-world setting. The five diagnosis categories were as follows: (a) autism, (b) developmental delay, (c) aphasia, (d) traumatic brain injury, and (e) cognitive communication deficit.

Nursing students were randomly assigned a diagnosis type and asked to write a 10-page research paper (title page, abstract, five pages of content, and peer-reviewed journal references). Additionally, students were provided a sample speech-language diagnostic report (average length of five pages) that matched their assigned disorder. The purpose of the paper and diagnostic report was to help students understand the importance of conducting a systematic review of professional literature, synthesize theory and clinical practice concepts, and organize these concepts to create a relevant professional paper on a health promotion topic. The professional paper was also designed to develop professional writing skills utilizing feedback from faculty and the peer review process. The professional paper classroom instruction was presented incrementally, beginning with information on conducting the literature review, paraphrasing of relevant resources, adherence to APA format, and assimilation of the components into a professional paper.

Clinical faculty members in speech-language pathology were invited to introduce the activity during a weekly meeting of Nursing 3110. At that time, the de-identified evaluation reports were randomly disseminated to each student, along with a copy of a rubric (see Figure 1) to guide their review. Since there were 70 students and five different report types, there were approximately 12 students assigned to each type of report. The sample diagnostic reports were written by graduate students and clinical faculty, and they covered the above-mentioned diagnoses across the lifespan. Nursing students were asked to read the provided report and complete the rubric, anonymously rating the report for its professionalism, content, clarity, and usefulness in treating a common patient. The reports and rubrics were returned two weeks later to the NURS 3110 course instructor.

### Rubric

The rubric used by nursing students to evaluate the diagnostic reports was composed of seven questions, some multiple choice and others open-ended. Questions were designed to elicit impressions of nursing students as to the usefulness and comprehension of speech pathology reports. A total of 70 students completed the rubric and returned it to the course instructor. Percentages were calculated by dividing the number of respondents who selected that particular item by the total number of respondents (n= 70). All respondents

Figure 1
*Rubric for Evaluation of CMDS Diagnostic Reports*

1. As a nurse, to what degree would this report help you in the treatment of this patient?

*Not helpful* *Somewhat helpful* *Very helpful*

2. If you answered "Not helpful" in question number 1, please explain why:

_____Unfamiliarity with professional terminology
_____Inadequate case history
_____Inability to interpret summary/description of test results
_____Other_____

3. Based on information in the report, what could you now take into consideration when communication with this patient? _____
_____

4. What questions do you have for the person who wrote the diagnostic report?
_____

_____

5. How helpful was this report in understanding the disorder you researched?

*Not helpful* *Somewhat helpful* *Very helpful*

6. If you were reading this report about your child or spouse (no medical background), how helpful do you think it would be in understanding their communication abilities?

*Not helpful* *Somewhat helpful* *Very helpful*

7. How would you rate this report on professional tone and content?

*Not professional* *Somewhat professional* *Very professional*

answered all questions. The same rubric was used for all diagnosis- type reports; no between-group comparisons of the report diagnosis topic areas were conducted.

**Results**

1. As a nurse, to what degree would this report help you in the treatment of this patient? *Not Helpful (3%), Somewhat Helpful (24%), Very Helpful (73%)*
2. If you answered "not helpful" in question number 1, please explain why: *3% of respondents answered "Not Helpful." The reasons stated are as follows: unfamiliarity with professional terminology (n = 7), inadequate case history (n=0), inability to interpret summary/description of test results (n = 5), other (too wordy, unfamiliar with testing protocols) (n = 2).*
3. Based on information in the report, what could you now take into consideration when

communicating with this patient? *Trends in responses were categorized as (a) the need to modify their communication with the patient, i.e. provide repetition of information, use gestures; (b) the need to adjust their expectations of the patient's communication, cognition or behavior; and (c) the need to be more patient with patients with communication deficits.*

4. What questions do you have for the person that wrote the diagnostic report? *Trends in responses included (a) what kind of treatment will be prescribed for this patient and did it work? (b) information was difficult to understand/more clarification needed; (c) what caused the problem?*
5. How helpful was this report in understanding the disorder you researched? *Not Helpful (17%), Somewhat Helpful (54%), Very Helpful = 30%*
6. If you were reading this report about your child or spouse (no medical background), how helpful do you think it would be in understanding their communication abilities? *Not Helpful (8%), Somewhat Helpful (47%), Very Helpful (41%)*
7. How would you rate this report on professional tone and content? *Not professional (0%), somewhat professional (10%), very professional= 90%*

## Discussion

Careful analysis of the data revealed several trends. Overall, the majority of the nursing students indicated that reading a diagnostic report written by the SLP would be "very helpful" (73%) or "somewhat helpful" (24%) in the treatment of a common patient. The small percentage of students (3%) who responded reading the SLP report was "not helpful" cited unfamiliarity with terminology/testing procedures or the inability to interpret the summary description of test results. All respondents stated changes they would consider making when communicating with their patient after reading the report. The authors feel the considerations documented by the students have the potential to significantly improve the level of care provided to the patient and the patient's experience of the care. Students noted that they might adjust their expectations of the patient's communication abilities, cognition, or behavior and that the report increased their awareness of the need to modify their own communication skills. If a nursing student understands the possibility of challenges in communicating with patients with communication disorders, this may carry over to future interactions, resulting in better patient care. Understanding patient concerns is critical for nurses, and this data indicates that reading a speech-language evaluation report would provide the nurse with pertinent information. However, they will likely not know specific communication strategies unless further educated. This would merit education by allied professionals in the academic setting or job site.

It was helpful to know that many of the nursing students found information in the report was sometimes difficult to understand and that they would need "clarification" from the SLP in order to understand specific terminology or procedures. This gave the authors hope that professionals in training would feel comfortable approaching a co-worker or allied professional and asking for that clarification.

The majority of students also noted it was very or somewhat helpful (84%) to gain a better understanding of the specific disorder they were assigned to research. This indicates that this activity enhanced their comprehension of disorders outside of their individual research. When asked to put themselves in the place of a caregiver for one with a communication disorder, most (88%) indicated that the report would be at least "somewhat helpful." Forty-one percent indicated it was "very helpful" which indicates either the need for increased clarity on the part of the speech pathologist and/or increased education for nursing students. Ninety percent of respondents rated the report they were assigned as "very professional." This was very encouraging to the authors, and provides validation for our emphasis on technical writing and using peer-review as a means of improving students' writing abilities.

## Conclusions

Based on this data, faculty in both the College of Nursing and the Department of Communication Disorders felt that this exercise was well-suited for introducing students to several facets of interdisciplinary learning such as scope of practice, professional terminology, and the overlap between the disciplines. It seems that there is most likely a need for practical instruction in communication strategies for nursing students. This may be in the form of instruction, role-playing activities, and/or handouts. Nursing students need to have the relevance of this activity explained in advance and a correlation made between the similarity of their lack of knowledge with the professional terminology and that of patients and family members interpreting the same information. This activity also strengthens inter-professional collaboration opportunities to advance research, dialogue among faculty members, shared resources and expertise, and partnerships for grant procurement. This activity is an appropriate and effective way to introduce

students to the concept and practice of inter-professional collaboration that does not require students to be in the same place at the same time with coordinating class schedules.

Future work that will add validity and improve clinical practice with patients includes providing more exposure and interaction between cohorts of nursing and speech-language students, providing nursing students opportunities to shadow patients in speech-language clinics as a community health clinical rotation, and conducting collaborative simulation exercises as a partnership. The activity could be enhanced by improving and expanding the rubric, performing psychometrics on the rubric between group comparisons of diagnosis reports, and recruiting from senior-level nursing students.

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# Moral Literacy Through Two Lenses: Pre-service Teachers' Preparation for Character Education

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In this paper, we explored how well prepared pre-service teacher candidates are to develop moral literacy. With the mandate in Ontario schools to deliver character education, we were intrigued by the question: How well prepared are teacher candidates to deliver on this requirement based on pre-service preparation and the realities of classroom practice in public education? The issue of teacher preparation has been raised as a concern in moral and character education literature (Berkowitz & Bier, 2004; Nucci, Drill, Larson, & Browne, 2005). Based on this inquiry we have concluded that pre-service teachers are not well prepared to fulfill the moral literacy requirement of character education because they lack theoretical background knowledge in moral development. Further, we recognize that the in-service training of practicing teachers is of equal importance to ensure a receptive environment exists for pre-service teachers. The implication of this finding is that for pre-service teachers to be equipped to meet Ministry character education expectations in practice, pre-service programs will need to be improved, and practicing teachers will require ongoing professional learning opportunities that value moral literacy development as complimentary and equal to academic development.

Character education has existed for over a century as either a formal or not so formal component of public school systems in North America (McClellan, 1992). Lickona (1991) posits that "good character consists of knowing the good, desiring the good, and doing the good" (p. 51) and defines character education as the deliberate effort to develop good character based on core virtues that are good for the individual and good for society. Educators have long been seen as influential in the development of society's young through the advancement of moral understanding and aligning action with these understandings. This expectation is currently formalized as character education within North American school systems, including that of Ontario, Canada. Thus, it is reasonable to expect that teacher candidates attending pre-service programs across Canada would be receiving training in preparation for this expectation. In reality, it is not always the case. In fact, the lack of preparation of pre-service teachers to deliver moral/character education has been raised in the literature as a concern (Berkowitz & Bier, 2004; Nucci, Drill, Larson, & Browne, 2005).

Character formation is intrinsic to classroom practices, and the daily life in a classroom is saturated with moral values (Campbell, 2003; Lapsley, 2008). According to Bereiter (2002), there is no value-free knowledge; values are deeply embedded in every aspect of school life. If teachers are to take seriously their responsibility of implementing moral/character education, they first have to gain some theoretical knowledge about moral development through the teacher preparation program and then ground their teaching practice in that knowledge and understanding.

Further, the realities of school environments, presented from the perspective of a practicing administrator, may impede or support any such efforts made by pre-service educators completing their practical teaching experience. Beyond the classroom environment is the school environment, the climate of which is set in large part by the direction of the administration. The pedagogy of administrators reflects their knowledge and understanding of best practices for students' overall development, moral and academic. Administrators who possess knowledge of moral development theory and subscribe to constructivist and developmental type approaches to educational pedagogy may establish routines and expectations for the operation of their school that are consistent with these beliefs. Such administrators are likely to create opportunities for collaboration, attending to the perspectives of the many, allowing for greater autonomy in decision making, and building connections among members of the learning community to create feelings of belonging. Such practices could facilitate development of student moral reasoning and increase the abilities of students to apply their knowledge independently.

In 2007, The Ontario Ministry of Education promulgated the document *Finding Common Ground: Development in Ontario Schools K-12*, which provides guidelines for character education with the expectation that it needs to be fully implemented in practice throughout Ontario schools. Although the document stresses the utmost significance of developing positive character in students, and some implementation has taken place in schools, the questions that we believe deserve our utmost attention are, how well are pre-service teachers prepared to fit character education into an already demanding curriculum and include moral literacy in their everyday teaching practices, and how

effective are practicing teachers in delivering character education presently in our classrooms?

In this paper, we attempt to explore these questions given the present conditions in schools and contemporary character education practices. The implications of these realities are explored and discussed from two different perspectives: pre-service university teacher and the practicing administrator. The recommendations for improving the learning and teaching conditions in faculties of education and public schools are outlined.

## Character Education: An Expression of Society's Priorities

The effects of time and events on the form and function of character/moral education in public schools cannot be ignored. The events and priorities of society influence the nature of educational pedagogy, including the approach to character education. Beginning with the 1920s and 1930s, the early work of Edward Thorndike was highly influential in establishing a "behaviorist" approach to schooling and, perhaps not surprisingly, character education. At this time, prevailing educational pedagogy advocated the transmission of knowledge and skills through exposure, practice, and reinforcement. Similarly, character education was best accomplished by establishing a controlled environment exposing students to the "right" experiences and the "right" habits, and this has become known as a traditional approach (McClellean, 1992).

During the 1960's some members of North American society were advocating a peaceful existence for nations in conflict. At the same time the messaging of society was that hard work and persistence would pay off with the *American Dream* of wealth and accomplishment. This shift in society also influenced character education models, which briefly moved away from the direct instruction methods associated with behaviorist (traditional) approaches. Instead, character education became more about youth finding their own way through values clarification (Simon, 1971), such that one learned how to identify their own values without being influenced by the values of another. This approach, in limited ways, paralleled the educational pedagogy of the day, which advocated a transactional model of exchanges between master and pupil in which the pupil would develop their knowledge and skill necessary for advancement enabling them to achieve the highest levels of success possible.

In the early 1980s pre-service teacher education programs began to shift, moving away from ideas and more toward behavior, focusing more on the skills and strategies of being effective educators (Ryan, 1988). This time period is of particular interest given that a significant proportion of practicing educators today would have been students in such schools during this time. In the 1990's character education once again surfaced as a means to improve the conditions of a society in apparent moral decay. The version of character education proposed was not dissimilar from the direct instruction methods of the 1920s with supporters such as Lickona (1991) and Wynne (1991) advocating the inculcation of the right habits of mind, heart, and body.

In today's society, our youth are exposed to a host of technological advances which make instant and almost constant communication with others (virtually anywhere in the world) a way of life and existence. It is becoming clear that as a result of this environmental exposure today's students interact and develop social norms fundamentally differently from their predecessors. These and other changes in society (e.g., the greater awareness of equity and social justice issues, greater diversity, and the interconnected nature of the economies of multiple nations) call for changes in how we educate and understand those differently wired young minds. This also implies that character education in public schools cannot return to a form that existed previously. That is, whatever preparation is given to pre-service teachers, it needs to reflect the conditions of current classrooms and greater society.

## Pre-service Instructor's Perspective on Teachers' Preparation

As an instructor in an Ontario based teacher preparation program I have often been involved in many interesting discussions with students about the importance of character education and about different approaches to teaching moral values. In these discussions, many students express concern about their level of theoretical knowledge about moral development and often worry about their level of understanding of the required skills to teach character education effectively. Many fear that by the time they fulfill the demanding curriculum requirements, they will not have enough time to include character education in their program. Clearly they are seeing these two entities, cognitive and moral development, as separate bodies.

According to Chang (1994) teaching is "moral by nature" but the question, how to teach children to make sound moral judgments, still causes confusion for many educators. Beyer (1997) argues that teachers must have an ability to consider the moral dimensions of classroom practice in order to develop democratic citizenry in their students. Considering teaching from a moral point of view, many researchers in education agree that teachers' personal values and personal traits, and the ways they express those values in their teaching practices are very much a cornerstone for their students'

character formation (Campbell, 2003; Damon, 2007; Socket, 2006; Sullivan, 2004).

Character formation is intrinsic to classroom practices and the daily life in a classroom is saturated with moral values (Campbell, 2003; Narvaez & Lapsley, 2009). We believe that, in order to better understand their students' potentials or potential limitations in understanding every day morality, they should be equipped with better understanding of the theories of moral development. We also argue that if teachers are to take seriously their responsibility of implementing moral or character education, they first have to gain theoretical knowledge about moral development and then ground their teaching practice in that knowledge.

Many teacher education programs have not yet incorporated the moral aspects of teaching in their curriculum (Cummings, Harlow & Maddux, 2007). In some teacher education programs there is only one session in an Educational Psychology course dedicated to theories in moral development; as a single course it would hardly cover enough ground for understanding of such an important matter in human development, let alone a single session. When and if greater attention will be paid to moral development theory as part of pre-service human development study is hard to say. Due to an overwhelming teacher education curriculum saturated with teaching methods in major subjects, very little space is left for moral education inclusion. As Narvaez and Lapsley (2008) point out:

> The dilemma that teacher education faces, then, is whether it is acceptable to allow character education to remain part of a school's hidden curriculum or whether advocacy for the value commitments immanent to education and teaching should be transparent, intentional, and public (p. 157).

The hidden curriculum is defined as the unwritten social rules and expectations of behavior that we all seem to know, but were never taught (Anyon, 1980). We may expect the students know that arguing with the teacher might not be a good idea, even if the teacher has made an obvious error, and that teacher's prior established rules are to be accepted and followed without questioning. Such rules are rarely explained with a rationale, yet students readily adjust their behavior to avoid negative consequences.

Lickona (1991) states that teachers must help children to understand core values, adapt to them, and act upon them. In the above example, students are very much aware of the consequences of acting against a teacher's decision; what they are not encouraged to do is to consciously reason and act based on their own values or discern whether in fact the issue is a matter of morality or social convention. We argue that teachers who believe they are solely in charge of setting rules for the classroom, expecting students to obey those rules without questioning, find hidden curriculum a place where they literally can hide. Thus, the need for character and moral education becomes necessary not only to build students' understanding about core moral values, but also to help teachers develop sound moral judgments, which involve "defining what the moral issues are, how conflicts among parties are to be settled, and the rationales for deciding on a course of action" (Rest, Thoma, & Edwards, 1997, p. 5).

According to Osguthorpe (2008), good teaching requires a teacher to be content knowledgeable, method skilled and "virtuous in disposition and character" (p. 289). We agree in part with this statement, but argue that teachers also need to have a solid theoretical knowledge not only in the subjects they teach, but also in moral theories and processes associated with character development. If we want teachers to take a serious role as moral agents, they must be able to understand the developmental changes in moral reasoning (e.g., Kohlberg's moral development theory; Piaget's theory of morality) and develop awareness about moral issues their students face in and out of school. They should be able to discern a moral matter from something other, such as a social convention, as suggested by Nucci (2009) with social cognitive domain theory. Further, any discipline must be domain concordant (moral issues treated as such, and social convention issues treated as rules to maintain order) to be most effective and meaningful to students (Thornberg, 2010). This will not happen unless teacher education programs take seriously present character education demands and start emphasizing the moral dimension of teaching. If teaching is to be seen as reflective moral action (Beyer, 1997), then teacher education programs need to provide solid theoretical ground in moral literacy. Beyond the pre-service setting, the classroom context where teacher candidates perform their practice teaching must also keep pace, to ensure a receptive environment exists for these pre-service teachers to experience.

## The Realities of Classroom Practice: An Administrator's Perspective

Character education in public school systems needs to mirror current educational pedagogy which today is a model of transformation. It should also reflect advances in psychological theory, which now recognize the interrelatedness of cognition, emotion, and behavior. The difficulty in accomplishing this is in ensuring the educators who deliver character education have an adequate understanding of moral development theory, and known efficacious character education practices.

From the character education literature it is apparent that such understanding is not common among educators (Berkowitz & Bier, 2004; Nucci, Drill, Larson, & Browne, 2005; Revell & Arthur, 2007). Add to this the challenges of trying to complete a demanding academic curriculum, achieve adequate levels of success on provincial tests, and manage more challenging and prevalent social emotional issues (i.e., mental health issues) than ever before, and the task is daunting to say the least.

To begin, practicing educators must have a consistent understanding of what it means to be morally literate in a pluralistic society (something of a challenge, as the research community is not in agreement about this definition), they must have some theoretical framework upon which to base their practical strategies, and these strategies should be known to be effective in raising moral literacy levels in youth.

At the foundation is the meaning of moral literacy: moral literacy is not merely a collection of facts, but rather a level of competence in both moral judgment (interpretation of facts) and action (behavior) (Vogt, 2008). For these purposes the accepted definition of moral literacy comes from Tuana (2007), and involves complex skills and actions cultivated and strengthened through purposeful efforts of educators within the school environment. These skills and actions are thought to be necessary for youth to develop into responsible contributing members of greater society.

An example of a theoretical framework would be a moral development theory, such as the social cognitive perspective offered in domain theory (Nucci & Turiel, 1978; Nucci & Turiel, 2009; Turiel, 1974). Social domain theory distinguishes between social conventions (rules which facilitate societal operations), moral concerns (principles of justice and human welfare), and personal (personal preferences) domains. Making the distinction between these domains as a practicing educator would seem important in the operation of a classroom. Modeling a thought process to illustrate how adults distinguish between a moral issue (e.g., willfully causing harm to another) and a social convention (e.g., referring to adults with titles) may be part of an educator's practice in facilitating conflict resolution with students. Thornberg (2010) has argued all discipline must be domain concordant and that students will judge an educator as more or less effective according to their practice of meting out discipline aligned with the transgression (e.g., a teacher who refers to a rule when addressing a moral transgression is viewed as less effective than one who identifies the problem as a moral issue).

Within the public school system there exist relations between faculties of education and schools. This relationship is the basis for pre-service teachers to train and practice their skills in a classroom setting under the guidance of an experienced educator. Pre-service teachers are expected to collaborate with associate educators (their host teachers) in the initial planning of lessons and subsequently receive feedback from their associate teachers in their preparation, delivery, and assessment of lessons for the duration of their practicums. Pre-service teachers are in a relationship where most often the associate teachers are viewed as the authorities and are in a position of providing an evaluation of the pre-service teachers. Therefore, it is reasonable to expect that decisions (at least for the duration of the practicum) will be based on the practices of the teacher. This reality makes it especially important that practicing educators receive professional learning opportunities necessary to raise their awareness and understanding of moral development theory and character education practices known to raise moral literacy levels of students. Historically this type of professional development has not taken place (Jones, Ryan & Bohlin, 1998; Nucci et al., 2005; Revell & Arthur, 2007) and, according to Lapsley (2008), is of paramount importance for educators to deliver character education effectively.

Based on research conducted by Milson and Mehlig (2002), most elementary school educators feel they are effective in the delivery of character education, but are also concerned with some disconnect between research findings and practicing educator self-perception. However, within this study, it was revealed that 37.9% of the 270 teacher respondents doubted their ability to positively affect the character of *some* students, suggesting that at least some students seem unreachable. Despite high levels of motivation and persistence with the task of character education, such educators may feel ill equipped to support some students. This study was a self-report from practicing educators and lacked any supporting objective data. What remains to be examined is whether educators who believe they are effective in positively affecting the character development of youth by elevating their moral literacy are in fact effective.

With greater emphasis on achievement in Ontario schools, it is possible that educators are consumed with only one task: that of developing the intellect of students. The mandate to develop student literacy and numeracy levels to Ministry standards preoccupies virtually every educator in the province of Ontario. This reality may lead educators to use moral texts to accomplish the dual task of developing literacy and character simultaneously. To do so, educators must have adequate understanding of the limitations of such texts. First, not all students will comprehend the same message from a text; second, the message of the author is not necessarily what the reader interprets; and third,

not all themes of "moral message literature" are accessible to all students based on their schema for interpretation (Narvaez & Lapsley, 2008). Educators who believe they can impact the moral literacy level of students, and thus impact character by reading and discussing stories with moral components, need first to ensure that students are able to read and comprehend the text suitably.

High yield strategies described by the Ontario Ministry of Education in their recent *School Effectiveness Framework and Guides to Effective Instruction* do provide educators with strategies for assisting students in making meaning from what they read or have read to them. A process of connecting to the text as an individual, or relating material in the text to other texts or the greater world is considered a high yield practice when teaching children how to read for meaning. The process is not about acquiring the "correct interpretation", as some traditional character educator proponents might argue; it is instead to engage readers in actively making their own meaning from what they read. The reality is that every student comes to school with unique life experiences from which their schema is established, and therefore the interpretations of text may vary greatly. Students are able to interpret moral messages as themes of texts; however, the degree to which this is possible is limited by both the reading skills and moral reasoning abilities of the student (Narvaez, 2010). Educators must understand and be prepared to work with these limitations.

When success is measured with curriculum-based tests across the province, educators are forced to prioritize what is taught in the day. This reality may impact the climate of a classroom and the methods used by the educator to manage this environment effectively. An educator who subscribes to methods consistent with a developmental authoritative approach rather than an authoritarian approach will likely have very different classroom climates. The former places greater emphasis on building and sustaining relationships and is borne out of a pedagogy that includes a belief that children need to feel connected and supported where they are suitably challenged and can demonstrate competence and practice autonomy. This constructivist type approach includes a positive view of children and a belief that they are predisposed to cooperate and learn at developmentally appropriate levels. The more authoritarian environment is focused on controlling student behavior to maximize academic learning opportunities (Watson, 2008) and may be viewed as more efficient by an educator who feels pressured to deliver the academic scores expected by the Ministry of Education.

In the authoritarian environment it is reasonable to expect the approach to teaching moral literacy to parallel the pedagogy of classroom management, which would be more consistent with traditional character education. This approach involves direct teaching: opportunities to practice taught values with rewards and punishments to help guide student behavior in the *right* direction (Watson, 2008). "Whether transmitting values or math skills, the educational processes of telling, modeling, explaining, practice and correction would be the same" (p. 178, Watson, 2008). Pre-service teachers who find themselves in such an environment, even if they subscribe to the developmental discipline and constructivist moral education approach, may find such methods difficult to execute. Conversely, administrators who maintain a more authoritarian perspective will have different expectations of staff and students. Likely, there would be more frequent rules to be obeyed, with punishments and rewards for non/compliance and directed tasks for all to follow. The administrator would be the primary decision maker, following a hierarchical structure of authority and creating a more heteronymous environment for members of the learning community.

According to Vitton and Wasonga (2009) the decision-making of administrators has become increasingly complex, matching the nature of school environments, and yet the preparation of administrators to manage such decisions in ethical or moral ways is limited. Increasing operational matters including policies and protocols have taken precedence. Administrators are responsible for setting the tone or direction of a school community; to ensure this environment is conducive to the advancement of moral literacy and development of moral character in students, supportive structures must be in place.

Pre-service teachers, in my experience as a practicing administrator, often feel they must "fit in" with the school structures, particularly those structures in the classroom of their associate, and are already keenly aware of the pressures of the "achievement agenda." Such dynamics may create inner conflict within a pre-service teacher who finds they must subvert their own instincts in order to operate within a school or classroom environment that doesn't match their pedagogy. It would also seem counterproductive, as the instincts of the pre-service teacher might actually be more conducive to moral literacy development and thus have greater positive impact for character formation of students.

As a school administrator it is my expectation that pre-service teachers share their expertise and knowledge, and become involved by contributing positively to the school culture in general and the classroom culture specifically. In terms of moral literacy development in the form of character education, I expect pre-service teachers to be familiar with the Ministry mandate (know that it exists), and endeavor to

structure lessons and classroom management techniques in ways that are conducive to the development of moral literacy skills. This pre-supposes that they have an understanding or moral literacy and how best to advance it. I do not expect pre-service teachers to simply parrot the style or skills of their associate unless, in their estimation, these practices are in the best interests of our students, academically, socially, and emotionally.

**Implications for Practice and Concluding Remarks**

After identifying the possible flaws in present teacher education practices and acknowledging the challenges of today's classrooms, the questions that remain pertaining to the teaching of character education are: What is the body of knowledge in moral literacy that we desire in pre-service teachers, and how can it be implemented through teacher education programs? We propose that efforts to enhance pre-service students' knowledge of moral development and different theoretical approaches to morality should permeate the pre-service curriculum. This could be accomplished by establishing a moral literacy course in which students would focus on examining different theoretical principles in moral development. In this course, teacher candidates should be able to develop proficiency in understanding children's moral development, to choose which theoretical principles to apply in their teaching practices, and to extend their understanding of character education practices. The class should be structured to allow discussions about different moral issues such as equity, justice, and wellbeing of others, and it should enable examination of various case studies or sharing of personal experiences. Such an approach would give teacher candidates a greater perspective and may help them navigate some of the challenges they will face as practicing educators more successfully.

A strong knowledge base in character formation enhances teaching practices. Pre-service and practicing teachers need to be aware that their teaching practices shape not only students' academic learning, but also their character development. According to Narvaez and Lapsley (2008), character formation begins as a caring relationship first in the family and then extends to school. Caring schools and classrooms prove to be beneficial for students on many levels. When students are cared for and also care about others, they have a better chance to develop democratic citizenry traits; they show social and emotional maturity and consequently show a commitment to mastery learning. Schools who emphasize a strong sense of community experience less discipline problems and bullying, and they report improvements in overall academic performance (Narvaez & Lapsley, 2009; Power & Higgins-Alessandro, 2008). A caring community is an important variable in students' learning. Therefore, pre-service teacher candidates should be taught what a caring community is, as well as what kinds of strategies should be used in building a caring community in their classroom and school. On-going training for practicing educators would also be beneficial in this regard.

According to Noddings (2013), caring is a jointly rewarding relationship between caregivers and cared-for individuals. Noddings proposes four components of character education based on the caring perspective: modeling, dialogue, practice, and confirmation, which we believe should be introduced in a moral literacy course. Each of these components of caring are enacted by the teacher, "the one caring," with the students, "the ones cared for," but are also reciprocal, where students in turn learn to care. Modeling refers to more experienced teachers (pre-service instructors) demonstrating the skills and attitudes that new teachers should be developing, such as "meticulous preparation, lively presentation, critical thinking, appreciative listening, constructive evaluation, [and] genuine curiosity" (p. 503).

Modeling caring should also be expected from the experienced associate teacher working with teacher candidates during placements in schools. It is here where dialogue and practice occur. Where *dialogue* involves treating ideas about "material to be analyzed, discussed, critiqued, and considered" (p. 503), *practice* means that new teachers have opportunities to practice caring in the company of master teachers who are models of caring. Field placements are opportunities for teacher candidates to master the skill of caring. Confirmation calls for community members to understand one another's goals and to support each person's progress toward "the ethical ideals that each strives toward" (p. 505). By modeling, dialogue, and practice, novice teachers will develop a sense for the needs of the wider community and will be able to transfer their sense of care to future students.

Based on this inquiry, the following implications pertaining specifically to practicing educators in public schools have been identified for further consideration. First, to help our youth to develop as morally literate and functional in society requires a re-thinking of how decisions are made, whose voices are heard, and what filter is used to determine what is given priority in schools. Next, youth today need to develop the ability to critically question circumstances presented by society and envision better alternatives (Watts & Guessous, 2006). To do this they must be supported by educators in schools, and greater society through the daily interactions they experience in their classrooms and schools. Youth must see themselves as having worth and power to act responsibly. Third, in present-day education, where what gets measured is what is often focused upon, it seems appropriate that beyond

the changes to day-to-day interactions and a culture/climate of the school setting, what is needed is some form of assessment of moral literacy. Fourth, none of this is possible without educating the educators; pre-service programs and in-service for practicing educators are of paramount importance. Educators need a basic understanding of the principles of moral development theory and a familiarity with research supported practices/outcomes in order to align their classroom practices to develop moral literacy levels, facilitating opportunities for students to develop their thinking skills without telling them what to think. Finally, and by extension, training programs for leaders (future administrators) must also provide some exposure to, and understanding of, moral development theory; the relation to moral literacy; and efficacious means for developing student character at a school level. We believe that understanding the importance of developing autonomy, feelings of belonging, and competence among students is paramount to their socio-moral development.

While there is certainly more emphasis in popular literature and school board mandates on the instruction of the whole child, we are not necessarily supporting our educators to deliver on this promise. We teach our teachers how to deliver a literacy program so that children learn to read and write, and we do not deny the importance of these fundamental skills. We are simply arguing that future teachers need to be taught moral theories and the effective character education implementation to enhance students' sociomoral reasoning necessary for developing the whole child. This approach to educational practice in return will help true transformation in education to be achieved.

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# Flipping the Graduate Qualitative Research Methods Classroom: Did It Lead to Flipped Learning?

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The flipped, or inverted, classroom has gained popularity in a variety of fields and at a variety of educational levels, from K-12 through higher education. This paper describes the author's positive experience flipping a graduate qualitative research methods classroom. After a review of the current literature on flipped classrooms in higher education, the author discusses his reasons for flipping, the steps he took to create the flipped classroom, and the outcomes of the flipped classroom experience. The author evaluates whether flipped learning occurred according to the four pillars of FLIP (FLN, 2014) and discusses suggestions for both future researchers and future classroom flippers.

In spring 2013, I taught Qualitative Research Methods for the ninth time. I faced a class of 10 doctoral students who had already taken a quantitative methods course and were now in their last semester of coursework prior to taking their preliminary exams and working on their dissertation proposals. It did not go well. I spent most of class time lecturing with very little student engagement. This was very different from prior semesters in which students were more engaged in discussion each class meeting. Now, students asked few questions and added no comments to my descriptions of qualitative methods, research designs, and data analytic techniques. Their work on writing a mini-proposal for a qualitative study was average; I received no spectacular pieces and saw very little student interest in conducting or even reading qualitative research in the future. Only two of the ten are completing qualitative dissertations at this time (typically at least half go on to do qualitative dissertations). After reflecting on the semester (which did not take long), I realized a major overhaul was in order. It was time to explore new options for delivering the course in a way that more explicitly engaged students in "doing qualitative research" rather than just hearing about it from me. I had taught the course the nearly the same way for 9 years and was uncomfortable with the small amount of engagement with research and the large amount of lecture I used.

About this same time (late April 2013), I was hearing a lot about the "flipped classroom," but I had no idea what this meant. After a few Internet searches, I knew I wanted to explore this idea in more depth as it appeared to be just what I wanted in all of my classes, not just the Qualitative Research class. The basic idea of moving lecture to out-of-class work and moving traditional homework activities to the in-class setting was very appealing. I wanted to know more about how to do this, how it worked, if it worked, and what students thought of the flipped environment.

Even in the few short years flipped or inverted classrooms have been studied, there is already a fair amount of literature supporting their use in higher education. Some of the studies are more anecdotal in nature, while other authors performed quasi-experimental studies comparing the flipped classroom to a non-flipped classroom. The fields to which flipped classrooms have been applied are as varied as the reports themselves: mathematics, engineering, economics, history, teaching, statistics, pharmacy, and nursing, to name a few. Flipping the classroom has also received international attention, with studies reported from Germany (Braun, Ritter, & Vasko, 2014), Australia (Butt, 2014), and South Africa (Ivala, Thiart, & Gachago 2013) among others. What follows is a descriptive summary of this literature (based in higher education only) divided into four themes: reasons for flipping, the flipping experience, outcomes of flipping, and lessons learned about flipping.

Similar to the present study, Hoffman (2014) flipped her graduate-level qualitative research methods classroom. Her emphasis was on scaffolding the classroom research project as a culminating assessment in the course, implementing $e^3$ design and problem-based learning along the way. This is different from the present study, which focuses more on the flipping the class to enhance content delivery. She reported "positive outcomes and lasting impacts" as a result of the flipped environment (p. 58).

## Reasons for Flipping the Classroom

The primary reason for flipping the classroom found in the literature is to increase student engagement (Critz & Knight, 2013; Findlay-Thompson & Mombourquette, 2014; Gaughan, 2014; Wilson, 2013) by providing students with more active learning experiences (Butt, 2014; Mason, Shuman, & Cook, 2013; Pierce & Fox, 2012; Tune, Sturek, & Basile, 2013). Other instructors had a concern for students' overall experience in the course (Davies, Dean, & Ball, 2013; Enfield, 2013; Lage, Platt, & Treglia, 2000; Missildine, Fountain, Summers, & Gosselin, 2013; Schwartz, 2014; Talbert, 2014). Gaughan (2014) added

achieving increased in-class time with her world history students to this list. Braun, Ritter, and Vasko (2014) were concerned about students' apparent lack of independent study outside of class time. All of these reasons emphasize improving the student experience in the course in some way.

### Instructors' Experience with Flipping

All studies explored in this review used the "simplistic form" (Hoffman, 2014) of flipping the classroom: video lectures and/or reading outside of class covered the main content, and active and collaborative learning experiences dominated the in-class time. More advanced forms of flipping might include moving beyond pre-recorded lecture to actually curate video content from the Internet, engaging students in online discussion, and providing higher-order forms of learning activities that engage students in critical thinking and discussion during class time. For example, Critz and Knight (2013) included pre-recorded PowerPoint lectures and reading assignments for students to complete outside class, followed by a quiz. In class time was spent on case studies into which major topics were woven. Gaughan (2014) used content-based videos and historical readings to prepare students to engage with primary source material in class through small-group and large-group discussions. According to Gaughan, "the online lectures have provided time in the classroom for a proliferation of discussion-based activities that I would not otherwise have been able to do" (p. 228).

### Reported Outcomes of Flipping

In terms of outcomes, studies reported one of two types: either comparisons of the flipped environment to a non-flipped environment or reports of student (and sometimes instructor) satisfaction. Davies, Dean, and Ball (2013) reported comparisons between three information systems classroom environments (traditional, simulation, and flipped) and found the flipped approach to be slightly better (but not statistically so) than the traditional approach, with both approaches superior to a simulation environment. They based their results on a common post-test across all three environments: achievement on this exam was not significantly different. Findlay-Thompson and Mombourquette (2014) did not find any significant grade differences among one flipped and two traditional classrooms of an introductory business course. Similarly, Braun, Ritter, and Vasko (2014) did not find differences in exam performance between semesters taught traditionally and those with flipped content. In contrast, Love, Hodge, Grandgenett, and Swift (2014) found significantly higher test performance for the students in their flipped linear algebra course; Missildine et al. (2013) saw significantly higher final exam performance in their adult health nursing course; and Talley and Scherer (2013) found significantly higher final grades in the flipped section of their physiological psychology course than they saw the year before when they did not flip the course. Thus, the jury is still out on whether flipping the classroom leads to achievement differences, with mixed results reported in the current literature.

Most studies report some measure of student satisfaction with the flipped learning environment (Critz & Knight, 2013; Enfield, 2013; Findlay-Thompson & Mombourquette, 2014; Gaughan, 2014; Hoffman, 2014; Kim, Kim, Khera, & Getman, 2014; Lage, Platt, & Treglia, 2000; Pierce & Fox, 2012; Strayer, 2012; Vaughan, 2014; Wilson, 2013). Students interviewed for Findlay-Thompson and Mombourquette's (2014) study indicated "the flipped classroom allowed them … to do better on assignments" (p. 67) due to the availability of the instructor during class time (as opposed to the instructor just lecturing). Students reported satisfaction with the out-of-class time commitment necessary to watch videos and read (e.g., Critz & Knight, 2013) and felt that the content was relevant (e.g., Enfield, 2013).

### Lessons Learned about Flipping

Lessons learned by current "flippers" are many, with the most predominant being the initial and considerable time investment involved in flipping a classroom (Enfield, 2013), particularly if one is flipping the entire course as opposed to one or two modules (Critz & Knight, 2013). Findlay-Thompson and Mombourquette (2014) encouraged educators to focus on faculty training and student buy-in, both of which they considered essential to the success of the flipped classroom. Kim, Kim, Khera, and Getman (2014) generated nine design principles as a result of their review of three flipped classrooms, found in Table 1.

### Context of the Study

I chose to flip my classroom without the benefit of most of this literature – so much of it came out in 2013 and 2014 when I was constructing the flipped environment. My choice was made primarily on the brief descriptions found on websites, a few articles, and conversations with an educational technology faculty member. Ultimately I made the change because I wanted more time with my students and more time for my students to engage in *doing* qualitative research rather than hearing me talk about it. I also hoped it would liven up a sagging teaching practice with which I had become disenchanted.

Table 1
*Design Principles for Flipped Classrooms*

| Design Principle |
|---|
| Provide an opportunity for students to gain first exposure prior to class |
| Provide an incentive for students to prepare for class |
| Provide a mechanism to assess student understanding |
| Provide clear connections between in-class and out-of-class activities |
| Provide clearly define and well-structured guidance |
| Provide enough time for students to carry out the assignments |
| Provide facilitation for building a learning community |
| Provide prompt/adaptive feedback on individual or group works |
| Provide technologies familiar and easy to access |

*Note*. *(*Kim, Kim, Khera, & Getman, 2014)

The Qualitative Research Methods course I teach is at the graduate level – the semester in which I flipped the course I worked with four master's-level students and fourteen doctoral-level students. The course meets for 5½ hours every other Tuesday during the spring term (January – May). It is an introductory course, so it includes a broad survey of qualitative research methods. This includes discussions of research paradigms, research purposes, qualitative research methods (including data analysis), and four traditions within qualitative research: case study, ethnography, life history, and phenomenology. Students work on a series of smaller exercises that lead to the development of a small-scale study proposal. Students are typically at different points in their programs, though for the majority of the doctoral students this is their last course.

**Flipping the Qualitative Methods Classroom**

I spent all of fall 2013 (September – December) on the mechanics of flipping the classroom. This included time for updating and revising notes, translating notes into PowerPoints, then doing voiceovers using VoiceThread (http://www.voicethread.com) to save the final piece. I also created the classroom activities in which students would engage during this time. All of the course material was organized via modules in our learning management system, Canvas. I did look for pre-existing videos online but did not find any to my liking. Admittedly this was not an earnest search, however, and in the future, I plan to continue seeking out other options for students besides my VoiceThreads. The steps I took for each class session included:

(1) Determining the learning outcomes for the session,
(2) Preparing the course notes for the session's topics,
(3) Preparing PowerPoints for the session's topics,
(4) Converting PowerPoints to VoiceThreads for the session's topics (approximately 7-10 minutes each, with two per class session),
(5) Selecting readings for the session's topics,
(6) Creating small-group and large-group activities for the session,
(7) Creating module in Canvas for the session,
(8) Creating individual work for the session, and
(9) Creating a time grid for the session's flow of work.

The out-of-class time commitment switched from reading and writing in prior years to reading and listening to VoiceThreads in the flipped environment. Although I did not poll students on the exact amount of time spent on out-of-class activities, my assumption was that the 7-10 minute VoiceThreads took considerably less time than the writing assignments they replaced, so that in the flipped environment students spent less time on out-of-class activities than before. The readings were the same as in prior years, so this time commitment did not change. The only change was removing the writing assignments and adding the VoiceThreads.

Challenges that arose while creating the flipped classroom were few. I used simple technology that I was comfortable with, so that was not a concern. In the future, I would like to get more "tech-savvy" with the pre-class videos but for now I am happy with them. Early on I was worried about the loss of "my class" (i.e., my lecture time based on my notes) but soon realized that students were getting the same material (my notes converted to VoiceThread) as before, just in a different environment—and a better one—since they now had the opportunity to stop, pause, and rewind the lecture which they cannot do when it is live.

The other main issue that arose while I engaged in flipping the classroom was a renewed focus on learning outcomes. In particular, as I had to think about what students would be doing with their class time, I had to

think about learning outcomes specific to each class session. I had never really done that before. I had always considered the overall course learning outcomes but never what I wanted students to get out of a particular class meeting. Schwartz (2014) argued for this when he indicated "a key to approaching these [in-class] activities is to begin with the end in mind: what should the students ultimately learn about a particular topic during the class period?" (p. 202). While I did not write these down, these daily learning outcomes better positioned me to create the assessments and activities for each meeting. They also led me to reconsider my overall course outcomes: I added two, deleted one, and revised three as a result of this process of considering individual class meeting outcomes.

**The Flipped Classroom Experience**

In class, we first engaged in discussions about the readings and VoiceThreads, typically lasting 30 – 45 minutes. Then students worked in small groups on an assignment related to that day's topic, followed by some individual writing on the topic. After a dinner break, students engaged in a second small group activity, from which results were reported to the whole class and a discussion ensued. Finally, students worked on individual writing tasks, shared their results with a peer, and then edited their tasks before submitting them to me for comment (see Figure 1).

Challenges that arose during the semester were also few. The first set of VoiceThreads were hard to hear unless the students wore headphones. Otherwise, the VoiceThreads worked well and in an informal assessment of the flipped experience all students reported the VoiceThreads were helpful and a reasonable expectation prior to class (i.e., they were not too long, they helped focus the reading, and they lead to richer class discussion). Two students had issues with the high level of classroom noise while completing individual assessments and felt distracted. This was unexpected. At first I was quite pleased with the noise level because students were talking to each other about their work. But for the next class I will make arrangements for students to bring their headphones to class or move to a different venue while completing the individual assignments if necessary. One student felt rushed to complete the individual assignments, a complaint I did not hear until the end-of-term evaluations. For the next class I will make it clear students can always finish their work at home.

Overall evaluations by students of the flipped classroom were positive (except for the one student who felt rushed). Four students in particular mentioned they wished more classes were structured this way. Students commented that it was nice to have me around to bounce ideas off of instead of listening to a "talking head" for 5½ hours. They also liked having their peers there for support while working through the concepts in class as opposed to on their own: one student said s/he "didn't feel so isolated." End-of-term evaluations came out the same way: students were very positive and supportive of the flipped classroom and would do it again if they had the chance.

**Analysis of Whether Flipped Learning Occurred**

In Spring 2014, while my first flipped classroom was in progress, the Flipped Learning Network (FLN) generated the following formal definition of *flipped learning* and indicated that "flipping a class can, but does not necessarily, lead to Flipped Learning" (FLN, 2014):

> Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (p. 1).

In essence, flipped *learning* takes the flipping experience beyond the mechanics of flipping. It describes the outcomes of flipping in terms of student engagement and learning. Thus it is not enough to go through the mechanical motions of flipping one's classroom: attention must be paid to the outcomes of this flipping. In the following paragraphs I will evaluate, post hoc, whether I engaged my students in flipped learning as a result of flipping the classroom by exploring each of the four pillars and the associated indicators (see the Appendix for a summary of these).

**Flexible Environment**

As part of the flexible learning environment, I definitely believe I established spaces and time frames that allowed students to interact, but I did not explicitly provide time for them to reflect on their learning. By circulating during group and individual work times I continually observed and monitored students. Adjustments were made as necessary. I did not provide students with different ways to learn content: everyone had to read the same material and watch the same VoiceThreads and complete the same assessments. I also did not provide students with different ways to demonstrate mastery: everyone had the same final product required of them.

**Learning Culture**

As a result of flipping, students definitely completed activities without me being central. Whether

Figure 1
*Time grid comparison from 2013 (non-flipped course) to 2014 (flipped course)*

| Time Block | 2013 | 2014 |
|---|---|---|
| 4:15 – 4:30 | Discussion on pre-read article | Discussion of videos/readings using NoteApp |
| 4:30 – 4:45 | | |
| 4:45 – 5:00 | Lecture | |
| 5:00 – 5:15 | | |
| 5:15 – 5:30 | | |
| 5:30 – 5:45 | | Group work on activity related to purposes |
| 5:45 – 6:00 | | |
| 6:00 – 6:15 | | Individual Writing – purpose statements |
| 6:15 – 6:30 | Dinner | Dinner |
| 6:30 – 6:45 | | |
| 6:45 – 7:00 | | |
| 7:00 – 7:15 | Lecture | Group activity on case study design with large group report out |
| 7:15 – 7:30 | | |
| 7:30 – 7:45 | | |
| 7:45 – 8:00 | | |
| 8:00 – 8:15 | | Break |
| 8:15 – 8:30 | Break | Individual writing – Maxwell 2.1 |
| 8:30 – 8:45 | Lecture | |
| 8:45 – 9:00 | | |
| 9:00 – 9:15 | Peer discussions of writing done for homework | Pair share of individual writing with revisions |
| 9:15 – 9:30 | | |
| 9:30 – 9:45 | Final Thoughts | Reflection and Class Evaluations |

or not they were meaningful is more difficult to assess. I believe the activities I have chosen are meaningful, and students generally find them helpful for applying the content, so I would say they completed "meaningful activities" as required by this pillar. Still, I feel the need to revisit the activities to make sure they are achieving their goals. I do not scaffold these activities, however, and I realized early on this was a challenge. After a

general class discussion of the content students move directly into the assessments; there is no time for them to practice the content first. One of the activities I have added for the next class is a whole class discussion in which we practice applying the concepts together before moving into small groups to complete the assessments.

**Intentional Content**

I would definitely say that I prioritized concepts used in direct instruction, and as a result I created relevant VoiceThreads for them to view on their own. I did not differentiate content, however. Everyone viewed the same material and read the same books. In the future, one student characteristic to consider is their prior experience with qualitative research methods. I assume none when I prepare and teach the course, but this is not an assumption I have ever checked. This would let me know how much differentiation is necessary in future classes.

***Professional educator***. One of the best experiences I had flipping the classroom was my ability to be accessible to all students during class time; thus, I did make myself available to all students for individual, small group, and class feedback in real time. Several students commented on this feature of the flipped classroom as one of the best. I did conduct observations during class time, but the data used for future instruction was mostly along the timing aspect: changing what I do when for next year in order to add or modify work done in class. Most of my observations fueled further reflection on class and how I might make it better the next time. I collaborated with a technology expert while developing the course, but outside of that I did not collaborate with other educators. I would say that the entire experience flipping the classroom is evidence that I take responsibility for transforming my practice.

## Discussion

Overall, I consider the flipped classroom experience a success. I was very pleased with the outcome, particularly because the students were pleased with it as well. I have work to do to improve upon last year's success, but that is always the case with teaching. I did not fully achieve flipped learning, however, and some of the work I have to do involves coming closer to a flipped learning environment next year. I need to differentiate and scaffold instruction for sure, and if possible provide alternate means for students to demonstrate mastery of the material.

This study adds to the current literature on flipped classrooms in two ways. First, this is one of the first graduate classroom flips to be reported in the literature. Hoffman's (2014) study was also set in a graduate-level qualitative research methods course. Some have questioned whether flipping is appropriate for all levels of students (e.g., Schwartz, 2014), but this has been primarily at the undergraduate level. The current study provides support for flipping at the graduate level, even in an introductory course.

Second, this is the first time flipped learning (FLN, 2014) has been assessed in a flipped classroom. The literature is still mixed on whether post-secondary students see achievement gains as a result of flipping, but this outcome is not the only one to assess. A more subjective understanding of student learning can be assessed using the FLN's (2014) four pillars as a guide.

**Suggestions for Future "Flippers"**

I offer two important suggestions for future classroom "flippers." First, be prepared for a heavy workload prior to the course. Creating and curating video content, creating the online course elements, preparing for classroom interaction, and preparing assessments all take time, as they do in any course. In a course I am currently teaching, I did not complete all of the "flipping" prior to its start in August. Thus, I have run against time demands to flip classes the week they are held, which gives students little time to prepare. I had more success in the courses I have fully flipped from the outset. This allowed me to focus more on in-class interactions and assessment rather than the technical details of creating the online content. I would encourage faculty to have the entire course flipped prior to it starting (or the entire class session if only flipping part of a course).

Second, based on FLN's (2014) guidelines, flipping is more than creating the environment. Constant attention to individual students and their experience in the flipped environment is essential. In my classroom, some students felt rushed or distracted; I wish I had known this sooner so I could alter the environment for them. I did not differentiate instruction or provide alternate means of assessment for students, and this may have limited the learning that ultimately took place. I would encourage faculty to be prepared to attend to individual students as well as the whole group during class meetings.

**Suggestions for Future Research**

I will first echo Butt's (2014) recommendation that future research explore the attainment of learning outcomes in the flipped environment. Most research, including the present study, has focused on the process of flipping and the satisfaction of faculty and students with the flipped environment. Any new pedagogical technique should be evaluated for the learning outcomes that are achieved as a result of the technique, and flipping the classroom is no exception. In the case of the present study, this was the first time I flipped a

classroom (which I believe is also true for many of the studies reported in the literature), so it seemed valuable to first assess the general success of the flipped environment before getting more specific and evaluating learning outcomes.

I would also encourage future researchers to explore the FLN's (2014) guidelines to provide empirical support for them at the post-secondary level. For example, I question whether differentiation is necessary in an introductory course where no student has had formal exposure to the content before. At the advanced level, however, differentiation becomes key as students enter the course with a variety of content-related experiences and backgrounds.

I also encourage teacher-researchers continue to report their experiences flipping the classroom environment so that others may learn more about this technique. Various researchers in a variety of countries have contributed to the literature, and we need more. Teacher-research, or classroom action research, is essential for the continued evaluation and success of the flipping movement. We need to understand how best to construct the flipped learning environment, how our students experience this environment, how faculty experience this environment, and how achievement is impacted by this environment.

## Conclusion

Flipping the graduate qualitative research methods classroom was a moderate success for me, as it has been for many in higher education. Continued research is necessary in order to understand the learning that actually occurs as a result of this new pedagogical technique, as the research is conflicted on whether any achievement gains result from flipping the classroom. Flipped learning needs to be evaluated in addition to quantitative achievement scores. Students are still the core of the classroom, and ensuring they have a positive, engaged learning experience is at the heart of any instructional technique. Through future research and reflection, I hope other teacher-researchers are able to add to this literature so that we may better understand the process and results of flipping the classroom.

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Appendix
The Four Pillars of F-L-I-P™ (Flipped Learning Network, 2014)

| Pillar | Indicators |
|---|---|
| Flexible Environment | • Spaces and time frames for students to interact and reflect on their learning<br>• Continually observe and monitor students to make adjustments as appropriate<br>• Provide students with different ways to learn content and demonstrate mastery |
| Learning Culture | • Opportunities to engage in meaningful activities without teacher being central<br>• Activities scaffolded and accessible to all students through differentiation and feedback |
| Intentional Content | • Prioritize concepts used in direct instruction for students to access on their own<br>• Relevant content created or curated<br>• Content differentiated so it is accessible and relevant to all students |
| Professional Educator | • Teacher is available to all students for individual, small group and class feedback in real time<br>• Ongoing formative assessments conducted during class time through observation and recording data to inform future instruction<br>• Teacher collaborates and reflects with other educators and takes responsibility for transforming practice |