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“Do we really need this class?”: Former K-12 Teachers Transitioning to Teaching as University Faculty

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Abstract: The focus of many Ph.D. programs in research-intense universities across disciplines is to prepare its graduate students to enter the professoriate with the skills needed to be successful in meeting institutional research expectations. Although most tenure-track positions include teaching responsibilities, few programs prepare faculty for teaching at the post-secondary level. As faculty at a research-intensive university, we developed a pilot course focused on preparing future faculty to develop the knowledge, confidence, and understanding of usefulness of constructs related to teaching in university classrooms. Overall, all ten participants found the course useful and provided feedback that will inform future iterations of the course. Misalignment of course expectations are discussed as are constructs perceived as most helpful to their future teaching.

Keywords: college faculty, graduate education, college teaching, pedagogy.

The focus of many Ph.D. programs in research-intense universities across disciplines is to prepare its graduate students to enter the professoriate with the skills needed to be successful in regard to meeting institutional research expectations. Although teaching and service commitments are commonly part of the expectation as a new assistant professor, these two areas are rarely systematically addressed through coursework nor are graduate students mentored when assigned teaching assistantships. Boden, Borrego and Newswander (2011) claim that “higher education institutions in which graduate students are trained are ill-equipped to facilitate interdisciplinary research, teaching, and other aspects of interdisciplinary graduate training” (p. 742).

Furthermore, only about 26% of Ph.D. students in the United States move into tenured or tenure-track positions and even then, the time to get into these positions can take much longer than Ph.D. candidates expected (Gould, 2015). Many graduates find themselves taking positions in which their primary responsibility is to teach while they seek out tenure-track positions. There are few resources that are available to guide future faculty through the process of transitioning from teaching at K-12 setting to the university classroom. Although many Ph.D. students in colleges of education may have experience teaching in K-12 settings, there is an adjustment in terms of pedagogy, student issues, and university expectations and oversight that needs to be taken into consideration. Furthermore, working with university colleagues presents its own sets of challenges and opportunities

different from K-12 settings. For faculty from culturally and linguistically diverse backgrounds, the challenges can be even greater (Hernandez, Murakami-Ramho, & Rodriguez, 2015).

Ecological Model

Our study is broadly framed under sociocultural theory, which asserts that learning is an inherently social activity (Rogoff, 1990; Vygotsky, 1978). Briefly described, sociocultural processes center on socially-mediated understandings and rely on interactive and situated learning to push development forward (Driscoll & Driscoll, 2005). Herein, the instructor's role is to engage learners and their learning partners in socially-organized practices relevant to their culture. The learner then interacts with social environment (inclusive of the instructor, peers, and artefacts) with the end goal of more culturally-appropriate thinking abilities, skilled use of cultural tools, and greater awareness of one's own thinking. Given this, sociocultural practices of college teaching become widespread and efficacious only with support from the broad learning environment on the grounds that these practices fulfill the academy's recurring and time-sensitive cultural and social needs (Katz, 2010).

As an analytic and theoretical tool to deconstruct the socio-cultural components of college teaching, we borrow from Bronfenbrenner's (1979) Ecological Systems Theory. Sociocultural learning is supported by the interrelationship(s) among different social, cultural, legal, political, and economic institutions, as well as the influential practices and protocols that develop around them. As such, the ecological systems framework presents the concrete analytic needed to outline this interrelationship of various contexts. From there, grounding research within this framework helps to disentangle the impact of multiple interactions occurring on and through specific systems as one develops socioculturally.

Bronfenbrenner (1979) delineated various systems (microsystem, mesosystem, exosystem, the macrosystem, and the chronosystem) of influence. To understand the complex, mutually shaping influences across interrelated environments in this analysis, we streamline the interacting systems to include only the microsystem, mesosystem and macrosystem. Described concisely, the microsystem concerns the environment, of direct contact, closest to the individual, while the mesosystem involves the interconnections across different parts of a person's microsystem. The macrosystem, which evolves slowly over time, subsumes all other levels and concerns the larger impact of the environment or community, its underlying cultural norms, political context, and economic arrangements.

The ecological levels interact to influence a mature progression from the inside out. For example, choosing the university as the microsystem, students socialize to the art and science of teaching through strengthening their core values and developing a discipline-specific identity, while establishing relevant practices specific to internal structures. This then allows them to advance to the next level (mesosystem) where they must perform appropriately with various colleagues, administrators, and departments across their university microsystem. With adequate interpersonal skills, students can then move on to the macrosystem level to enact change on a larger societal or cross-institutional scale.

Related Research

There is a gap in the literature and professional trade books in training education faculty and all future faculty for teaching at the university level. One identified text addresses general teaching practices for all faculty (e.g., Svinicki & McKeachie, 2014); however, it is less appropriate for future faculty with a teaching background. Within our own college, many of our doctoral students have

experience in the K-12 school system while others enter our Ph.D. program with no classroom experience. Education faculty, in particular, need to learn how to balance teaching time with research time and service time (which is different from K-12 teaching) as well as developing teaching skills/experiences in higher education contexts with diverse student populations and unique challenges. Students and new faculty members may be currently receiving an unintended message (personal communication with student in program on September 15, 2016) that teaching is less important than other responsibilities of faculty members.

If graduate students are being socialized into a culture in which teaching should be prioritized behind research and service, this poses a challenge to preparing graduate students for their future roles in the university classroom during a time when their time and energy is already limited. In order to shift the culture, institutions need to have faculty who are exceptionally passionate about the topic in question (Boden et al., 2011), teaching in our context. Graduate students and professors established in their academic careers have commented on the lack of attention to their development as educators. Austin and McDaniels (2006) found that graduate students and criticisms of their training generated five recommendations, one of them being the need for developmentally-oriented teaching opportunities.

Socialization of graduate students into higher education, the discipline of education in our case, is a useful and commonly used framework for understanding graduate students experiences (Golde, 1998). Socialization, as it applies to graduate students, has been defined by Weidman, Twale and Stein (2001, p. iii) as “the processes through which individuals gain the knowledge, skills, and values necessary for successful entry into a professional career requiring an advanced level of specialized knowledge and skills.” According to Golde (1998), it spans from moving from a novice to a full-fledged member of a professional community. Furthermore, Tierney (1997) argues that an organization’s culture “teaches people how to behave, what to hope for, and what it means to succeed or fail” (p. 5).

Scholars proposed various stages involved in doctoral student socialization to future faculty (Austin & McDaniels, 2006; Braxton & Baird, 2001; Gardner, 2007; Golde, 1998; Lovitts, 2001; Sweitzer, 2009). Research on doctoral education indicates that the doctoral student university experience is the first stage of socialization to the faculty career (Austin, 2002; Austin & McDaniels, 2006). At the university microsystem, students begin their new program by learning the language of a particular discipline, building a new identity, and entering into the discourse, or ways of being (Gee, 2012), of the academy. The development of relationships with peers and faculty within the mesosystem is particularly important to the socialization stages (Sweitzer, 2009). Austin (2002) also found that at the macrosystem level, adjusting to the changing broader societal expectations of the academy is also a necessary stage for traditional and nontraditional faculty.

Microsystem: Socialization to Disciplinary Structures of the University

From the first year in a graduate program, students’ experiences provide important lessons for how they should perform as researchers, educators, and citizens within their institutional communities (Neumann, 2009). Scholarship on the acclimation of future faculty to the university microsystem focuses on identity development (Austin & McDaniels, 2006; Sweitzer, 2009), professional development programming (Austin, 2002; Kondakci & Haser, 2012), as well as the changing structural nature of interdisciplinarity (Gardner et al., 2014; Holley, 2010).

For identity development, Austin and McDaniels (2006) propose that preparations for future professoriate include specific abilities, knowledge, appreciations, and skills related to academia. Proper knowledge acquisition can build a sense of professional identity, when doctoral

students learn the discipline-specific language as well as the history, defining issues, and the belief systems of the field. A second core component in identity development calls for the investment of self in the form of time, energy and money. Lastly, is the need for involvement, where commitment actualizes through participation in scholarly activities such as professional conferences, college teaching assistantships, and research projects. Sweitzer (2009) asserts that these experiences socialize doctoral students to adopt certain professional roles and inquiry practices available within the university structure to approach the broad disciplinary issues. Viewed in this way, socialization occurs through a great range of experiences which influence a trajectory that is neither linear nor stable, but instead dynamic and varied.

Also stressed in the literature is the importance of professional development programming for socialization. Within these formal and structured programs, future faculty learn rules and expectations of the workplace (Kondakci & Haser, 2012). Noting the scarcity of developmentally appropriate professional development, Austin (2002) underscores the need for systematic guidance on faculty tasks, such as advising, building a curriculum, committee work, navigating ethical dilemmas, and community outreach. Other professional development programs for future faculty involve teaching certification programs and competitive grant writing workshops (Vanderbilt Center for Teaching, 2017, <https://cft.vanderbilt.edu/>). Also needed is an understanding of how academic works for tenure-track faculty, inclusive of faculty governance hierarchies, the influence of administration, as well as the relative weight of teaching, research and service (Tierney & Bensimon, 1996).

As the disciplinary nature of academia changes, future faculty must adjust to interdisciplinary perspectives and approaches (Gardner et al., 2014; Holley, 2010). Given socialization frameworks have mostly focused on traditional conception of disciplines as siloes, new models are needed for gauging experiences within the increasing number of interdisciplinary doctoral programs. At first, interdisciplinarity can be viewed as a paradox within historical and popular conceptions dominating higher education (Holley, 2010). Doctoral programs have long existed with the sole purpose of producing scholars with an extensive depth of expert knowledge within their discipline. While disciplines should not necessarily be seen as monolithic entities bereft of diverse scholarship (Donald, 2002; Lattuca, 2001; Toma, 1997), working and thinking within specific knowledge field aligns future faculty within a specific disciplinary community of practice (Lave & Wenger, 1991). However, interdisciplinary programs expect future faculty to work and research across multiple communities of practice. Additionally, doctoral students must understand how to integrate knowledge when addressing research problems. Given the challenge when balancing a depth of disciplinary knowledge within the breadth of interdisciplinary approaches (Holley, 2010), socialization processes must overcome institutional barriers to collaborative space, departmental engagement, and research paradigm politics (Bogden et al., 2011).

Mesosystem: Mentoring/ networking Models of Socialization

The primary means by which graduate students are being socialized is through their interactions with professors and other students (Lovitts, 2001). Most studies address the impact of these developmental interactions through mentoring (Cawyer, Simonds, & Davis, 2002; Schrodtt, Cawyer & Sanders, 2003), social capital (Niehaus & O'Meara, 2015), or social network analysis (Baker & Lattuca, 2010; Pifer & Baker, 2013; Rawlings & McFarland, 2011).

Briefly defined, mentoring, as a form of socialization, acts as a communicative relationship wherein a senior scholar supports the career development of a junior faculty (Schrodtt et al., 2003). A future faculty's ability to adjust to life in academia is predicated upon the bidirectional strength between the newcomer's network of colleagues and the colleagues' willingness to mentor (Cawyer et

al., 2002). This back-and-forth interpersonal connection can allow for formal and informal opportunities to practice professional identity and perform certain roles in appropriate ways. In this supportive capacity, tenured faculty professionally coach and psychosocially validate the junior faculty through acts of friendship and acceptance (Cawyer et al., 2002). Mentors are particularly important when they can navigate the junior faculty through the murky and stressful waters of the tenure process (Alexander, 1992; Cawyer et al., 2002; Tierney & Bensimon, 1996). However, practical challenges exist that may lessen the influential power of mentorships in academia. Because of the nature of academia's high work load, faculty mentors are often unavailable or inconsistent (Cawyer et al., 2002). To combat this tendency, Cawyer et al. (2002) argue against simply encouraging informal mentoring to suggest well-developed programs with formal assigning of mentors.

Understanding interpersonal bonds as a form of social capital, Niehaus and O'Meara (2015) research the role of on *and* off-campus professional networks for future faculty. According to Bourdieu (1986), social capital highlights the role of an individual's social networks, group membership, connections and/or supportive relations that lend power through information, influence, and allies. Seen this way, the social capital gleaned from others can emerge and permeate from individuals or from larger communities. Social power can often increase the professional agency of a junior faculty, when they leverage strategic perspectives or actions that propel them forward professionally (O'Meara, Campbell, & Terosky, 2011). Challenges of relying on social capital for career advancement is that supportive networks take time to develop and the resultant social power evolves slowly (Niehaus & O'Meara, 2015).

Social network analysis calls attention to the complex connections occurring between doctoral students' networks and their learning experiences, career advancement, and professional identity development (Baker & Lattuca, 2010; Pifer & Baker, 2013; Rawlings & McFarland, 2011). Social network approach is beneficial in that it provides a structural framework for exploring the role of multiple relationships as well as tracing the flow influence (Baker & Lattuca, 2010; Rawlings & McFarland, 2011). Likewise, all networks are viewed within the mentoring role. This relationship constellation yields a variety of long-term benefits, such as retention, professional development, and identity formation (Dobrow & Higgins, 2005; Higgins, 2000; Higgins & Thomas, 2001; Sweitzer 2008), and short-term boosts, including greater career satisfaction and stronger intentions to persist towards tenure (Baugh & Scandura, 1999; Higgins, 2000; Higgins & Thomas, 2001; van Emmerik, 2004). Studies show that strategic awareness and internal power relations (between genders and authority positions) often dictate the functional patterns emerging from the networked flow of influence (Rawlings & McFarland, 2011).

Macrosystem: Future Faculty Socialization as a Cultural Process

Due to increasing numbers of culturally and linguistically diverse faculty entering academia, the literature indicates the pressing need to frame faculty socialization as a cultural process (Bogler, & Kremer-Hayon, 1999; Jayakumar et al., 2009; Johnson, 2001; Rhoads, & Valadez, 2016; Tierney & Rhoads, 1994). Amid this acclimation to broader societal values, other higher education literature foregrounds the pressure to internalize culturally imposed gender norms (Lester, 2008). However, the recent literature casts a compelling claim that socialization can be framed as bidirectional process--meaning that as newcomers learn what is expected of them, they can also exercise the power to enact, discard, and/or reshape problematic organizational and professional norms (Sule, 2014). In this way, socialization as a cultural process can be managed for future empowerment (Tierney & Rhoads, 1994).

Due to the difficulty in understanding and then navigating the particular culture of their host institution (Johnson, 2001; Tierney & Rhoads, 1994), faculty members' beginning years are often the

most stressful. Scholars believe that successful adjustment within the final stages of socialization reflects a deep engagement/internalization to the cultural configurations junior faculty search out and find (Trowler & Knight, 1999). However, the effort required to align with the cultural norms, expectations, and needs of their new organizations, is not equal across all junior faculty. According to Sule (2014), academic socialization originates from and reproduces a legacy of race and gender exclusion. Frequently, traditional professional development fails to sufficiently address how minority faculty negotiate institutional norms when defining their professorial role. Rhodes, Ochoa and Ortiz (2012) propose that culturally and linguistically diverse (CLD) doctoral students have particular developmental needs. Though not necessarily linear or prescriptive, socialization as a cultural process may require the following phases: *Honeymoon Phase* – exhilaration, hopefulness; *Culture Shock Phase* – confusion, discouragement; *Adjustment Phase* – understanding of new culture, acceptance of differences; balancing and blending native and new; and *Acceptance Phase* – identification with new culture.

Additionally, organizational discourses and social practices extend beyond race and ethnicity to also perpetuate gender appropriate roles for men and women (Lester, 2008). From their study of promotion and tenure practices, Tierney and Bensimon (1996) discovered that women faculty feel pressured to enact “mom” and “smile” work, perform a caring and nurturing role, extinguish conflict, while also avoiding confrontation. Further, women are expected to participate in service activities at higher rates than their male counterparts in order to perform the “glue work” of the academic department and maintain universities functioning (Eveline, 2004; Lester, 2008; Tierney & Bensimon, 1996). Women also report the unstated obligation to reinforce gender stereotypes by advising a disproportionate share of students and fulfill the “emotional work” needed amongst students and colleagues (Acker & Feuerverger, 1996; Bird, Litt, & Wang, 2004; Knights & Richards, 2003; Tierney & Bensimon, 1996). While female faculty understand this work as essential and advantageous for institutional culture, they do not assume it beneficial for their career advancement (Knights & Richards; Lester, 2008). Not conforming to the expected behavior for their sex or gender, LGBT faculty face added stress when navigating heteronormative privilege (Dozier, 2012). Oftentimes, LGBT faculty report their social validity denied through invisibility, misrecognition, and discrimination.

Context and Purpose

To fill needed gaps in the literature, we used sociocultural and ecological systems theory to enact, through practice, recommendations for developmentally-oriented teaching. At our institution in the U.S. Southwest, we were invited to design and implement an elective course within the college of education aimed at preparing future faculty to teach in a university setting. Through our planful actions, we sought to uncover the necessary pedagogical structures to be built and/or improved. Currently, the Graduate School in our University offers support to future faculty through Preparing Future Faculty (PFF) and according to its website, it is recognized nationally for its professional development program for doctoral students, MFA students and postdocs who intend to pursue a faculty position. Admission to the PFF two-semester, one credit per semester course is limited in enrollment (currently 56). Teaching is addressed as one of the roles of becoming a future faculty member. However, it is stated clearly on the website that although teaching is covered, it is only one part of the agenda. Typically in the PFF, only one of 12 sessions focuses on teaching.

Our efforts were not necessarily to duplicate this program, but to surpass it in breadth and depth through a more sociocultural application of college teaching across interacting ecological systems. The purpose of this research project was to study individual's perceptions of and the

processes related to learning to teach at the university/college level. With a group of third year doctoral students, this study addressed the following questions: 1) *How do participants perceive their knowledge, confidence, and usefulness of constructs around teaching at the post-secondary level?* 2) *What aspects of a pilot course do students find most and least helpful in their preparation to teach at the post-secondary level?*

Methods

To answer our research questions, we employed an exploratory mixed methodology design (Creswell & Clark, 2007) with data collected from four sources. From this multi-faceted approach, we felt we could more effectively uncover the complex learning experiences taking place across interacting ecological systems. As discussed by Creswell and Clark (2007), an exploratory mixed methods design sequentially builds upon an initial phase of mostly qualitative data analysis through the subsequent collection and analysis of quantitative data. In our follow-up quantitative phase, then, we explored potential change in personal development from pre-to-posttest. We leveraged these quantitative scores to ground our preliminary qualitative findings and construct a more complete understanding of broad relationships between students and their university microsystem as well as patterns across learning ecologies. Hence, through this mixing of research methods, no form of qualitative or quantitative data were given more precedence or weight, as the integration of their analysis could serve both research questions and enhance the overall findings.

Participants

The participants in this study were third year doctoral students at a university in the Southwestern USA participating in the first year of this study and at the onset of their preparation to teach at the post-secondary level. Participant demographics included female ($n=7$) and male ($n=3$) graduate students who identified as having ethnic backgrounds as Caucasian ($n=8$), Latino/a ($n=1$), and South Korean ($n=1$). Four graduate students indicated that they had no K-12 teaching experience, while the other students reported years of teaching experience at the K-6 level as one to 20 years ($M=4.1$, $SD=6.5$) and at the 7-12 level as two to ten years ($M=3.6$, $SD=3.6$).

Instruments

Methods of data collection bring their own flaws/biases to the research (Maxwell, 2012), and though not intended to confirm findings, triangulating student feedback data against quantitative pretest-posttest scores helped to counterbalance, cross-check, and broaden our mixed methods data set.

Qualitative Data Sources

Data were collected through three qualitative sources: (a) four formal semi-structured interviews (spread out across the academic year), each lasting 20-40 minutes (with one participant only completing three interviews); (b) class observations with field notes and (c) document analysis of completed course assignments, in-class presentations, and other materials (e.g., guest presenters notes and handouts) etc. During the interviews, graduate students were asked to self-rate their preparedness to teach at the post-secondary level, using a scale of 1 not at all prepared to 10 extremely prepared. Interviews were recorded and later transcribed verbatim.

Quantitative Pre/Post Surveys

The fourth data source was a quantitative pre and post survey based on the Bronfenbrenner Ecological Systems (1977) along with the Knowledge-Confidence-Usefulness instrument (KCU) first used by Barton-Arwood, Morrow, Lane, and Jolivet (2005) and more recently used by Lane et al. (2015). The topics covered in the course were identified from the content covered in the two employed textbooks (Gray & Drew, 2012; Svinicki & McKeachie, 2014) and a course reading (Bain, 2004) to track perceptions related to their knowledge, confidence; and the usefulness of the experiences designed to help prepare them for teaching at the higher education level. There were 24 topics identified that were covered in the course based on the course developed from the two aforementioned textbooks including: (a) use of eportfolios; (b) understanding university culture; (c) meeting a class for the first time; (d) understanding academic rank; (e) models of best teaching; (f) teaching styles; (g) coteaching; (h) working with Academic Associations and Teaching Assistants; (i) technology and social media in teaching; (j) online teaching; (k) student engagement and motivation; (l) learning styles and cognition; (m) physical activity breaks/movement differentiation in the classroom; (n) preventing and addressing faculty and student issues; (o) issues of cultural difference; (p) FERPA issues; (q) dealing with controversial topics; (r) balancing research, teaching and service; (s) active learning; (t) balancing work and home life; (u) being a good citizen, (v) negotiating teaching loads and responsibilities; (w) transferring skills; and (x) ethics in higher education. Each of the aforementioned topics had three questions addressing: (1) knowledge, (2) confidence, and (3) usefulness of the perception items (i.e., 24 x 3 or 72 items). The instrument had a scale ranging from zero to three. The instrument design and use of these three questions on each topic were based on the KCU instrument first developed by Barton-Arwood et al. (2005). For each course topic, graduate students were asked the same questions for each of the three outcome areas (knowledge, confidence, and usefulness). For example, “please rate your knowledge using the criteria below: Knowledge: 0 - I have no knowledge of this concept or strategy. 1 - I have some knowledge of this concept. 2 - I have more than average knowledge of this concept or strategy. 3 - I have a substantial amount of knowledge of this concept or strategy.”

Data Analysis

Qualitative data sources were analyzed using constant comparison and analytic induction methods to identify and extract common themes across participants and data sources during the year (LeCompte & Preissle, 1993). In a preliminary sense-making data reduction strategy, the researchers borrowed from the current literature on ecological understandings of doctoral socialization to future faculty to code along the following principles: interdependence, feedback, cycling of resources, and adaptation (Wielkiewicz & Stelzner, 2005). In addition to these process-oriented themes, the researchers generated a separate coding scheme to map the three levels of interacting systems across our adaptation of Bronfenbrenner’s ecological theory. Several techniques were used to support the trustworthiness of the data, including data triangulation, peer review, member checking, and a search for negative cases.

Descriptive statistics were used to analyze all of the survey data (means, standard deviation, frequencies). Summative variables were created for the 3 outcome areas of knowledge, confidence and useful for the pre and post results from graduate students. Internal Consistency Reliability analyses were performed across all perception items (e.g., 72) for the pretest and for the posttest.

Results/Discussion

This mixed methods study allowed for the multi-faceted examination of the effectiveness of a pilot course in positively impacting doctoral students' developmental socialization to future faculty. Our group of graduate students, with the majority having been K-12 teachers, had high self-ratings of their current abilities to teach at the post-secondary level ranging from 6-8 with 10 being extremely confident [with one student who did not self-rate]. The results related to graduate students' post-secondary teaching perceptions included the themes of being confident, having the potential to be effective at the post-secondary level, and a mismatch between expectations and course design. These themes along with salient course topics are discussed below.

First, graduate students discussed their confidence as post-secondary teachers. Ester stated, for example, "I don't really foresee any problems with it. I like teaching. I generally have a very good rapport with students and I think as long as I'm teaching some kind of content that I know enough about, I'll be fine." Second, graduate students also talked about their potential to be effective post-secondary teachers, Bill mentioned "...I think I have all the basic building blocks in place, but from being a teacher I know that there's no substitute for experience. I feel confident that I can get up to a 9 or a 10, but it's going to take some time of course, just actually being in the trenches and doing the work...there's always more to learn."

The final major theme that emerged from the qualitative data sources was a mismatch between expectations of the course and what was accomplished by the end of the semester. Interview data and field notes revealed that students had expected to know what specific course they would be teaching the following semester early in the course. Consequently, they assumed that most of the class would be devoted to developing their own course syllabus reviewing and/or developing their own course readings and assignments. As course designers, that was never our intended goal. Scheduling issues did not allow for assignment of courses to doctoral students as instructors until very late in the semester. One of the course assignments required that the graduate students shadow an instructor/professor in a course they would be interested in teaching. Nine of ten students expressed that it would have been helpful to know what course they would be teaching in order to determine which instructor/professor to shadow.

Addressing the second research question (from interviews, field notes and document analyses), the course assignment identified as most useful was developing a teaching philosophy statement. In interview 4, after their semester of teaching and one semester after initially writing their philosophy statement, eight of the ten participants stated that their basic philosophies had not changed and that having had time to reflect on their teaching philosophy had made them more effective instructors. Regarding what students found the least helpful in the pilot course, seven of the ten participants did not find the course readings helpful nor useful and strongly suggested that we eliminate the course texts. This was most strongly expressed by those participants who had substantial teaching experience. In addition, although the participants generally stated that they had benefitted from the guest speakers, they expressed frustration at the limited time that was devoted to opportunities to interact with one another in order to share and discuss course topics and completed assignments. They also felt that they had not had adequate time to interact with us as seasoned professors with substantial teaching experience.

Internal Consistency Reliabilities for the perceptions items were $\alpha=.93$ and $.95$ for the pre and post survey items, respectively. Descriptive statistic results suggested that graduate students' perceptions of the knowledge, confidence and usefulness of the topics covered in the course were quite positive. For the pre survey, they rated 64% of the items with a 2 or 3 (or better than average or highly for knowledge, confidence and useful). This number increased overall for the posttest to 86%. The topic five items across all three areas were all related to usefulness and included: (a) Negotiating

Teaching Loads and Responsibilities, (b) Preventing and Addressing Faculty and Student Issues, (c) Student Engagement and Motivation, (d) Understanding University Culture, and (e) Ethics in Higher Education.

This ecological pattern of student learning and development can be illustrated through the emergent process model of Chi and colleagues (2012). In this model, the three components are the pattern level of overall perceived dynamics (macro level), the individuated university agents/students within the socialization process (micro level), and the social subgroups into which the agent/student network (meso level). Defining characteristics of the emergent process are that the interactions of the entire collection of academic actors (e.g., students, faculty, and administrators) cause the pattern, all interactions serving local goals and have equal status within the pattern, students can behave in nonmatching or disjointed ways, and the pattern emerges from the collective summing of local interactions at each point in time (Chi et al., 2012). Though all individual action is goal-oriented and coordinated via implicit cues and subtle signals, unique patterns of self-organizing behaviors emerge without blueprint or intention. Similar to this emergent process model, many of the doctoral students could not predict how their individual actions and interactions would impact the larger pattern of activity on the macro level. Yet, when they could practice leadership at higher levels, they developed greater awareness and purpose regarding their individual actions, which in turn increased through sheer stimulation of interactivity. Mixed methods inferences can be developed which posit that it is the high interactivity and emergent co-construction of leadership practices across an ecology of socialization that leads to the highest growth and sense of efficacy among individual doctoral students.

Conclusions

To summarize, all data sources provide evidence that doctoral students preparing to teach at the post-secondary level can benefit from a course focused on teaching. Their preparation in a research-intensive doctoral program should include an opportunity to develop as course instructors, given that most tenure-track positions in education include teaching responsibilities that are evaluated as part of progression towards tenure. The results of this study have implications for theory, research, and doctoral education.

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Enhancing the Emotional Intelligence of Students: Helping the Critical Few

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Abstract: Research has shown that students' emotional intelligence (EI) can be enhanced with time intensive instructional method, nevertheless some studies are inconclusive. This study looked at the impact of including short EI lessons in an introductory hospitality management class. Results showed that students who started with low EI increased their scores significantly; however, those with medium and high EI did not. More intensive EI lessons may be needed for those who started with higher levels of EI. Scholarship of Teaching and Learning (SoTL) reflections were used and the results of the current study were also compared to other similar studies to identify EI teaching methods among faculty in other disciplines. Recommendations are included for those who want to incorporate EI lessons into their classes to enhance students' emotional and social competencies.

Keywords: teaching emotional intelligence (EI), emotional and social competencies (ESC), teaching reflections.

Introduction

Imagine two different scenarios: one, in the middle of the semester; a student “Mike” approached the instructor after class explaining he forgot to do the assignment that was due that day and wanted an extension. The instructor’s policy was to not accept late assignments, so an explanation was provided to the student that an extension on his assignment could not be granted since that would not be fair to the other students. Mike became very angry and threw his textbook at the wall and walked out of the classroom. A few remaining students were upset, asked the instructor if she was okay, and she assured them she was fine. It was no surprise that before the end of the semester, the instructor heard from other students that Mike had got in a bar fight and broke some bones in his hand. Mike had some anger management issues and lacked impulse control, which was a bad combination.

The second incident transpired at the end of the semester. About two weeks before the scheduled final exam “John” e-mailed his instructor to say that he would not be taking the final exam. He further explained that his Father was dying of cancer and he wanted to go home to spend as much time as he could with his Father. The instructor responded to John’s e-mail with sympathy and offered to let him take the exam early due to his circumstances. John replied with, “I know that I will earn a C in the class if I do not take the exam (he had an A at the time) and I am okay with that; I am trying to prioritize my time to get things done and get home as soon as possible”. The instructor agreed that family was a priority and supported his decision.

How could two students be on opposite ends the spectrum in terms of professionalism and composure? One student was poised and the other experienced an emotional hijack (Goleman, 1995). After attending a conference presentation on the emotional intelligence of managers the author began to realize the value and importance of teaching students and future managers about emotional intelligence (EI) and how to improve it. This study is a reflection of that journey.

Researchers have touted the benefits of including EI in higher education (Vandervoort, 2006). Various investigators have analyzed the teaching and learning of students’ EI in business

programs (Clark, Callister & Wallace, 2003; Groves, McEnrue, & Shen, 2008; Joyner & Mann, 2011; Kruml & Yockey, 2011; Houghton, Wu, Godwin, Neck & Manz, 2012), psychology classes (Chang, 2006; Nelis Quoidbach, Mikolajczak, & Hansenne, 2009), and hospitality management classes (Scott-Halsell, Shumate & Blum, 2007; Rivera & Lee, 2016). The studies utilized various educational techniques to improve students' EI. However, interpreting and comparing the results proved very difficult due to different EI measures and dissimilar reporting of results. Nevertheless, for the most part, past studies showed that students who received EI-related lessons increased their EI. Therefore, the purpose of this study was two-fold: 1) to evaluate whether or not short EI lessons benefitted students in an introductory hospitality management course and 2) compare some of the various teaching methods and outcomes from other studies.

What is EI?

Thorndike (1920) alluded to social intelligence and defined it as the “ability to understand and manage people” (Thorndike & Stein, 1937, p. 275). Much later, Gardner (1983) described the multiple intelligences model, including intrapersonal and interpersonal intelligences, which are analogous to emotional and social intelligence. Salovey & Mayer (1990) described emotional intelligence as a subset of social intelligence. The most commonly cited definition of EI includes the appraisal, expression, and regulation of emotion in oneself and others along with the use of emotions to guide one's thoughts and actions (Zeidner, Roberts, & Matthews, 2002). Researchers do not always agree on the definition (Cherniss, 2010) and sometimes they debate the validity of EI (McEnrue & Groves, 2006). Some of the argument stems from the difference between EI and emotional and social competencies (ESC). EI denotes the ability to recognize and regulate emotions; whereas, ESC refers more to the performance or aptitude of EI (Cherniss, 2010); however, most of the literature use EI when referring to either EI or ESC. While the concept of EI has been debated, the current research tends to show the benefits of EI and it is “motivating educators and managers to take emotional issues seriously” (Zeidner et al., 2002, p. 229). A meta-analysis of EI research demonstrated that future research involving EI is worthwhile as it is a valuable predictor of performance (Van Rooy & Viswesvaran, 2004). And, several studies have shown a link between EI or ESC and work performance (Cherniss, 2010). Researchers have noted that EI can be developed yet more research is needed, especially with adult populations (McEnrue & Groves, 2006).

There are several EI measurement tools; however, there are four main models often cited: Bar-On's EQ-i (1997); Mayer, Salovey, and Caruso (MSCEIT; 2002); Boyatzis and Goleman ECI (Boyatzis, Goleman & Rhee, 2000); and the Trait Emotional Intelligence Questionnaire (TEIQue: Petrides, 2009) (Cherniss, 2010). Researchers have compared the various models and instruments (Van Rooy & Viswesvaran, 2004; Peña-Sarrionandia, Mikolajczak & Gross, 2015) and they suggested that the models complement one another, yet the various instruments measure slightly different aspects of emotional intelligence (Chang, 2006; Peña-Sarrionandia, et al., 2015).

According to Bar-On (2006) his EQ-i model includes “emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands” (p. 14). The instrument has been proven valid among college students (Dawda & Hart, 2000) and has corrective factors for the self-report measure, including a consistency index, along with Positive and Negative Impressions scales (Bar-On, 1997; Bar-On, 2006). Researchers have linked the Bar-On EQ-i results with managers' work performance (Salski & Cartwright, 2002; Langhorn, 2004); therefore, increasing their EI could benefit college students in their current and future places of employment. The Bar-On EQ-i (1997) has 133 questions to encompass the model that has 5 realms with 15 sub-scales: Intrapersonal (Emotional Self-Awareness, Assertiveness, Independence, Self-Regard, and Self-

Actualization), Interpersonal (Empathy, Social Responsibility, and Interpersonal Relationships), Adaptability (Problem-Solving, Flexibility, and Reality Testing), Stress Management (Stress Tolerance and Impulse Control), and General Mood (Optimism and Happiness). In summary, the Bar-On EQ-i model (2006) considers emotional and social competent people as those who can manage others and manage change by being realistic and flexible, solving problems and making decisions to successfully deal with various situations.

Review of EI teaching methods

Transformative learning is a method by which instructors can “learn” or increase their understanding of teaching and learning; reflections in this area can focus on content (what), process (how), and premise (why) (Kreber, 2006). Previous EI studies incorporated a variety of disciplines and included many variations in research design, teaching methods and data analysis. Some researchers used time intensive and in-depth EI lessons. One example provided an illustration of teaching EI to graduate students by utilizing EI-related readings, case studies, and content as an integral part of the course (Jaeger, 2003). Similarly, Chang (2006) made EI a major component of an undergraduate psychology course and included several hours of class time and one-on-one sessions between the instructors and students. Likewise, Groves, McEnrue and Shen (2008) utilized an intensive 11 week training program including a self-assessment, self-development plan, readings, coaching, journal entries and one-on-one sessions with the instructor. All three studies compared the treatment and control groups’ changes in EI scores.

Another study incorporated EI lectures into management classes and had students keep a journal on their feelings and behaviors throughout the semester (Houghton, et al., 2012), unlike the previously mentioned studies they reported results in a qualitative manner. A different approach was taken by Sheehan, McDonald, and Spence (2009) in that they incorporated experiential experience into a course and asked students to keep a reflective journal. Their methods included a post-test only design; however, they collected quantitative and qualitative data from students in an experimental and a control group. Both types of data showed the experiential education had a positive impact on emotional competency development in students.

Nelis, et al., (2009) also used a control group and showed that a very small training group ($n = 19$) had significant increases in EI after 10 hours of EI lessons. Pool and Qualter (2012) utilized a larger sample of undergraduate students with a treatment ($n=62$) and control group ($n=32$) and devoted about 22 hours of class time to EI lessons. Joyner and Mann (2011) stated that they incorporated EI lessons into a three year MBA program; however, it was not specified how much time was spent on EI development.

Others, such as Scott-Halsell, Shumate, and Blum (2007), used two hours of instruction, in a hospitality human resource management class. Kruml & Yockey (2011) included a one hour lecture and a one hour one-on-one feedback session between the instructor and student to review the students’ Bar-On EQ-i pre-test results, but they did not focus on teaching EI to MBA students throughout the rest of the course. Whereas, one study utilized students’ EI pre- and post-test scores to compare them by major (Nursing, Physical Therapy and Health Science); results showed differences by major which differed in the style and delivery of content (Larin, Benson, Wessel, Martin & Ploeg, 2014).

On the contrary, some studies measured the changes in students’ EI over a semester without covering EI concepts. One study notes faculty taught management and leadership skills to undergraduate business students, which positively affected their EI post-test scores (Clark, et al., 2003) and another study reports faculty covered diversity issues in a hospitality management class resulting in a decline in EI scores (Rivera & Lee, 2016). Whereas, other researchers found a

significant difference in changes by gender over a semester, even though EI concepts were not covered in first-year experience courses (Leedy & Smith, 2012). Other researchers, who did not cover EI concepts in class, compared first year business students by major (e.g., Accounting, Business, Culinary Arts, Information Technology, and Sports and Recreation management) to show there were differences among the student groups (Yarrish & Law, 2009).

Based on the past research, a hypothesis was developed:

H1 – EI lessons will improve students' EI.

The research also showed sometimes there were differences by demographic groups, such as gender (Joyner & Mann, 2011; Leedy & Smith, 2012) or major (Yarrish & Law, 2009), and by the beginning level of the students' EI (Kruml & Yockey, 2011).

Therefore, more hypotheses were developed:

H2 – There will be differences in EI development by demographics (gender and major).

H3 – There will be differences in EI development based on the students' EI level.

To engage in the Scholarship of Teaching and Learning (SoTL) includes a systematic review and reflection of teaching and learning research along with personal experience (Kreber & Cranton, 2000; McKinney, 2013). Therefore, the purpose for the second part of this study was to compare some of the EI teaching methods and outcomes among a variety of disciplines with my students' experience. As noted by Kreber (2006), one SoTL question is to identify "best practices" in other words, which methods enhance student learning. While there are many EI models and several measurement tools, this study focused on research that utilized the Bar-On EQ-i (1997) model to demonstrate the variations in methods and results. The disparity in research methods and reporting complicates comparisons among different models, let alone one measure. However, the value of comparing and contrasting the studies can enhance our SoTL of EI.

Methods and Course Design

A passion for the concept of emotional intelligence, led this researcher to embark on an adventure to assess whether students could improve their EI. This paper includes reflections of teaching EI to students in an introductory hospitality management class over the past several years. This project used a pre-test, intervention, and post-test model to assess students' EI, since EI is linked with managers' success.

The Bar-On EQ-i (1997) was utilized for the pre and post-test measures. The EQ-i instrument has been proven valid and reliable among a variety of populations (Bar-On, 2006). Researchers have reported the reliability of the scale among college students with an overall Cronbach's α of .96 and the subscales ranged from .69 to .94 (Dawda & Hart, 2000) and it has been utilized by many faculty in past research. The pre-test was administered in an introductory undergraduate hospitality management course at the beginning of the semester. EI lessons were incorporated into the class sessions after the students took the pre-test (see Figure 1). The EI lessons were short in nature, usually around 10 minutes; the same 5 lessons were used for several years. Each year in September, the first lesson started with information about the definition of EI and some of the research demonstrating the potential value of EI in the workplace (Stein & Book, 2000). The post-test was administered at the end of the semester (December), approximately three months after the pre-test.

Table 1. The five EI Lessons utilized (Adapted from Hughes, Patterson, & Terrell, 2005)

Lesson	Activity
1 – Self Regard	Students listed three of their most proud accomplishments; then, volunteers were sought to share with the whole class. This was followed by a discussion about being able to tell people your strengths and weaknesses, especially in an interview.
2 – Impulse Control & Stress Tolerance	Pictures of peoples' faces were projected, students described possible emotions the people might be feeling, along with discussions of emotionally charged scenarios from hospitality management work experiences. Then in small groups, students discussed what stressful activities they encountered and techniques they utilized to reduce stress.
3 – Self-Awareness	Instructor purposely tried to induce stress (see Appendix for details), to prompt discussion about <i>Self-Awareness</i> and recognizing the symptoms of stress.
4 - Interpersonal skills (including Empathy)	Students listed the qualities of the best and worst managers, coworkers, or classmates. This was followed by a discussion on the aspects that demonstrate empathy and learning to read body language. For instance, a guest service agent can gather a lot of information by assessing the guests' moods and interacting with them accordingly.
5 – Adaptability (including Problem-Solving, Flexibility and Reality Testing) and General Mood (including Optimism and Happiness)	Students were asked for examples of when they or a manager demonstrated Adaptability, such as handling a crisis or solving a guest's problem. The session ended with information about ways to increase optimism, by viewing set-backs as temporary and being focused on solutions (not problems).

After one semester of data collection, the pre and post-test scores were compared and there was no improvement in the students' EI scores (see Table 1). However, the same teaching methods were utilized the following Fall semester. The results for year two showed no significant increase in the students' EI score again. The same format EI pre-test, utilizing the same lessons and post-test were continued; yet, the data analysis on a class-by-class basis was discontinued.

After five consecutive years of data collection all the data were combined. The introductory hospitality class was only taught in the fall semester each year, at the same time and day each year, by the same instructor with the same methods and textbook, during a 16 week semester. The class met two days a week, in a face-to-face format, consisting of lectures, activities, discussion, guest speakers, assignments and exams. The majority of students in the class were freshmen (23.2%) or sophomores (36.9%). The average age of the students was 20.39 years old (2.54 SD). Over the five years, more than 400 students took the introductory hospitality management course, over 80% of the students took at least one assessment (pre or post-test). When the scores were matched by student for the pre and post-test there were 241 students who completed both assessments. There were no statistical differences in demographics of the students by year of the class (Major $\chi^2 = 3.6434$, $df = 4$, $p = .0458$; Gender $\chi^2 = 8.130$, $df = 4$, $p = .087$; Classification $\chi^2 = 9.912$, $df = 12$, $p = .624$). The Total EQ-i for the pre- and post-tests were compared by year to test for significant differences (see Table 1). There were no statistically significant differences in the total EQ-i among

years 1-5, in the pre-test ($F=1.839$, $df=4$, $p=0.122$) or the post-test ($F=2.230$, $df=4$, $p=0.066$). The same teaching methods were used each year; thus, the data for all five years was combined.

Table 2. Total EI scores by year

Year	# in class n	matched pairs n	Total EQ-i Means	
			Post-test	Pre-test
1	89	49	92.86 (13.12)	92.86 (12.88)
2	76	43	100.56 (13.38)	98.93 (11.03)
3	86	47	96.11 (11.90)	96.68 (11.28)
4	79	54	95.15 (11.78)	94.35 (11.55)
5	85	48	96.17 (12.94)	95.94 (11.06)
Total	415	241		

After data were combined, paired t-tests were conducted to compare pre and post-test EI scores by major (hospitality and non-hospitality students), gender, and classification, as well as comparing the scores by groups of low (those with EI 90 and below), medium (EI = 91-100), and high (EI = 101 and above) baselines. The low EQ-i group showed a significant increase from the pre- to post-test; therefore, analyses were conducted on all 5 EI realms for the low, medium and high groups. Lastly, paired t-tests were conducted for the whole sample on all 5 realms and 15 subcategories, so that comparisons could be made with other research studies.

Results

There was no significant difference in the overall EI between the pre and post-tests (see Table 2). About half of the students were hospitality majors, while the other half consisted of students from other majors (e.g. Sports/Turf Grass Management, Business Administration, Retail Merchandising, and Interior Design) who were taking the class. There were no significant differences by major ($t = 1.076$, $df = 239$, $p=0.283$), gender ($t = -1.804$, $df = 217$, $p = 0.073$) or classification ($F=1.370$, $df=3$, $p=.253$). Therefore, Hypotheses 1 and 2 were rejected.

Table 3. Paired t-test of scores before and after receiving EI lessons in an introductory course

	Means (SD)		df	t	p	Diff (SD)
	Post-test	Pre-test				
All students						
Total EQ-i (n=241)	96.04 (12.74)	95.63 (11.68)	240	0.834	0.405	0.41 (7.49)
Major						
Hospitality (n= 123)	96.80 (12.00)	96.36 (11.28)	122	0.620	0.536	0.45 (8.00)
Non-hospitality (n=118)	95.24(13.47)	94.88(12.08)	117	0.555	0.580	0.36 (6.96)
Gender						
Male	94.35 (13.96)	93.79 (12.53)	67	0.527	0.600	0.56 (8.74)

(n=68)						
Female (n=151)	96.86(12.40)	96.58(11.32)	150	0.471	0.638	0.28 (7.25)
Classification						
Freshman (n=56)	96.73 (11.62)	96.23 (11.15)	55	.500	.619	.50 (7.48)
Sophomore (n=89)	94.40 (11.86)	94.87 (11.58)	88	-.591	.556	-.46 (7.36)
Junior (n=54)	96.74 (14.09)	96.78 (12.20)	53	-.034	.973	-.04 (8.02)
Senior (n=32)	93.75 (12.32)	91.94 (10.70)	31	1.530	.136	1.81 (6.70)
EI Groups						
Low * (n=74)	83.50 (9.51)	81.58 (6.79)	73	2.308	0.024	1.92 (7.15)
Medium (n=80)	96.26 (8.30)	96.23 (2.82)	80	0.044	0.965	0.04 (7.65)
High (n=87)	106.49 (8.18)	107.05 (5.71)	86	-0.685	0.495	-0.55 (7.51)

*p < 0.05

When the Total EQ-i of the pre-test group was segmented by low, medium and high scorers, the paired t-tests showed a significant increase among those beginning with lower EI. When comparisons were made between the low, medium and high scorers across the five (Intrapersonal, Interpersonal, Stress Management, Adaptability and General Mood) realms of EI, there were significant increases in the Intrapersonal and Adaptability realms for the low scorers and a significant decrease in the medium scorers in the realm of General Mood (See Table 3). The overall EQ-i and two of the five realms of EI significantly increased for the low EI group. Thus, Hypotheses 3 was supported.

Table 4. Paired t-test of scores by low, medium and high EI groups

	Means (SD)		t	p	Diff (SD)
	Post-test	Pre-test			
<i>Total EQ-i</i>					
Low *(n=74)	83.50 (9.51)	81.58 (6.76)	2.308	.024	1.92 (7.15)
Medium (n=80)	96.26 (8.30)	96.23 (2.82)	0.044	.965	0.04 (7.65)
High (n=87)	106.49 (8.18)	107.05 (5.71)	-0.685	.495	-0.55 (7.51)
<i>Intrapersonal</i>					
Low *	82.24 (11.60)	80.38 (9.19)	2.001	.049	1.87 (8.02)
Medium	97.18 (8.95)	96.89 (6.46)	0.313	.755	0.29 (8.22)
High	107.16 (8.51)	107.76 (7.36)	-0.726	.470	-0.60 (7.68)
<i>Interpersonal</i>					
Low	89.85 (12.71)	89.59 (12.22)	0.241	.810	0.26 (9.17)
Medium	100.06 (10.15)	99.98 (8.03)	0.092	.927	0.88 (8.49)
High*	107.85 (9.57)	109.43 (7.41)	-1.880	.063	-1.58 (7.81)
<i>Stress Management</i>					
Low	91.07 (9.44)	89.61 (9.62)	1.489	.141	1.46 (8.43)
Medium	98.00 (10.37)	97.33 (8.79)	0.689	.493	0.68 (8.76)

High	104.08 (9.49)	103.34 (9.30)	0.738	.463	0.74 (9.30)
<i>Adaptability</i>					
Low *	85.35 (8.88)	82.86 (8.16)	2.884	.005	2.49 (7.42)
Medium	93.04 (9.04)	91.80 (6.74)	1.481	.142	1.24 (7.50)
High	102.20 (9.93)	102.22 (8.69)	-0.023	.981	-0.02 (9.18)
<i>General Mood</i>					
Low	89.97 (10.04)	89.27 (9.47)	0.864	.391	0.70 (7.00)
Medium*	100.01 (8.53)	102.89 (6.35)	-2.016	.047	-1.88 (8.37)
High	108.67 (7.55)	108.91 (6.56)	-0.317	.752	-0.24 (7.11)

* p < .05

When paired t-tests were used on the whole sample (n=241) and all 15 categories of the Bar-On EQ-i assessment, there were some significant differences between the pre- and post-test scores in Emotional Self-Awareness, Stress Tolerance, Adaptability, Problem Solving, and Happiness (see Table 4). Lastly, a table was made to compare the mean differences across studies that utilized the Bar-On EQ-i assessment with a pre and post-test design (Table 5). The summary shows the difference between pre- and post-test scores of eleven other research studies that utilized the Bar-On EQ-i assessment. The number of participants in the other studies ranged from 17-97.

Table 5. Paired T-tests of the Bar-On EQi 5 realms and 15 sub-categories (n=241)

	Means (SD)		t	p	Diff (SD)
	Post test	Pre test			
Total EQ-i	96.04 (12.74)	95.63 (11.68)	0.83	.405	0.40 (7.49)
Intrapersonal	96.20 (14.04)	95.74 (13.58)	0.88	.381	0.45 (8.00)
<i>Self-Regard</i>	98.77 (13.10)	99.22 (13.67)	-0.79	.431	-0.45 (8.82)
<i>Emotional Self-Awareness*</i>	100.54 (13.86)	98.98 (13.61)	2.55	.011	1.56 (9.51)
<i>Assertiveness</i>	97.85 (13.50)	97.03 (13.09)	1.23	.220	0.75 (9.49)
<i>Independence</i>	90.99 (13.12)	90.51 (13.82)	0.80	.423	0.48 (9.22)
<i>Self-Actualization</i>	97.13 (14.06)	97.56 (13.57)	-0.66	.510	-0.44 (10.26)
Interpersonal	99.74 (13.04)	100.20 (12.32)	-0.84	.400	-0.46 (8.48)
<i>Empathy</i>	98.64 (13.45)	98.20 (14.24)	0.63	.529	0.44 (10.83)
<i>Social Responsibility</i>	96.19 (12.82)	96.29 (12.66)	-0.16	.874	-0.10 (9.33)
<i>Interpersonal Relationships</i>	102.98 (13.18)	103.76 (12.62)	-1.37	.171	-0.78 (8.82)
Stress Management	98.07 (11.09)	97.13 (10.77)	1.65	.100	0.94 (8.83)
<i>Stress Tolerance**</i>	96.59 (12.10)	95.08 (12.43)	2.59	.010	1.51 (9.06)
<i>Impulse Control</i>	99.73 (11.81)	99.68 (12.32)	0.09	.928	0.06 (10.01)
Adaptability*	93.98 (11.59)	92.80 (11.19)	2.26	.025	1.19 (8.16)
<i>Reality Testing</i>	95.36 (12.37)	94.43 (11.32)	1.56	.121	0.93 (9.22)

<i>Flexibility</i>	97.07 (13.108)	97.19 (13.59)	-0.19	.846	-0.12 (9.94)
<i>Problem Solving**</i>	92.63 (12.06)	90.49 (12.24)	3.10	.002	2.14 (10.72)
General Mood	100.38 (11.55)	100.88 (11.06)	-1.02	.308	-0.50 (7.56)
<i>Optimism</i>	95.38 (12.20)	94.71 (12.05)	1.11	.267	0.67 (9.39)
<i>Happiness**</i>	104.65 (11.56)	106.15 (11.09)	-2.78	.006	-1.47 (8.17)

* p < .05, ** p < .01

Table 6. Comparison of Bar-On EQi pre- and post-test differences

Difference between post & pre tests	Slaski & Cartwright (2003) ^a n=56	Fletcher et al. (2009) n=17
Total EQ-i	5.2***	3.9 (7.4)
Time on Task (EI lessons)	4 days	28 hours
# of significant differences	1/1	Not reported
Sample Population	Retail managers in UK	Medical students in UK
Time between pre and post-test	6 months	7.5 months

*p < .05, ** p < .01, *** p < .001

^a Calculated by hand (not reported in the publication/study)

Table 6. (continued) Comparison of Bar-On EQi pre- and post-test differences

Difference between post & pre tests	Jaeger (2003) n=31	Chang (2006) n = 79	Muyia & Kacirek (2009) n=43	Leedy & Smith (2012) ^b n=97	Nafukho et. al. (2016) n=38
Total EQ-i	9.90 (12.18)***		1.05	n.s.	4.66 (12.30)*
Intrapersonal	9.58 (12.02)	6.05 (10.23)***	-1.37	n.s.	4.40 (12.56)*
Interpersonal	6.77 (11.34)	2.05 (10.74)	-0.84	n.s.	5.61 (12.99)**
Stress Management	8.16 (9.95)	2.60 (9.14)	1.33	n.s.	3.61 (12.06)
Adaptability	8.03 (12.16)	6.54 (11.37)***	-2.09	n.s.	5.50 (13.72)*
General Mood	6.55 (10.44)	3.49 (11.54)*	1.44	n.s.	5.53 (15.00)*
Time on Task (EI lessons)	Not reported	16 weeks	9 days	None	5 days

# of significant differences	1 reported	3/5	0/6	0/6	5/6
Sample Population	Public Admin graduate students in US	Undergraduate Psychology class in US	Leadership training program provided by College of Business - Exec Educ	College Freshman	NGO leaders from 30 countries
Time between pre and post-test	Not reported	16 weeks	1 year	1 semester	1 year

A negative score indicates the pre-test score was higher.

*p < .05, ** p < .01, *** p < .001

^b Pre-test scores reported, but not post-test scores

Table 6. (continued) Comparison of Bar-On EQi pre- and post-test differences

Difference between post & pre tests	Jonker (2009) n=20	Kruml & Yockey (2011) n = 78	Joyner & Mann (2011) ^a n = 55	Dippenar &Schapp (2017) ^a n=30	Current study n =241
Total EQ-i	5.60 (9.40)	4.72(8.23)***	5.1***	6.57*	0.40 (7.49)
Intrapersonal	3.40 (9.60)		4.7***	4.27*	0.45 (8.00)
<i>Self-Regard</i>	2.60 (6.70)	3.42 (7.50)***	2.2	1.30*	-0.45 (8.82)
<i>Emotional Self Awareness</i>	5.40 (13.80)	4.80 (10.10)***	5.4***	4.67	1.56 (9.51)**
<i>Assertiveness</i>	0.60 (12.30)	4.08 (9.81)***	5.9***	4.27	0.75 (9.49)
<i>Independence</i>	0.80 (9.50)	3.46 (10.66)**	2.1	2.47	0.48 (9.22)
<i>Self-Actualization</i>	3.05 (10.70)	4.15 (8.36)***	2.9*	3.40	-0.44 (10.26)
Interpersonal	4.85 (10.40)		4.2***	6.14	-0.46 (8.48)
<i>Empathy</i>	5.60 (10.70)	6.76 (10.27)***	3.9*	5.90	0.44 (10.83)
<i>Social Responsibility</i>	1.80 (10.02)	4.05 (10.30)***	2.9*	5.70	-0.10 (9.33)
<i>Interpersonal Relationships</i>	4.20 (10.50)	4.03 (9.35)***	4.0***	4.90	-0.78 (8.82)
Stress Management	2.50 (11.00)		3.9**	5.74	0.94 (8.83)
<i>Stress Tolerance</i>	4.60 (9.30)	3.37 (9.97)**	3.1*	3.00	1.51 (9.06)**

<i>Impulse Control</i>	0.05 (12.11)	-0.62 (9.45)	3.3*	6.76	0.06 (10.01)
<i>Adaptability</i>	8.50 (7.20)		5.6***	1.14	1.19 (8.16)*
<i>Reality Testing</i>	8.05 (6.20)	4.10 (8.15)***	4.7***	2.46	0.93 (9.22)
<i>Flexibility</i>	4.20 (10.50)	3.32 (10.16)**	4.0**	4.00	-0.12 (9.94)
<i>Problem Solving</i>	7.20 (8.20)	1.54 (10.83)	4.8***	3.77	2.14 (10.72)**
<i>General Mood</i>	4.20 (9.90)		3.3**	3.67	-0.50 (7.56)
<i>Optimism</i>	8.00 (11.30)	3.86 (8.22)***	3.4**	3.60	0.67 (9.39)
<i>Happiness</i>	0.55 (11.05)	3.36 (6.55)***	2.6*	3.10	-1.47 (8.17)**
Time on Task (EI lessons)	5 days	2 hrs	Interspersed through 45 credit degree (3 yr) program	9 lessons (one-on-one coaching)	1 hr
# of significant differences	Not reported	14/16	19/21	6/21	5/21
Sample Population	Future accountants	MBA students in US	MBA students in US	Financial services leaders in South Africa	Undergraduate Hospitality management class in US
Time between pre & post-test	10 days	2 groups = 16 weeks 2 groups = 7 weeks	33 months	9-12 months	12 weeks

A negative score indicates the pre-test score was higher.

* $p < .05$, ** $p < .01$, *** $p < .001$

^a Calculated by hand (not reported in the publication/study)

EI research is an important topic to many fields of study ranging from medicine to business to psychology. However, the study of EI in several subject areas has led to different reporting methods. Many different research projects studying the scholarship of teaching and learning related to EI have published results in a variety of ways; therefore it is difficult to compare the results from one teaching example to another. Nonetheless, the table is a summary of some previous studies compared to the outcomes of this study, resulting in a comparison of 12 studies focusing on developing EI in individuals. Overall, six of the ten studies that reported changes in the Total EQ-i from the pre to post-test scores with a significant increase (Slaski & Cartwright, 2003; Jaeger, 2003; Nafukho et al., 2016; Kruml & Yockey, 2011; Joyner & Mann, 2011; Dippenaar & Schapp, 2017) and eight of the ten studies showed a significant increase in one or more EI scores (in addition to the aforementioned, Chang, 2006 and the current study). Two studies show no significant difference between the pre and post-test EI scores (Muyia & Kacirek, 2009; Leedy & Smith, 2012) and two others did not compare the pre and post-test scores (Fletcher et al., 2009; Jonker, 2009).

Only some researchers reported the amount of time and types of teaching techniques that were utilized. Two studies reported only the difference for the Total EQ-i score (Slaski & Cartwright, 2003; Fletcher, Leadbetter, Curran, & O'Sullivan, 2009), five authors reported the differences among the 5 EI realm scores (Jaeger, 2003; Chang, 2006; Muyia & Kacirek, 2009; Leedy & Smith, 2012; Nafukho, Muyia, Farnia, Kacirek, & Lynham, 2016) and four other studies not including the current study reported EI scores for the 15 subcategories, but three of those reported the 5 realms with the 15 subcategories (Jonker, 2009; Joyner & Mann, 2011) and the other did not (Kruml & Yockey, 2011). Of the five studies reporting the 5 EI realms, only three reported the Total EQ-i of the pre and post-test along with the five realms of EI. Two studies reported merely the pre- and post-test scores, while most of the others reported the mean differences and standard deviations between the pre and post-test scores and one study only reported the pre-test scores (Leedy & Smith, 2012). Beyond the differences in what results were reported, there were also a variety of statistical analyses employed. For instance, Jaeger (2003) only reported the statistics for comparing the Total EQ-i of the treatment group for the pre and post-test ($t(30) = 4.257, p < .001$), the remaining analyses were comparing the treatment ($n=31$) and control group ($n=119$). Fletcher et al. (2009) only reported the results comparing the treatment and control group. The populations that participated in the past research were diverse; several studies included graduate students, while two studies used undergraduate students (Chang, 2006; Leedy & Smith, 2012) and other studies involved managers or accountants (Slaski & Cartwright, 2003; Jonker, 2009). Some researchers administered the post-test at the end of the treatment (Jaeger, 2003; Chang, 2006; Kruml & Yockey, 2011) and others waited one year after the treatment (Muyia & Kacirek, 2009; Nafukho et al., 2016). The detail of the teaching methods also varied by study; some researchers noted using case studies (Jaeger, 2003; Chang, 2006) and role plays (Chang, 2006; Slaski & Cartwright, 2003). Interestingly, Jaeger (2003) noted using Goleman's book and the Bar-On EQ-i assessment. Other teaching tools included group projects, lectures, student diaries, self-development plans, class discussions, one-on-one coaching, and activities (Jaeger, 2003; Chang, 2006; Slaski & Cartwright, 2003; Joyner & Mann, 2011; Nafukho et al., 2016; Dippenaar & Schapp, 2017). Time on task varied in the studies from no time spent on teaching EI to over 40 hours spent on enhancing student learning of EI. Increases in EI do not appear to be related to time on task.

Discussion & Conclusions

Five short lessons (e.g., 10 minutes) were used during the course of a semester to see if students' EI scores would increase. The students who started with low EI significantly increased their EI scores, showing EI lessons can be incorporated into a hospitality management class with success. When all

participants were combined, 21 categories were analyzed and four areas showed an improvement in scores. This increase could be a reflection of the EI lessons, because these EI areas were specifically covered during class. On the other hand, changes in students' EI might be due to other factors revolving around work, family or other classes. Nevertheless, it took several years of teaching and reflection before the true value of my SoTL experience was realized.

Results from this study showed no difference in EI development by major or gender, which differs from some past studies (Joyner & Mann, 2011; Leedy & Smith, 2012; Yarrish & Law, 2009). However, when the students were divided into groups by their beginning EI levels, there were significant increases in a few EI areas for those beginning with low EI, but no increases for those with high EI. Similarly, Kruml and Yockey (2011) found those with high EI did not show a significant increase in their EI scores. The results of both studies may indicate those who start with low EI can benefit the most with a short amount of time on task. Whereas, those with high EI may need to delve deeper into their own development; however, they likely benefitted from seeing how to assist others improve their EI.

SoTL practices can assist with our understanding of how students learn and reflection can be used to find ways to enhance student learning (Kreber, 2006). Comparison of educational techniques used by other faculty showed the method that MBA faculty used to teach EI to students included introducing the concepts to students during one course, ranging from 7 week to 16 weeks and varying by delivery methods from face-to-face and online (Kruml & Yockey, 2011) to integrating the EI competencies into an entire three-year MBA program (Joyner & Mann, 2011). Psychology faculty used more in-depth lessons and control groups to measure whether or not students could increase their EI (Chang, 2006; Nelis, et al., 2009).

The results from this study showed some significant differences in a few categories with short EI lessons incorporated into an undergraduate class; whereas, the two studies of MBA students showed increases in almost all the EI realms and sub-categories. Chang (2006) found a significant increase in a few EI realms with time-intensive lessons included in an undergraduate psychology class. Therefore, EI lessons may need to be tailored to the population (undergraduates, graduate students, non-students and/or managers, low or high EI) to increase the participants' learning. Similarly, Larin, et al., (2014) recommended intentional EI lessons might be needed to show significant improvements. Faculty could incorporate EI lessons into a course through a variety of methods; however, it seems prudent that the topic somehow be related to the course.

As is typical in SoTL research, past studies tended to have a smaller sample size; consequently, there were limitations on the statistical analyses that could be performed. Researchers have varied greatly in terms of what outcomes were reported; these differences made it challenging to compare results and draw conclusions across studies. It would vastly improve the ability of researchers to evaluate the effectiveness of EI lessons if all researchers were more consistent in reporting results.

SoTL research should not just be about finding significant differences. The first few years of this study were filled with hope and optimism of teaching EI; yet, the statistical results were not significant. However, after a few more years of data collection enough samples were collected to conduct statistical analyses by EI baseline group (low, medium, and high) and reveal that some students were enhancing their EI. Therefore, SoTL researchers should not be discouraged by the statistical outcomes.

Reflections on teaching practices helps develop knowledge, as well as assess whether students were learning. Through early analysis it appeared students were not enhancing their EI; however, with further analyses, when students were grouped by low-medium-high EI, there were some significant improvements in the low EI group. As a result, the author has started a new technique in upper-level class to incorporate individualized lesson plans where students do self-

assessments and a reflective journal. More SoTL research on EI can encourage others to try new techniques and share results that we can all build upon.

SoTL includes a review of instructional, pedagogical and curricular elements (Kreber & Cranton, 2000); therefore, SoTL can assist with assessment, program review and accreditation efforts (McKinney, 2013). Similarly, EI assessments could be used to measure student learning and included with assessment reports. Recommendations for faculty who want to teach EI or ESC in the future include: 1) decide the purpose of teaching EI or ESC and set some goals; 2) determine which model best fits with the purpose of the class; then choose an assessment to be utilized; and, 3) finally, develop lessons plans to meet the learning outcomes or course objectives. After teaching and assessing student learning, faculty should reflect upon the course and make improvements to EI lessons and activities.

There were some limitations to my study, it is not known if all the students were present during all of the EI lessons in the introductory course. Also, the research took place with one faculty member. Future studies could see if other faculty and programs could produce similar results with short EI lessons. More research is needed to assess the best techniques for teaching EI and if faculty EI affects student learning.

Appendix

Appendix 1. Sample EI lesson: Stress Management (includes subcategories of Stress Tolerance and Impulse Control)

The instructor walked into class and greeted the students, followed by an announcement that they needed to turn in their assignment from last week. In actuality, there was no assignment due; the announcement was made to induce stress. Some students reacted with outbursts of “What?” and “No”, other students were very quiet, visibly concerned, and perplexed. The instructor announced there was no assignment due, showed an anatomical picture of a human body and asked, “where do you feel the stress? Is your breathing or heartrate faster?” This was followed by a discussion on what physiological symptoms of stress were incurred (e.g., tension, perspiration, or rapid pulse). Then, students were asked to list healthy methods of coping with stress, such as exercise, listening to music, or talking with friends.

Finally, there was a discussion on the value of delaying impulses or outbursts when stressed by a surprise announcement. The instructor also told the story about the marshmallow test conducted by Walter Mischel at Stanford (Stein & Book, 2000). Essentially Mischel found that the young children who were able to delay gratification of eating the marshmallow scored significantly higher on SAT tests taken many years later. For more information see:

<http://www.cnn.com/2014/12/22/us/marshmallow-test/index.html>

For other EI sample lessons, see Brown (2003).

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Designing Flipped-Classrooms to be Taught with Limited Resources: Impact on Students' Attitudes and Learning

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Abstract: Flipped-classes in higher education are becoming increasingly widespread due to the appeal of replacing passive lectures with active-learning communities of inquiry. This mixed methods research study follows the efforts of a professor who had limited resources as she incorporated the flipped-class design in her introductory accounting class. Class designs (lecture vs flipped-class) were compared using the community of inquiry survey, satisfaction survey, opened-ended comments, and students' final exam scores. The study found the flipped-class design had a significant impact on students' attitudes with higher levels of community of inquiry (CoI) ($p = .002$), teaching presence (TP) ($p = .002$), social presence (SP) ($p = .002$), and improved satisfaction levels (SAT) ($p = .003$). Open-ended comments resulted in more positive comments in the flipped class design compared to the traditional lecture format (90% vs 37%). The higher levels of CoI predicted students' SAT score (65.4%). The study found no significant changes in students' learning as measured by their final exam or perceptions of cognitive presence (CP).

Keywords: Flipped-class, community of inquiry, course design, accounting

Introduction

Teaching introductory accounting courses can be a challenge because students enrolled have a difficult time making connections to course concepts due to their lack of relevant work experience. The majority of students taking introductory accounting courses are not accounting majors, but are taking the course to fulfill a program requirement. Thus, many students find introductory accounting courses difficult and boring (Matherly & Burney, 2013). Most disciplines have a similar problem in that students are required to complete a difficult, quantitatively-laden course early during their freshman or sophomore years (Amato, 2013). In an effort to make an introductory accounting course more engaging to students, this faculty member redesigned her class to incorporate more active learning with a flipped-class format (Gilboy, Heinerichs, Pazzaglia, 2015; Mladenovic, 2010).

This mixed methods research study compares an instructor's efforts to redesign her introductory accounting class from a traditional lecture to the flipped-class design format. The class was first taught using a traditional lecture format, during which most of the class was presented by lecture and interspersed with application. These classes were taught in a traditional, fixed-seat auditorium style classroom. Students could read the chapter before class, but most students waited until attending the lecture before reading the chapter and completing homework problems. There were no video recordings, so if students missed class, they missed the lecture.

The instructor then redesigned her class to the flipped-class format. The instructor had no other options for classroom; therefore, the flipped course continued to be taught in a traditional fixed-seat auditorium. To create pre-class videos, the instructor used Camtasia to add audio narration to her

PowerPoint slides. Students were expected to have watched the recordings before coming to class. There was a short quiz over the material at the start of each class. There were 16 quizzes given and only the 12 highest scores counted toward each student's final grade, counting for 10% of the grade. Most students completed their entry quizzes on their cell phones, so students were not required to purchase a laptop computer. Class time was spent predominately on application of accounting problems. Students also used their cell phones to respond to polling questions; therefore, the students did not have the additional expense of a clicker device. The instructor opted to use the free version of Poll Everywhere, so students were not hampered with the cost of purchasing a Poll Everywhere plan. This research study shows it is possible to design a flipped-class that can be taught using limited resources. This study is significant because it shows that the flipped-class format is viable for other instructors working in institutions with restricted funds or student expenditure concerns.

Literature Review

Flipped-Class

Higher education instructors are beginning to redesign their classes using the flipped-class design in an effort to replace passive lectures with a “dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter” (Flipped Learning Network, 2014, p. 1). The flipped-class is defined as pedagogical methods that move the majority of information-transmission lectures out of class; replacing in-class lectures with learning activities where students work as a community of inquiry to solve problems, and require students to complete before and after class assignments to be prepared to complete the in-class activities (Abeysekera & Dawson, 2015). The 2014 NMC Horizon Report identified flipped-classes as one of the top six technology trends in higher education expected to achieve widespread adoption within the next two years (Johnson, Adams Becker, Estrada, & Freeman, 2014).

Flipped-classes are created on a learning culture that moves away from instructor-centered lecture to a learner-centered environment where students are working as a community of inquiry (CoI) (Flipped Learning Network, 2014). Flipped classes are grounded on the principles of the social constructivism theory that suggest students learn better by working actively and interacting with others (Vygotsky, 1978); therefore, students are required to work as groups to complete problems and assume more responsibility of their learning (Huffman, 2016).

Resources to Teach Flipped Classes

Flipped classes require students to engage in work outside class using online resources to watch pre-recorded video lectures to allow students the opportunity to engage in active and collaborative learning during class. To encourage collaborative learning, some colleges and universities are moving away from the traditional, lecture-style auditorium classrooms that make interaction difficult due to the fixed seats. While there is no single flipped-class architecture, many of these new classrooms incorporate similar features. Most rooms are equipped with similar furniture consisting of round tables that seat 6-8 students with movable chairs. These rooms are usually equipped with electronic devices such as multiple computer monitors mounted throughout the room, laptop computers, microphones, and electronic attendance ID card swipe (Bateman, 2017). These specially designed flipped-classrooms are expensive for universities to build and require many resources to support (Messick, 2016). With institutions cutting expenditures on students in higher education by 21% between fiscal years 2008 through 2014 (Allison, 2016), colleges and universities are challenged in allocating funds to build, support, and maintain specially designed active learning classrooms.

Students may also be burdened with additional expenses while enrolled in courses taught with the flipped-class enhanced classrooms. Audience response systems are frequently incorporated into flipped-classes and students are required to purchase clicker devices and/or real-time polling software to respond to instructor questions during class (Gubbiyappa, Barua, Das, Vasudeva Murthy, & Baloch, 2016; Yu & Wang, 2016). Students may also be required to bring laptop computers to class to complete start-of-class quizzes that encourage students to complete all pre-class video, readings, and assignments (Slomanson, 2014). These extra costs can cause financial strains on students who are trying to overcome the continuing increases in their college tuition (Flannery, 2015).

Flipped Class Design Impact on Students' Attitudes- Community of Inquiry (CoI)

A community of inquiry (CoI) can be defined as a learning environment where “students can take responsibility and control of their learning by negotiating meaning, diagnosing misconceptions, and challenging accepted beliefs” (Garrison, 2017, p. 24). Garrison, Anderson, and Archer (2000) developed the community of inquiry (CoI) framework to provide a “generic and coherent structure of a transactional educational experience whose core function is to manage and monitor the dynamic for thinking and learning collaboratively” (Garrison, 2017, p. 24). The CoI framework outlines the process of designing and delivering educational experiences that are deep and meaningful and grounded in the three interdependent elements of teaching presence (TP), social presence (SP), and cognitive presence (CP) (Garrison et al., 2000).

Teaching Presence. Teaching presence (TP) can be defined as “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson, Rourke, Garrison, & Archer, 2001, p. 5). The change in the role of the instructor in flipped-classes can decrease students' perceptions of TP due to students assuming more responsibility of their own learning (Stover & Ziswiler, 2017). Conversely, the flipped-class can increase students' perceptions of TP because the instructor is helping students become acclimated to their new responsibility of assuming more control over their learning by working through problem-solving activities (Kim, Kim, Khera, & Getman, 2014).

Social Presence. Social presence (SP) is defined as the “ability of participants to identify with a group, communicate openly in a trusting environment, and develop personal and affective relationships progressively by way of projecting their individual personalities” (Garrison, 2017, p. 25). Flipped-classes can have an impact on students' perceptions of SP due to new requirement of students working collaboratively to solve problems (Stover & Ziswiler, 2017).

Cognitive Presence. Cognitive presence (CP) is defined “as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (Garrison et al., 2000, p. 11). The flipped-class format can have an impact on students' perceptions of CP due to the requirement of students assuming more control of their own knowledge creation (Mok, 2014).

Flipped-Class Design Impact on Students' Attitudes- Satisfaction

Research findings on the impact of flipped-classes on students' attitudes have been mixed. Some research studies have found students reporting higher levels of satisfaction in flipped-classes due to more active learning activities (Foertsch, Moses, Strikwerda, & Litzkow, 2002; Lage & Platt, 2000; Mooring, Mitchell, & Burrows, 2016; Prince, 2004), feeling more engaged (Enfield, 2013; McLaughlin et al., 2014; Tune, Sturek, & Basile, 2013), and having access to videos that can be reviewed as many times as desired (Brunsell & Horejsi, 2013; Schultz, Duffield, Rasmussen, & Wageman, 2014). However, other studies have found students' levels of satisfaction is reduced in flipped-classes due to

students' anxiety working in groups (Doyle, 2008; Strayer, 2012; Tolman & Kremling, 2017), disinclination toward the requirement of managing their own learning (Hagen & Fratta, 2014), student preference to get content from instructor and not peers (Engin, 2014), and resistance to moving away from their pre-conceived beliefs that an instructor's job is to lecture to passive students (Amresh, Carberry, & Femiani, 2013; Enfield, 2013).

Flipped-Class Design Impact on Students' Learning

Research findings on the impact of flipped-classes on students' learning has also been mixed. There have been some research studies that found flipped-classes have a positive impact on students' learning due to the requirement of needing to be prepared before class (Brunsell & Horejsi, 2013; Enfield, 2013, Van Sickle, 2016), the ability to watch and re-watch out-of-class videos (Sahin, Cavlazoglu, & Zeytencu, 2015), and an increase in students' long term retention (Shatto, L'Ecuyer, & Quinn, 2017; Winquist & Carlson, 2014). However, other research studies have shown no impact on student learning (Adams & Dove, 2016; Baepler, Walker, Driessen, 2014; Jensen, Kummer, & Godoy, 2015; Lape, et al, 2014; Mooring et al., 2016).

Research Questions

This research study seeks to understand the impact of designing a course using limited resources (lecture vs flipped-class) that impacts students' attitudes, learning, and experiences. Specifically, the research questions for this study are:

- RQ1: Does the course design (lecture vs flipped-class) have an impact on students' perceptions of (A) community of inquiry (CoI), (B) teaching presence (TP), (C) social presence (SP), (D) cognitive presence (CP), and (E) satisfaction (SAT)?
- RQ2: Can we predict students' level of satisfaction (SAT) based on students' levels of community of inquiry (CoI)?
- RQ3: Does the course design (lecture vs flipped-class) have an impact on students' learning as measured by their final exam scores?
- RQ4: What were students' overall experiences while in the classes?

Methodology

This mixed methods Institutional Review Board (IRB) approved research study was conducted at a medium-sized university in the Midwest. A concurrent triangulation design was used to gather data because the quantitative and qualitative data were gathered at the same time, analyzed separately, and then used to expand findings (Creswell, 2013). The majority of students (52%) were female ($n = 45$) compared to male ($n = 42$). Students had a range of academic classifications from Freshman ($n = 3$), Sophomore ($n = 56$), Junior ($n = 22$), and Senior ($n = 4$). The majority of students (94%) identified their age as 18-24 ($n = 80$), 25-30 ($n = 2$), 31-40 ($n = 1$), and 41-50 ($n = 2$). There were 107 students enrolled in the two classes (Class #1 = 55; Class #2 = 52); however, only 87 completed surveys resulting in an 81% completion rate. There were 3 records deleted (Class #1 = 2; Class #2 = 1, Table 1) because they were missing more than 5% of the data (Dong & Peng, 2013).

Table 1. Descriptive Data and Data Cleaning Information

Class	<i>N</i>	Total Students	Surveys Completed	5% Missing Data	Final Records
1	Lecture	55	45	2	43
2	Flipped	52	42	1	41
	Total	107	87	3	84

Course Design

Students in the traditional lecture class design (Class #1) completed their readings and problem sets for homework and then attended classes where the majority of class was lecture-based (estimated 80%). Students in the redesigned flipped-class design (Class #2) completed their readings and some problem sets for homework. However, students in Class #2 watched a pre-class lecture recording created by the instructor to substitute for the lecture material. Class time for Class #2 was spent allowing students to work together to solve problem sets. Students in both classes were assessed with two midterm exams, one final exam, and three mini-exams (with lowest score being dropped). The flipped-class also included daily quizzes with the top twelve included in the final score. Students in Class #2 used their own personal electronic devices (cell phones or laptops) to complete the daily quizzes and to respond to free Poll Everywhere polling questions. Both classes were taught in a fixed-seat, auditorium classroom.

Instruments

Community of Inquiry (CoI) Survey. Arbaugh et al. (2008) developed the CoI instrument to measure students' perceptions of their levels of CoI in a learning environment. The CoI framework and survey has most often been applied to studying online and blended-learning environments; however, the CoI framework can be applied to any collaborative learning environment (Garrison, 2016). The community of inquiry (CoI) survey (Swan et al., 2008) was slightly modified to be administered to students in a face-to-face classroom environment. The CoI survey includes three subscales that measure TP (items 1-13), SP (items 14-22), and CP (items 23-34). Validation of the CoI subscales have found high levels of internal consistency with Cronbach Alpha values of 0.94 for TP, 0.91 for SP, and 0.95 for CP (Arbaugh et al., 2008).

Satisfaction Scale. The authors of this research study included questions in an attempt to measure students' level of satisfaction. The fifteen questions were designed using the semantic differential technique (Osgood, Suci, & Tannenbaum, 1957) where students selected a 1 to 7 score between sets of bipolar adjectives (i.e.- Dissatisfaction-Satisfaction). Eight students outside the class enrollees were given a mixed up list of adjectives and asked to select the bipolar opposites for the fifteen matched pairs. Results indicated 100% agreement on seven terms; 87.5% agreement on five terms; 75% agreement on one term; and 62.5% agreement on two terms. Exploratory factor analysis (EFA) with principal axis factoring and varimax rotation was used to identify the underlying relationships between the survey items for the *satisfaction* scale to determine questions that could make up one single *satisfaction* grouping with primary factor loads of .4 or above (Costello & Osborne, 2005) and no cross-loadings higher than .32 (Tabachnick & Fidell, 2001). Results are displayed in Table 2. The *satisfaction* grouping resulted in twelve questions to make up the *satisfaction* (SAT) scale ($\alpha = .96$) indicating an excellent level of internal consistency (DeVellis, 2012).

Table 2: Satisfaction Factor Matrix

Question #	Word 1	Word 2	Factor
Q54	Frustration	Well-being	.845
Q55	Disconnected	Connected	.747
Q57	Lack of interaction	Satisfactory interaction	.725
Q58	Confusion	Clarity	.878
Q59	Defeat	Success	.877
Q60	Anxiety	Security	.775
Q61	Lack of confidence	Confidence	.789
Q62	Silence	Discussion	.652
Q63	Dissatisfaction	Satisfaction	.917
Q64	Bored	Excited	.810
Q65	Disengaged	Engaged	.823
Q66	Unmotivated	Motivated	.758

Results

RQ1: Course Design (Lecture vs Flipped-Class) Impact on CoI, TP, SP, CP, and SAT

The first research question asks if the flipped-class design has an impact on students' attitudes. Students' perceptions of community of inquiry (CoI), teaching presence (TP), social presence (SP), cognitive presence (CP), and satisfaction (SAT) were compared. A Shapiro-Wilk's test ($p > .05$) (Shapiro & Wilk, 1965) and a visual inspection of their histograms, normal Q-Q plots and box plots were examined for Class #1 and Class #2 to determine if the data were normally distributed with a skewness and kurtosis z-value between -1.96 and +1.96 (Cramer, 1998). Data were determined to be normally distributed for CoI, SP, CP, and SAT scores. Differences between classes were examined using an independent samples t-test. However, data were determined not to be normally distributed for TP; therefore, the Man-Whitney U test was run to determine if there were differences between students' perceptions of TP between the two groups (Table 3).

1A- CoI. Results showed a significant difference in students' perceptions of CoI, ($t(81.900) = -3.181, p = .002$, Table 3). Follow up analysis showed the flipped-class design has a medium to large effect on students' perception of CoI ($d = .70$) (Cohen, 1988). Therefore, it can be said that course design (lecture vs flipped-class) has an impact on students' perceptions of CoI.

1B-TP. Mean rank TP scores were statistically significantly higher in Class #2 (50.73) than Class #1 (34.65), $U = 544.00, z = -3.025, p = .002$, using an exact sampling distribution for U (Dineen & Blakesley, 1973). Follow up analysis showed the flipped-class design has a medium effect on students' perception of TP ($\eta^2 = .11$) (Cohen, 1988). Therefore, it can be said that course design (lecture vs flipped-class) has an impact on students' perceptions of TP.

Table 3: Class #1 and Class #2 comparison for CoI, TP, SP, CP, and SAT

Class	<i>n</i>	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>p</i>	Effect size
Community of Inquiry (CoI)							
1	43	126.14	17.585	.377	-.336	.002*	$d = .70$
2	41	138.27	17.352	.094	-.242		

Teaching Presence (TP)							
1	43	51.98	8.17	-.059	-.872	.002*	$\eta^2 = .11$
2	41	57.05	6.45	-.937	1.136		
Social Presence (SP)							
1	43	30.95	5.38	.371	.525	.002*	$d = .72$
2	41	34.93	5.89	.043	-.618		
Cognitive Presence (CP)							
1	43	43.21	7.392	.270	-.083	.061	
2	41	46.29	7.491	.002	.075		
Satisfaction (SAT)							
1	43	55.40	16.045	-.452	-.175	.003*	$d = .70$
2	41	64.68	11.585	-.191	-.734		
* p				<		.005	
Note: Maximum score: CoI = 170; TP= 65; SP = 45; CP = 60, SAT = 84							
Note: Effect size: d = Cohens d, η^2 = eta-squared							
Note: Independent Samples T-Test = CoI, SP, CP, and SAT; Man-Whitney U test = TP							

1C-SP. Results showed a significant difference in students' perceptions of SP, ($t(80.454) = -3.223, p = .002$, Table 3). Follow up analysis showed the flipped-class design has a medium to large effect on students' perception of SP ($d = .72$) (Cohen, 1988). Therefore, it can be said that course design (lecture vs flipped-class) has an impact on students' perceptions of SP.

1D-CP. Results did not show a significant difference in students' perceptions of CP, ($t(81.692) = -1.898, p = .061$, Table 3). Therefore, it cannot be said that course design (lecture vs flipped) has an impact on students' perceptions of CP.

1E SAT. Results showed a significant difference in students' satisfaction scores, ($t(76) = -3.052, p = .003$, Table 3). Follow up analysis showed the flipped-class design has a medium to large effect on students' perception of SAT ($d = .70$) (Cohen, 1988). Therefore, it can be said that course design (lecture vs flipped-class) does have an impact on students' level of SAT.

RQ2: Impact of CoI on SAT

A linear regression was calculated to understand the effect of students' perceptions of community of inquiry on students' satisfaction level. Linearity and homoscedasticity were confirmed with a scatterplot. The Durbin-Watson statistic ($d = 1.97$) confirmed independence of observations. There was no evidence of multicollinearity, as assessed by tolerance values no greater than 1.0. Residuals were normally distributed as assessed by visual inspection of a normal probability plot. The linear regression established that students' level of CoI could statistically significantly predict SAT, $F(1, 82) = 155.036, p < .0005$ (Table 4), accounting for 65.4% of the explained variability in students' level of SAT with an adjusted $R^2 = 65\%$, a large size effect (Cohen, 1988).

Table 4: Summary of Linear Regression Showing CoI Impact on SAT

Variable	B	SE_B	β	t	p
Intercept	-25.502	6.927		-3.682	.000*
CoI	.647	.052	.809	12.451	.000*

* $p < .005$

RQ3: Course Design (Lecture vs Flipped Class) Impact on Final Exam Score

The third research question asks if course design (lecture vs flipped-class) has an impact on students' final exam score. The final exam was a comprehensive exam which consisted of multiple-choice questions, short-answer questions, and problems. The final exam was the exact same in both classes. Data were determined not to be normally distributed based on a Shapiro-Wilk's test ($p > .05$) (Shapiro & Wilk, 1965) and a skewness and kurtosis z-value that was not between -1.96 and +1.96 (Table 5) (Cramer, 1998). Distributions of the final exam scores for both classes were similar, as assessed by visual inspection. Consequently, a Mann-Whitney U test was run to determine if there were differences in final exam grades between classes (Dineen & Blakesley, 1973, Table 5). Median scores were not statistically significantly different between Class #1 and Class #2, $U = 1337$, $z = -.424$, $p = .672$. Therefore, course design (lecture or flipped-class) cannot be said to have had an impact on students' final exam scores.

Table 5: Mann-Whitney Test Comparison for Final Exam scores

Class	<i>n</i>	Mean Rank	<i>M</i>	Skewness	Kurtosis	U	Z	<i>p</i>
1	54	54.74	102.91	-.473	.055	1337	-.424	.672
2	52	52.21	101.13	-.824	1.735			

Note: Maximum score for final exam = 150 points

RQ 4: Students' Experiences

Students were asked an opened-ended question to see if they had anything additional they would like to say about their experiences while enrolled in the class. This question was asked to gain a deeper understanding of the impact of the course design (lecture or flipped-class) on students enrolled in the classes. The top three theme groupings for students' comments are summarized by class in the sections below (Table 6).

Summary of Open-Ended Comments. The open-ended comments indicate the flipped-class design had a positive impact on the students with many more positive comments than the traditional lecture class (90% vs 37%). Students also indicated the flipped-class design enhanced their learning due to higher levels of engagement, opportunities for practicing problems, and access to pre-recorded videos. The students in both sections had positive feelings about their instructor.

Class #1 Traditional-Lecture. The majority of the comments for Class #1 (lecture) were negative (12 of 19, 63%). The largest theme were positive comments (7 of 19, 37%) by students who liked their instructor with comments such as, "*She is a very warm, quirky professor who is always willing to help*". The second highest theme (5 of 17, 26%) were negative comments by students wanting more activities and/or discussion with comments such as, "*There were not a lot of activities during the class. If there were more I feel like it would have helped*". The third highest theme grouping (5 of 17, 26%) were negative comments with students having issues with course design or instructor with comments such as, "*If the only grades collected are test results and a person is naturally anxious about taking tests, this class sets them up to automatically fail*".

Class #2 Flipped-Class. The majority of the comments for Class #2 were positive (27 of 30, 90%). The largest open-ended theme for Class #2 were positive feelings (10 of 30, 33%) about the instructor with comments such as, "*Great professor. Not an easy subject for everyone, but I felt that I learned a lot*". The second highest theme grouping (7 of 30, 23%) were positive comments where students liked

the flipped-class design because it helped them to learn and feel engaged with comments such as, “*I wish all courses implemented [the] “flip” style of class. It was much easier to learn and apply new concepts*”. The third highest theme grouping (6 of 30, 20%) were positive comments where students liked the flipped-class design because they liked working problems with statements like, “*Doing something over and over is how I learn best, and if I got stuck, the teacher was there to help, unlike doing homework and getting stuck/frustrated*”.

Table 6: Open-Ended Comments Theme Groupings

Class #1: Traditional Lecture [19 open-ended comments]	
Positive Comments ($n = 7$, 37%)	Negative Comments ($n = 12$, 63%)
1) Liked instructor (7)	1) Wanted more activities & discussion (5) 2) Course design or instructor issue (5) 3) Issues taking accounting class (2)
Class #2: Flipped-Class [30 open-ended comments]	
Positive Comments ($n = 27$, 90%)	Negative Comments ($n = 3$, 10%)
1) Liked instructor (10) 2) Felt more engaged and learned more (7) 2) Liked working practice problems (6) 3) Liked pre-recorded videos (4)	1) Various reasons (3)

Discussion

This study has shown that it is possible to design and teach a flipped-class using limited resources. The instructor taught the flipped-class curriculum in a traditional classroom designed with tiered stadium-style fixed seating instead of moving to an active-learning classroom specifically designed with small tables to enhance group work. The instructor had students use their existing mobile devices (smart phones or laptops) to take their opening class quizzes instead of moving to a room equipped with university computers. Instead of having students purchase clickers or polling subscriptions, the instructor had students use their mobile devices (smart phone or laptop) to respond to polls through the free Poll Everywhere plan. This instructor’s implementation of flipped-classes makes it much more viable for other instructors working in institutions with limited resources or student expenditure concerns.

The American Institute of CPAs (AICPA) has identified three areas that define the competencies needed by students entering the accounting profession. The framework includes functional competencies (technical skills), personal competencies (individual attributes and values), and broad business perspective competencies (understanding of internal and external business contexts) (AICPA, n.d.). Traditional lecture classes can do an adequate job in teaching students two of these competencies (functional and broad business perspective competencies). However, it is difficult for students to develop their personal competencies in lecture-oriented classrooms because they do not get an opportunity to practice skills (Agyemang & Unerman, 2010) such as problem solving, decision making, interaction, leadership, communication, and project management (AICPA, n.d.). Classes designed with the flipped-class format will provide students the opportunities to practice their personal competency skills because they are working collaboratively with other students to

complete problem-solving activities. Students reported significantly higher social presence ($p = .002$) in the flipped-class because they were required to work with their classmates to solve problems. This allowed students to develop their personal competency skills identified by AICPA.

This research study shows that the flipped-class design improved students' attitudes with significantly higher levels of community of inquiry ($p = .002$), teaching presence ($p = .002$), social presence ($p = .002$), SAT ($p = .003$), and more positive comments (90% vs 37%). The higher levels of CoI were also found to positively predict students' satisfaction levels (65%). The data in this study suggest that faculty designing flipped-classes where students get opportunities to collaborate will result in improved student attitudes. Students in the flipped-classroom reported feeling more engaged, learning more, and liking the practice problems.

Challenging introductory courses (such as this introductory accounting course), often serve as gateway blocks for students because they report feeling these courses are hard and/or boring and have a difficult time completing the course. Finding ways to improve students' attitudes about these courses can help improve students' experiences. This may have a positive impact on enrollment in future programs that depend on students successfully completing these difficult introductory accounting courses. Students that do not complete these gateway courses may end up dropping out of a program or enrolling in an easier program to avoid taking these "hard and/or boring" gateway courses (Killian, Huber, & Brandon, 2012).

One of the goals of this research study was to determine if students had improved learning with the flipped-class design. Students' scores on their final examination did not show any significant gains from the traditional lecture to the flipped-class design ($p = .672$), nor was there a significant increase in the students' cognitive presence scores ($p = .061$). However, there were several open-ended comments where students remarked on their improved learning in the flipped-class design with comments such as, "*It was much easier to learn & apply new concepts*" and "*Going through examples in class and learning most of the lecture outside of class really helped with learning all of the material. Probably my favorite class from a learning viewpoint.*" Examinations do a good job of measuring short-term memory, but have a difficult time measuring students' gains in conceptual learning, personal skill development, or long-term retention. Perhaps the final exam might not be an effective tool to measure all types of learning, therefore, the researchers suggest more research on the impact of the flipped class format on student learning.

Conclusion

This research study shows it is possible to design a flipped-class that can be taught with limited resources and can significantly increase students' attitudes (CoI, TP, SP, and SAT). The study also shows that designing flipped-classes with higher levels of CoI was able to predict higher levels of student satisfaction. While there were not significant changes in students' learning (final exam or CP), the researchers suggest that the final exam might not be a suitable tool to measure students' long-term retention, skills gain, or conceptual gains. This research study is important because it shows that faculty can redesign classes that are normally considered difficult and/or boring to improve students' attitudes. The study is also important because it shows that flipped-classes can be designed to be taught in pre-existing auditorium style classrooms and do not require additional expenditures by students enrolled in the classes. This model will allow faculty with limited resources to redesign their classes to flipped-class format.

Study limitations

There are three primary limitations of this study. First, this study only included 107 students from two

accounting classes in one institution, making the findings not generalizable across other programs or institutions. Second, the students in this study were asked to self-report their perceptions about their own level of community of inquiry and satisfaction while participating in the class. As with all surveys where participants are asked to rate their own perceptions, there could have been response bias with influences that caused the students to move away from accurate responses (Furnham, 1986). Finally, the CoI survey was developed for use in online and blended-learning classes. The verbiage in the survey needed to be modified to be appropriate for students in a face-to-face setting. While the changes made were minor, the updates could have had an impact on the reliability of the instrument.

Areas for further study

A suggested area of further research would be to test students several months after the completion of the course to determine if the flipped-class design has an impact on students' long-term retention of information. Another suggested area of research would be to conduct this study in a different discipline since students in other disciplines also need to develop their personal competency skills such as problem solving, decision making, interaction, leadership, communication, and project management. Lastly, another suggested area of research would be to conduct this study in a classroom specifically designed for group work instead of the auditorium style seating to see if the design of the classroom has an impact on students in the areas examined in this study.

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Improving Critical Reading with E-Texts: A Controlled Study in a Collegiate Philosophy Course

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Abstract: This study investigated the impact of incorporating e-reader texts and annotation tools in multiple sections of an upper level philosophy course ($N_{Control} = 98$; $N_{E-reader} = 76$). This study adds to the body of literature that assesses gains/losses in conventional measures of performance (e.g., scores on graded assignments) and changes in student attitudes as reported in questionnaires. However, this study was unique in that it focused on training students to use e-reader tools for critical reading practices and it included assessment of student annotations and their relationship with the performance measures. Using both quantitative and qualitative data, we tested the hypothesis that, with intentional training and a course-design that provided multiple opportunities for practice and feedback, students using e-readers for critical engagement with their reading assignments would demonstrate (a) deeper understanding of the content of the texts, (b) improvement in their use of critical reading practices, and (c) improvement in their attitudes toward the use of e-readers for academic work. While we did not observe significant gains in graded assignments compared with control groups using printed texts, we found no evidence of losses for students using e-readers. At the same time, we found evidence of improvement in students' critical reading practices, especially when paired with modeling and practice throughout the term. We also observed significant positive changes in student attitudes toward the use of e-readers for academic work, compared with controls. Our findings suggest that achieving the benefits of e-readers for the development of critical reading skills requires a course with design elements that are specifically tailored to this purpose.

Keywords: critical reading, e-text, e-book, e-reader, annotation, course design

Critical reading, or what some scholars have called “deep reading” (Wolf & Barzillai, 2009), is vital to contemporary democratic citizenship, insofar as a flourishing liberal democracy depends on informed, engaged, and well-read citizens who are the key decision-makers in the democratic political system (Dahl, 2000). The skills associated with critical reading should therefore be central elements of a liberal education that aims to prepare students for responsible democratic citizenship (Nussbaum, 2006).

Critical reading can be distinguished from ordinary reading by the degree to which readers engage critically with the text. Where ordinary readers aim to understand the central message, thesis or narrative of a text, critical readers go further. We offered an account in 2014:

[Critical readers] pay attention to the genre of the text and what might be known about the author's context. They aim to make sense of the author's support, defense, and development of the central message. They also challenge the text, raising questions and objections not only about the truth of the central message, but also about the author's argument in its defense. In the end, they see each text as part of a conversation in which their own

reflections become new contributions to advance our collective understanding of the issues in question. (Jensen & Scharff, 2014, p. 83)

Instructors and students face challenges when it comes to teaching and developing critical reading skills. For example, it takes more time and effort to critically read a text (Wolf, 2009); time and effort that students may not be prepared to invest, especially when studies suggest that over 70% of students have not completed the assigned reading for a given class day (Hobson, 2004). It also takes money and planning to critically read: students must have a version of the text with space to mark it up, together with the appropriate resources necessary for investigation, note-taking, and so on. The rising prices of academic books have increased the incentive for students to borrow, rent, or sell them back, which correspondingly reduces the chances that they will mark them up (Scharff & Dull, 2011). Finally, it is important to note that, especially for college educators, students may have already developed reading habits that are inconsistent with good critical reading (ACT, 2007). Changing students' reading habits may be difficult, especially if the initiative to improve students' critical reading skills is concentrated in just a single general education class, e.g., a first-year literature course.

Recently, some scholars have become concerned that the development of critical reading skills is being further undercut by the cultural shift from reading on paper to reading on a screen. A great deal of research has been undertaken to study these changes (see the literature review by Singer and Alexander, 2017). Neuroscientist Maryanne Wolf has discovered that our brains work differently when we read a paper text versus an e-text (Wolf, 2010). Her results indicated that when we read critically in the paper environment, we have conditioned ourselves to read deeply, bringing the whole of our cognitive faculties to the text. But in the electronic environment, we tend to "short-circuit" this process: we skip around the page and do less analytical work. Comparative reading comprehension studies appear to bear this out. Daniel and Woody (2013) found that students' reading comprehension in the electronic environment was similar to reading comprehension in a paper environment, but that it took students longer to read electronic texts. Further, Singer and Alexander (2016) found that while students predicted that they would do better on follow-up tests when working from an e-text, this was not actually the case.

More generally, many readers, especially academic or critical readers, seem to think that their critical reading faculties work best with a book that has a physical location with fixed physical pages (Baron, 2015). Electronic books, on the other hand, seem to them to be too detached or distant (Dirda, 2015), and screens are cluttered with other distracting elements (Klinkenborg, 2010; Daniel & Woody, 2013). Moreover, research seems to indicate that the physical chunking of a text into pages is important for reading comprehension (Tanner, 2014). To be sure: many of these commentators support the use of screen-reading for many uncritical tasks, such as newsgathering, shopping, and social media (Foasberg, 2014). But for critical and academic tasks, they say, paper is still best (Jabr, 2013).

We take a more optimistic view on the possibilities for cultivating critical reading skills in an academic e-reading environment. In a previous paper (Jensen & Scharff, 2014), we wrote:

E-texts and e-readers offer tools that overcome the challenges posed by paper textbooks. In an e-text, students can insert (and delete or change) highlights and annotations and they won't ever run out of room to elaborate their thoughts. More importantly, with some thoughtful course design, teachers using e-texts in the classroom can publicly model the art of critical reading while students can work as true apprentices, receiving feedback as they work in class or through the easy electronic sharing of annotations. In our view, the fact that

e-texts can make the previously private act of critical reading into a public act represents one of the most positive transformational aspects of these new technologies. (pp. 83-84)

We are not alone. Alan Dennis and his team at Indiana University have conducted a number of studies of e-reader use at their institution (Dennis, 2011; Dennis, Morrone, Plaskoff & McNamara, 2015; Dennis, Abaci, Morrone, Plaskoff & McNamara, 2016). They begin with assumptions that we share about the importance of critical reading skills for learning:

Learning is not a passive process where students simply receive information, but an active process in which students co-construct knowledge. They build upon prior knowledge and experience as they make sense of the textbook, revising their own current understanding as they encounter new ideas and information and as they test their current schema. Annotation of texts can make an important contribution to both the cognitive and metacognitive aspects of learning. Underlining and highlighting may assist in recall. More complex annotation strategies, such as summarizing, paraphrasing, finding examples, and asking questions, contribute to metacognitive monitoring and enhance learners' self-regulation, recall, and comprehension (Dennis et al. 2015, 5254-5255).

However, to date, Dennis and his colleagues have focused on the learning benefits gained when instructors share their own annotations with students. They have not studied the learning benefits that might be achieved when students write and/or share their own annotations. For example, in their 2016 study, they describe the effect of embedding instructor annotations in a textbook. Students with access to instructor annotations performed better on subsequent tests of the material than students with access to the text alone. These results are suggestive, but they do not answer questions about the learning potentialities associated with students' own development and use of critical thinking practices (such as annotating a text) in a e-reader environment.

In this paper, we describe our own study that engages this question directly: "What impact does a course intentionally designed around cultivating critical reading skills in an e-reader environment have on student learning?" We share the view of Dennis and his team that e-readers have the potential to enhance students' critical reading skills and the view that they have this potential in light of the specific tools available in e-reader apps that allow students to bookmark, underline, outline, cross-reference, search, and annotate a text. However, we also believe that in order for students to make progress in the development of their critical reading skills in an electronic environment, they must do it themselves. Based on our earlier work (Jensen & Scharff, 2014), we also believe that they must be intentionally taught how to do this. In other words, we believe that instructors must teach students how to make use of electronic tools for critical reading in order for students make learning gains. Instructors must also provide opportunities and assignments that enable students to transform these practices into habits. Merely providing e-readers that have the relevant tools is not enough.

Our study was situated in an upper-level ethics course that is required of all students at the U.S. Air Force Academy. This course is designed to invite serious engagement with primary texts in a discussion setting. Most of the readings are therefore selected from key historical figures (e.g., Plato, Aristotle, Immanuel Kant, and John Stuart Mill) and the classes are restricted to roughly fifteen students. This setting was a natural fit for this kind of study, insofar as the learning outcomes for the course include the cultivation of critical reading skills. We conducted our study across a spring semester and a fall semester. This gap allowed us to refine the pedagogy of the test sections in response to instructor observations, student performance, and student feedback. Test group sections (hereafter, Kindle group sections) were required to install the Kindle App for PC and purchase

Kindle versions of the course texts. Control group sections worked from paper versions of the same texts.

The overall research question that guided our studies was as follows:

What effect would the use of e-texts, together with training and modeling, have on student learning, student attitudes, and student behaviors, when compared to students in control sections who worked from paper texts?

We began with three sets of hypotheses. First, by building electronic annotation requirements into the course and including explicit instructor modeling of how to make and benefit from quality annotations, we predicted that the Kindle group students would become adept at using annotation features in the Kindle reader and, over time, develop better annotation habits. Better annotation skills would be evident if the Kindle group self-reported more increases in their use of annotations than the Control group as well as if we observed an increase in the depth and quantity of annotations submitted by the Kindle group across the semester. Second, by increasing the quality and quantity of their annotations, we predicted that Kindle group students would more deeply process the readings, and thus perform better on the matched final exam questions than the Control group. Also related to performance, for the Kindle group we predicted that depth and quality of their submitted annotations would positively correlate with other performance measures in the course (pre-class reading assignment grades “preflights,” paper grades, individual exams, and the overall course grade). Third, because they developed greater familiarity and appreciation for the e-text annotation features across the semester, we predicted that the Kindle group would show a positive shift in their perceptions of e-texts compared to the Control group. Finally, as an ad hoc hypothesis, due to pedagogical improvements to the Kindle sections of the course between the spring semester and the fall semester, we predicted improvement in all three of the areas above.

Methods

Participants

Participants in this study included students enrolled in thirteen sections of an upper-level, core-required Ethics course, with ten to fifteen students per section. In the spring, we evaluated three Kindle sections and four Control sections. In the fall, we evaluated three Kindle sections and three Control sections. Overall there were 76 students in Kindle sections and 98 students in Control sections. Kindle sections were taught by Dr. Jensen (first author of this paper); Control sections by another member of the philosophy department. Students at the U.S. Air Force Academy are not free to select their instructors for required courses that are taught in multiple sections by multiple instructors. Instead, the registrar assigns students to sections that best accomplish balance in their schedules. This results in a quasi-randomized selection of students in each section who have roughly the same demographic and aptitude mix.

Design and Materials

This study incorporated a two-group comparison design (Kindle sections compared to Control sections), with some additional analyses comparing the spring versus the fall semester for both groups and pre-versus-post semester time periods within each semester. Dependent variables included multiple measures of academic performance as well as self-reports of attitudes and learning behaviors.

The main two-group comparison of academic performance used scores on three common final exam questions, scored using a shared rubric and blind grading of the combined group of exams. Within the Kindle group, we also analyzed the relationships between completion of and performance on pre-class writing assignments based on the reading, paper grade scores, exam scores, and the number and type of text annotations. Text annotations were evaluated for research purposes only, not for grades. We made separate counts of highlights and other types of annotations. We then categorized the annotations as one of four types: annotations that outline the text, annotations that connect the text to other texts and experiences, annotations that question the text, and annotations that raise objections to the text. At the same time, for each of these types, we scored the annotation as reflecting either a “high” level of critical engagement or a “low” or superficial level of critical engagement. For example, a superficial objection in the electronic margin might be as simple as “Wrong!” while a highly engaged objection might show up as several sentences of reasons why the author is wrong.

Beyond measures of academic performance, we created a questionnaire to assess student attitudes and learning behaviors. For all sections during both semesters, we used the same pre-semester form. In the spring, the post-semester forms for the Kindle and the Controls sections were slightly different. In order to obtain more directly comparable results, we used identical post-semester forms for Kindle and Control sections in the fall. On the pre-semester and post-semester forms, both the Kindle and the Control sections were asked about their preference for print or electronic texts (closed-ended), their reasons for these preferences (open-ended), the extent to which they experienced distractions when using their electronic device (open-ended), and to describe their typical annotation behaviors (closed-ended; choose one of seven options: tend not to read; read only what is absolutely necessary; skim assigned readings; read assigned readings; read and highlight or underline; read, highlight and annotate; read, highlight, annotate and separate notes). On the post-semester questionnaires only, students were additionally asked to explain any perceived changes in their annotation habits (open-ended), and whether or not they recommended wider adoption of e-texts at our institution (open-ended; not asked of the Control group during spring semester).

Procedure

In the six Kindle sections (three each semester), students were required to install the Kindle App for PC and acquire all of their textbooks through the Kindle store. In the seven control sections (four in spring and three in the fall) students used paper books. The Kindle sections were all taught by Dr. Jensen; the control sections were all taught by another instructor. While the Kindle and Control sections did not work from an identical syllabus, all sections of Ethics taught at the U.S. Air Force Academy have identical learning objectives and conform to a “Course Contract” that requires a specific set of readings, reading-centered seminar-style discussions, a final paper, and a final exam. The main texts for Dr. Jensen’s sections were Plato’s *Republic*, Kant’s *Groundwork for the Metaphysics of Morals*, Mill’s *Utilitarianism*, Aristotle’s *Nicomachean Ethics*, and David Fisher’s *Morality of War*. Dr. Jensen also assigned three short papers that required a close analysis of a key passage from a text. Every student wrote a paper on Plato and Fisher; for the third, students could select from Kant, Mill, or Aristotle. In addition, Dr. Jensen and the other instructor developed a common set of ten short answer questions for the final exam based on shared texts between the Kindle and Control sections: Aristotle’s *Nicomachean Ethics*, Immanuel Kant’s *Groundwork for the Metaphysics of Morals*, and John Stuart Mill’s *Utilitarianism*. It should be noted that, despite the structural similarities between Kindle and control classrooms and the close collaboration between Dr. Jensen and the other instructor, differences in their teaching styles and the open-ended nature of seminar-style discussions are potential confounding variables. In the discussion below, we are careful to distinguish

comparisons that are made between sections taught by different instructors and comparisons that are made between sections taught by the same instructor. We also qualify our analysis in accord with these limitations.

Distinctive pedagogical features of Kindle sections included the following. First, on the second day of class of both the spring and fall semesters, Dr. Jensen taught a lesson on critical reading practices with the Kindle App for PC. Critical reading practices include highlighting the text, outlining the text using the annotation function, as well as annotating the text with questions, comments, and objections using the annotation function. Students were also taught how to aggregate and submit their annotations for research purposes. During the spring semester, student annotations were collected at the middle and end of the term for research purposes; they were not graded. During the fall semester they were collected at the end of each of the five units / philosophers. Second, Dr. Jensen assigned pre-class writing assignments based on the day's reading assignment, which required students to bring a typed question, comment, or objection to class for discussion. Students were assigned approximately 25 pre-class writing assignments over the course of the term. These assignments were graded on a four-degree scale: not-proficient (zero), proficient (75%), highly proficient (88%), and mastery (100%). Third, throughout the course of the term, Dr. Jensen led the class discussion from the e-text itself, and his highlights and annotations were projected onto the screen. For each main text in the course, at least one class session was devoted to an in-class group assignment focused on understanding and evaluating important passages.

After reviewing his experiences teaching with the Kindle App in the spring, Dr. Jensen made the following additions to the fall semester course. First, he collected student annotations five times rather than twice. Five sets of annotations made more sense, given that there were five discrete texts. Second, as part of submitting their annotations, students were also required to submit a short metacognitive reflection paper that required them to reflect on their experience with critical reading in the e-reader environment. This assignment asked students to briefly explain their sense of how well they understood the text, their perception of how reading in the electronic environment did or did not contribute to their understanding of the text, and their perception of how their use of the skills of critical reading (e.g., highlighting and annotating) contributed to their understanding of the text. This assignment forced students to reflect on their experience with e-reading with an eye on how their practices could be improved for the next book.

Control sections, like the Kindle sections, were small seminars based on discussion of the texts. Reading assignments in Control sections were of similar length to those in Kindle sections and from the same texts. With the exception of common final exam questions, Kindle sections and Control sections did not have other academic work exactly in common. However, as all sections had the same overall course objectives, Kindle sections and Control sections alike were focused on close readings of primary sources in order to identify and critically engage with the same set of themes.

To capture students' attitudes and perceptions of their behaviors, a neutral third person not associated with the class administered the questionnaires to all sections on the second day of class and again during the final week of class. Students were informed that participation was voluntary, that names would be removed from the data set once data were linked at the end of the semester, and that instructors would not have access to any of the questionnaire data until after grades were submitted at the end of the semester. Students were given 10-15 minutes at either the beginning or end of the lesson to complete the questionnaires during class time.

Results

Prior to analyses, pre-post questionnaire responses were linked and names were removed. Recall that the only data collected for the Control group were the pre and post questionnaire responses and the

common final exam question scores. Thus, Kindle vs. Control comparisons were only possible for those measures. Within the Kindle group, where we had additional performance measures, we completed some additional analyses comparing spring vs. fall semester and some correlations between annotations and performance. For the questionnaire data, for each question we first performed Chi Square comparisons between spring and fall semesters for each group to determine whether or not we could collapse the semester data, leaving two key groups for analysis: all Control and all Kindle.

H1: Annotation Data – Self-reported and Performance measures

We hypothesized that by building electronic annotation requirements into the course and including explicit instructor modeling of how to make and benefit from quality annotations, the Kindle group students would become adept at using annotation features in the Kindle reader and, over time, develop better annotation habits. Annotation data included two questionnaire items that asked students about their annotation practices at the end of the semester, and categorical scoring of the annotations submitted by the Kindle group. The first annotation question on the questionnaire asked, “Did you perceive a change in your annotation habits, i.e. use of outlining, questions, connections, objections, in this class during the course of the term?” Response options included “Got worse,” “No change,” “Somewhat different,” and “Significant change.” There were no fall-spring differences within either the Kindle or the Control groups, although there was a positive pattern for more change in the fall semester Kindle group compared to the spring (38% reported significant changes in the fall while only 20% did so in the spring), perhaps due to the fall semester course design changes that more explicitly incorporated annotations and metacognitive reflection. With semesters combined, the Control vs. Kindle comparison was highly significant, with 81% of Control group participants reporting no change in their annotation habits, while 74% of the Kindle group reported “Somewhat different” or “Significant change,” $\chi^2(3) = 66.65, p < .01$.

The second annotation question asked students to indicate the types of reading and annotation practices in which they engaged for both their core courses and major’s courses. There were seven response options: Tend not to read; Read only what is absolutely necessary; Skim assigned readings; Read assigned readings; Read and highlight or underline; Read, highlight and annotate; Read, highlight, annotate & separate notes. The number of students responding “tend not to read” was essentially zero, so this level was not included in the analyses. Chi Square analyses showed no significant differences between the groups at any time (pre-post or spring vs. fall) within either type of class (core or major). However, there were significant differences between core and majors courses for pre semester (all students combined), $\chi^2(5) = 14.14, p < .05$. Students in general were more likely to engage in more reading and annotation for the majors courses (almost all responses in the top four levels) than for the core courses (almost all responses in the bottom four levels). There was a similar trend at the end of the semester, but it was not significant.

For the Kindle group only, we also compared the actual numbers and types of annotations across the semester for both spring and fall. Remember that the text annotations were categorized into one of five types: highlighting, outlining, connecting, questioning and objecting. For analysis, annotations were grouped into three categories: highlighting, low-level annotations (superficial levels of each of the remaining four types of annotation) and high-level annotations (more in-depth examples of the remaining four types). The time factor was assessed by comparing the number of annotations for five different philosophers that were discussed in order across the semester: Plato, Kant, Mill Aristotle, and Fisher. Because the different texts were different lengths, the number of annotations in each category was tallied and then divided by page count in order to give a measure of annotations per page per philosopher. We performed a 2 (semester: spring, fall) x 3 (types of

annotation) \times 5 (time / philosopher) mixed ANOVA using the annotations per page data. This analysis resulted in all main effects and interactions being significant except the interaction between semester and time/ philosopher. See Figure 1 for graph of the means for each condition. Overall, the students in the fall semester produced more annotations than those in the spring, $F(1,592) = 13.54$, $p < .01$, partial eta squared = 0.16. There was a significant decrease in the number of annotations across the semester, $F(4,592) = 44.82$, $p < .01$, partial eta squared = 0.38, and there was significantly more use of highlighting than of low-level annotations, and more low-level than of high-level annotations, $F(2, 592) = 104.97$, $p < .01$, partial eta squared = 0.59. The significant interaction between semester and type of annotation, $F(2, 592) = 11.13$, $p < .01$, partial eta squared = 0.13 showed that, while use of all three types of annotation were greater in the fall than in the spring, the greatest difference was in the use of highlighting. The significant 3-way interaction, $F(8, 592) = 3.61$, $p < .01$, partial eta squared = 0.05 further modified these effects by showing that the decrease across the semester was much more gradual in the fall semester than in the spring semester.

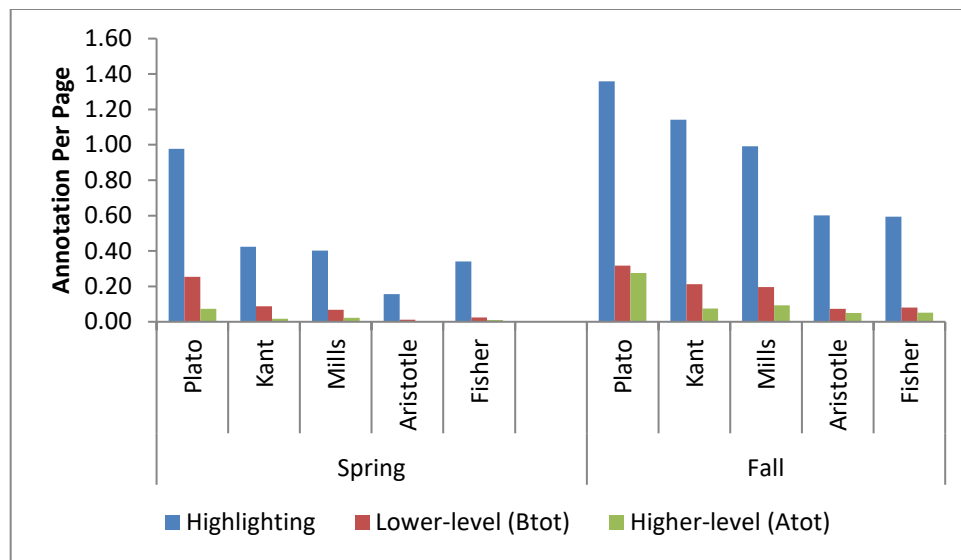


Figure 1: Kindle Annotation Results: Spring vs. Fall

H2: Performance Data – Group Comparisons

We predicted that by increasing the quality and quantity of their annotations, the Kindle group students would more deeply process the readings, and thus perform better on the matched final exam questions than the Control group. Also related to performance, for the Kindle group we predicted that depth and quality of their submitted annotations would positively correlate with other performance measures in the course (preflight grades, paper grades, individual exams, and the overall course grade). Prior to completing any Control versus Kindle group comparison analyses on the final exam scores, we created three average scores, one each for each philosopher (Kant, Mill, Aristotle) from the 10 common short-answer questions. We also checked to see whether or not we should include prior GPA as a covariate. GPA did significantly correlate with each of the three average scores (Kant, Mill, and Aristotle, $r = 0.25$ and $p < .05$, $r = 0.29$ and $p < .05$, and $r = 0.35$ and $p < .01$, respectively). However, there was not a significant difference between the two groups, $t(172) = 1.84$, $p = 0.07$. Thus, we did not include it as a covariate. Because students had some choice in which exam questions they answered (pick 8 out of 10 questions), the same individuals did not respond to each question and the number of students answering each question was different. Thus,

for each of the three common final exam average scores, we performed an independent groups t-test on the data. Although in each case the Kindle group had higher overall scores, there were no significant differences for the Kant average scores, $t(172) = .75$, $p = .45$ or for the Aristotle average scores, $t(172) = 1.00$, $p = .31$. There was, however, a significant difference in the scores on the Mill average scores, $t(172) = 8.66$, $p < .01$, with the Kindle group scoring higher than the Control group.¹

In addition to the two-group differences in performance on the three average scores, we were curious whether or not annotation performance for the Kindle group would predict grades on other performance measures. Thus, we ran correlations between each of the three categories of annotation (Highlighting, Low-level, and High-level) with each of the aligned performance measures (e.g. Kant annotations with the Kant paper grade, the Kant average score, the Kant pre-flight performance, and the overall course grade).

Depth and quantity of annotation engagement did seem to predict grades on papers, see Table 1. However, although all correlations were positive, the only significant correlations were between High-level annotations and paper grades.²

Table 1: Correlation r values between the three categories of annotation and performance on the aligned paper grades (* $p < .05$).

	Plato paper (N=76)	Kant paper (N=9)	Mill paper (N=32)	Aristotle paper (N=35)	Fisher paper (N=76)
Highlighting	0.11	0.30	0.30	0.10	0.03
Low-level	0.14	0.40	0.25	0.28	0.02
High-level	0.25*	0.19	0.37*	0.35*	0.10

The number and depth of annotations were also somewhat predictive of the other aligned performance measures and especially the overall course scores. For the final exam score, only the number of high-level annotations per page for the Aristotle reading significantly correlated with the average score on the Aristotle final exam questions. For the preflights, the number of high-level annotations was the best predictor of grades, but, annotation engagement in the other categories was also sometimes significantly predictive. Both the number of high-level and low-level annotations significantly predicted final course grades, although even highlighting showed a positive relationship that was nearly significant. Overall, engagement in high-level annotations was the most consistent predictor of performance on other course assignments and final course grade.

¹ This difference was almost entirely driven by differences in scores between Kindle and Control sections on one final exam question. While both Dr. Jensen and the other instructor assigned the text underlying the question and agreed that it was a good question for the test, it may be that the classroom discussion associated with the text was different.

² There were no significant correlations for the Kant paper, likely due to the very small number of students who chose to write that paper, nor the Fisher paper, possibly due to the much smaller number of annotations overall by the end of the semester.

Table 2. Correlation *r* values between the three categories of annotation and performance on the aligned final exam scores, preflight grades, and overall course average (* *p*<.05).

	Kant Final Exam	Mill Final Exam	Aristotl e Final Exam	Plato Prefligh t	Kant Prefligh t	Mill Prefligh t	Aristotl e Prefligh t	Fisher Prefligh t	Final Cours e Grade
N = 76									
Highlightin g	-0.09	0.17	0.04	0.20	0.32*	-0.01	0.03	0.23*	0.22
Low-level	0.11	0.15	0.11	0.11	0.32*	-0.06	0.14	0.22	0.27*
High-level	0.10	0.15	0.27*	0.33*	0.31*	0.06	0.15	0.23*	0.31*

H3: Attitude data – Kindle and Control group comparisons

We predicted that because Kindle group students developed greater familiarity and appreciation for the e-text annotation features across the semester, they would show a positive shift in their perceptions of e-texts compared to the Control group. Unlike the exam performance data, there were significant pre-post differences between the Kindle and the Control groups with respect to questionnaire data. For the question, “At this point in time, would you prefer to read an e-text or a printed text for academic work?” there were no differences between the two groups at the beginning of the semester, with most of the students in both groups reporting that they preferred printed texts (70% of Control and 69% of Kindle), $\chi^2(1) = 0.03$, $p > .05$. However, there was a significant difference at the end of the semester, with an increase in the number of Kindle group students reporting a preference for e-texts (65%), $\chi^2(1) = 20.43$, $p < .001$, and no change in the preferences of Control group students.

We did a qualitative categorical analysis of the reasons students gave for their preferences between print and e-text. First, the open-ended responses were reviewed and five global categories were formed: Ease of use / speed of reading / ability to annotate; Eye strain; Habit / tangibility of print copy; Cost / convenience / weight; Problem with Distractions. Responses were then categorized and tallied for 4 subgroups pre and post (Control group students who reported preference for the print version, Control group students who reported a preference for the e-text, and the same two subgroups for the Kindle group), and Chi Square analyses were performed. The only group showing a significant pre-post difference in reasons for their preference was the Kindle subgroup that reported preferring the e-text. They reported significant increases in ease of use and convenience. Pre and post comparisons between those who reported preferring print (regardless of group, Kindle or Control) compared to those who preferred e-texts (regardless of group, Kindle or Control) show that those who report preferring print are significantly more likely to choose eye strain, habit, or distractions as reasons for their preference, $\chi^2(4) = 20.67$, $p < .01$ and $\chi^2(4) = 20.93$, $p < .01$, pre and post, respectively.

When reporting level of problems with distractions, there were no differences between Kindle and Control at pre-semester (50% of both groups claiming no problem, ~30% claiming a moderate problem, and ~20% claiming a big problem). However, there were significant differences post semester, $\chi^2(2) = 14.94$, $p < .01$. The majority of the Control group (54%) reported smaller levels of distractions, with 32% reporting “about the same” and 14% claiming bigger problems. In contrast, 28% of the Kindle group reported a smaller level of distraction, 68% claimed “about the same” and 28% claimed bigger problems.

Finally, students were asked “Would you recommend wider adoption of electronic books in courses at USAFA?” At the end of the fall semester (no spring Control group data) there were significant differences between the Control and the Kindle groups, $\chi^2(2) = 8.29$, $p < .05$, with 55% of the Kindle group saying “yes” that they should be more widely adopted, 27% saying “it depends” and 17% saying “no.” In contrast, only 40% of the Control group recommended further adoption, with 8% saying “it depends” and 52% saying “no.”

Discussion

A review of our results offers support for many but not all of our current hypotheses, and provides support for our earlier preliminary conclusions (Jensen & Scharff, 2014) that critical reading is challenging to develop, that a course design that pervasively incorporates development of annotation skills using an e-text is effective, and that practice using an e-text and its annotation features can lead to significant positive shifts in attitudes about e-texts.

With respect to the first set of hypotheses regarding the development of critical reading annotation skills, our results offer encouragement for the explicit course design centered on the incorporation of the e-text annotation practices; however, the results also reinforce the challenge of getting students to engage in critical reading. By the end of the semester, the Kindle group was significantly more likely to report increases in their engagement in annotation behaviors than the Control group. Further, although it was not a significant difference, almost twice as many Kindle group students in the fall reported a “significant change” in their annotation habits when compared to the spring. These results suggest that a combination of frequent requirements to engage in annotations combined with explicit in-class modeling, multiple checkpoints (added fall semester) and periodic reflection (added fall semester) are effective in shaping student critical reading behaviors.

Unlike predicted, however, the overall number of annotations decreased across the semester in the Kindle group, rather than increased, although this decrease was significantly less severe in the fall semester when annotation requirements were more pervasive throughout the semester. The overall decrease in the number of annotations is not too surprising as many students start a semester with good intentions, and then decrease their levels of reading and other learning behaviors as the semester goes on. Reading critically requires time and effort (Wolf, 2009). Thus, some of the decrease could be due to constrained schedules as overall student workload increases across the semester, but some might also be due to students learning what is really required for “success” in a course. If students realize that they can do well in a course with less effort, most of them will decrease their effort. The fact that there was significantly less drop-off in the number of annotations in the fall compared to the spring, and the trend toward the significant increases in spring-fall self-reported annotation engagement, underscore the influential role that an instructor’s expectations and course design have on student behaviors: there was better engagement with more explicit and pervasive incorporation of critical reading. An additional factor to consider with respect to levels of critical reading annotation behaviors is the type of course. Both the Kindle and the Control group students were significantly more likely to report engaging in deeper reading and higher-level annotation for their majors courses than for their core courses. Thus, early core courses might be particularly key targets of opportunity for explicit critical reading development.

Our second set of hypotheses focused on the impact of e-text annotation engagement on performance in the course. Overall, if there were differences between the Kindle and Control group, or significant relationships between engagement in annotations and performance for the Kindle group, they supported the benefit of the e-text annotation behaviors. These performance results complement those by Dennis et al. (2016), who showed that access to instructor annotations can increase student performance on exams. Going into our study, we had expected greater differences

between the Kindle and the Control groups. However, given the overall low rates of engagement in high-level annotations, and the fact that high-level annotations are better predictors of performance than highlighting or low-level annotations, the lack of a large effect is not surprising. It does highlight the need for even more course redesign to better support engagement in those high-level annotations.

Also of interest with respect to student performance, and unlike what has been suggested by some prior research (e.g. Baron, 2015; Jabr, 2013; Wolf, 2010), there seemed to be no detrimental effects of using e-texts rather than printed texts. Further, the fact that high-level annotations best predicted performance across a variety of course assessments suggests a distinct benefit of e-texts compared to printed texts. Students are often hesitant to write in printed texts because more marks lead to lower re-sale value (Scharff & Dull, 2011). They are also constrained by the small margins of many college textbooks. Both of these deterrents would be especially true for high-level annotations, but importantly, these two deterrents do not exist for e-texts.

Our third set of hypotheses focused on student attitudes about e-texts and how regular interaction with an e-text and its features might impact those attitudes; we predicted that Kindle students would develop more favorable attitudes toward e-texts as they developed familiarity with them. The aspect of familiarity is key, because otherwise attitudes comparing printed texts and e-texts are likely to be biased toward printed texts, which are much more familiar and which don't require training on how to interact with them. Our pre-semester results clearly supported prior research suggesting that students have a preference for printed texts (Baron, Calixte, & Havewala, 2017); more than two-thirds of both of our groups reported such a preference to start. These students reported that eye strain associated with electronic screens, prior reading habits, or distractions in the electronic environment were reasons for their preference. However, by the end of the semester, two-thirds of the Kindle group students reported a preference for e-texts, while there was no change in preference for the Control group students. The most commonly reported factors for those preferring the e-text were ease of use and convenience. These shifts in preference likely also underlie the significant difference between the Kindle and Control groups with respect to their agreement that e-texts should / should not be more widely adopted. By the end of the semester, 52% of the Control group students but only 17% of Kindle group students said they should not be more broadly adopted.

These attitude results reveal a major weakness of other studies that examine attitudinal data drawn only from single-point-in-time questionnaires (e.g., Baron, 2017). Like most new technologies, adoption rates and preferences change through use and habituation, provided that the technology in question can eventually bring about positive change. This fact is especially important in the academic setting, where the skills, knowledge, and habits that we aim to cultivate are complex. It often takes focused practice, intentionally directed toward the formation of new habits, in order to see progress toward educational goals. Even achieving a novice proficiency at some learning goals can take months; mastery may take years. While the 10,000 hour rule popularized by Malcolm Gladwell may not apply here, the underlying principle that success requires concentrated effort and regular practice, together with the fact that preferences for a new technology follow on the achievement of success with that technology, suggest that simple, one-time assessments of students' preferences are not all that useful. Our data explicitly make this point, insofar as they demonstrate significant change in attitudes over time when coupled with consistent use of the technology.

A final attitudinal result that must be acknowledged is the significant difference in the level of problems with distractions reported between the Kindle users and Control group students by the end of the semester. Although the majority of Kindle users reported a decrease or no change in distractions, almost 30% claimed an increase in distractions. In contrast, only 14% of the Control group reported an increase in distractions when using electronic texts (presumably for other

courses). Unless students use an e-reader only device, such as a Kindle Paperwhite, rather than a computer, the issue of distractions is common and powerful. Instructors across the disciplines struggle with students' multi-tasking in their classrooms, to the detriment of their learning (McCoy, 2013). There are numerous suggestions ranging from discussions of negative learning impact, demonstrations of deleterious effects, banning of electronics, to a *laissez faire* acceptance and belief that it's the student's choice to be distracted or not (Levy, 2014). We suspect that many of these challenges are best understood as the ordinary growing pains associated with human adaptation to new practices and technologies. As we discover virtues and vices associated with these technologies, we will modify our technologies and develop habits that will be conducive to curtailing vice and encouraging virtue.

Conclusions

Based on our data and analysis, it seems to us that both promoters and detractors of e-readers in the critical reading environment overstate the case. Promoters are mistaken in thinking that simply distributing the technology will be sufficient to confer a benefit for student learning. Our research suggests that critical e-reading, especially for academic purposes, comprises a set of skills and habits that must be taught, modeled, and reinforced in the classroom. It suggests further that progress may be slow and that instructors must be willing to make regular adjustments to their pedagogies in order to achieve learning benefits. Nevertheless, our research also suggests that learning benefits are available for critical reading using e-texts and e-tools—benefits that may surpass those that can be achieved in the paper environment.

Detractors, often relying on snapshot attitudinal data (Woody, Daniel, & Baker, 2010; Baron, Calixte, & Havewala, 2017), are too quick to dismiss the potential for critical reading practice in the electronic environment. Our longitudinal data undercuts the detractors' claims that e-readers are neither preferred by students nor confer a learning benefit to students. Further, we are optimistic that as engineers refine e-readers and their analytic tools, critical e-reading will be more effective and attractive. Technical improvements, such as improvements in readability, page tracking, and annotation tools, will make adoption more attractive. Wider adoption, together with intentionally cultivated practices, will change the critical reading culture.

Concerning the structure and methods of our study, Singer and Alexander have recently argued that, on the basis of a comprehensive literature review, studies comparing e-reading and paper reading need to better "address critical dimensions such as learner differences, text characteristics, and task demands." (Singer & Alexander 2017, p. 1034) Our study begins the process of answering these calls. First, by situating our study in a core course rather than a majors course, we were able to assess impact using a wide range of learners. Second, by including data from five different texts, we were able to compare performance across a variety of textual characteristics. To be sure: all of these texts were associated with the field of philosophy. It will be important for other researchers in other disciplines to compare e-reading and paper reading in their disciplines in order to capture a wider range of text characteristics. Finally, by assessing the quality of student annotations, we were able to assess much more directly the quality of student engagement with the critical reading exercise. In constructing their literature review, Singer and Alexander excluded studies that focused exclusively on self-reports. We agree that self-reports are important but also limited in their usefulness: our study also examined performance data and annotation data. In particular, we believe that our novel methodology of counting and scoring student annotations represents a form of assessment that should be replicated and expanded. It seems to provide a more direct evaluation of the nature and quality of student engagement with the text. Combined with

performance data (e.g., measures of comprehension and retention), we are able to develop a much better sense of learner progress.

Finally, one result of our study, found in the attitudinal data, strikes us as especially provocative. One student's metacognitive reflection illustrates the way in which changes in attitude work hand in hand with critical reading practices and academic progress:

At first, I disliked highlighting and annotating in the electronic text. I missed having a pen in my hand. However, I surprised myself; I began to like reading from the e-text. It was easy to find passages to be on the same page as our classmates. I also found it easy to read over and track my annotations. Being able to type my annotations rather than write them gave me the leniency to write more than I would in a book. Typing all my thoughts helped me understand the text better because I could ask and answer my questions in a single note whereas in a real book, I would have to squeeze my comments into the tiny margins and would not be as thorough...Often, when I read a paper book, I have lots of questions, but lack of space to write them down let alone attempt to answer them. The slightly more difficult task of writing opposed to typing prevents me from writing down my thought process, thus hindering my understanding. Overall, I have really enjoyed using the e-text to read Plato and think my critical reading skills will improve as we continue with our other texts.

To be sure: this is just one's student's reflection. But we believe that it serves as an example of the transformative possibilities that are present here. We conclude with an analogy we believe is especially apt: a little over one hundred years ago, there were many who preferred the smell, touch, and relationship that one could build with one's means for transportation—the horse. And for a time, cars and trains struggled to compete with the horse, even for speed and ease of use. But for many today, the horse is less effective, impractical, or unavailable. It is our view that the same pattern will be repeated as electronic texts become more pervasive in academic environments.

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Career Exploration at an Appalachian University: Effectiveness and Pre-Existing Resources

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*Abstract: Many universities offer career exploration courses designed to assist students in making effective career choices; however, it remains unclear whether pre-existing resources have a significant influence on students' ability to benefit. The purpose of this study was (a) to measure the efficacy of a career exploration course at an Appalachian institution in improving college and career decision self-efficacy and (b) to determine if the following pre-existing resources, academic readiness, academic achievement, and familial financial resources, were significant predictors of post-test college and career decision self-efficacy scores. Participants were 127 traditionally-aged, undergraduate students at a private, Appalachian university enrolled in a 15-week career exploration course. Paired samples *t*-tests revealed a significant positive change from pre to post-test for college and career decision self-efficacy; however, hierarchical linear regression analyses revealed no significant influence of the pre-existing resources on post-test scores for either construct.*

Keywords: career, self-efficacy, academics, finances, preparation

Career exploration interventions have been implemented in higher education across many different types of institutions and student populations (Spitzer, 2000). Research has consistently demonstrated the effectiveness of face to face career interventions such as career exploration courses in improving a variety of outcome variables including career indecision (Peng, 2001), college self-efficacy (Hsieh, Sullivan, & Guerra, 2007), and career decision self-efficacy (Bollman, 2009; Komarraju, Swanson, & Nadler, 2014); however, the influence of pre-existing resources (i.e., academic readiness, academic achievement, and familial financial resources) on students' ability to benefit from career exploration interventions remains unclear. Although self-reported socio-economic status (SES) might be a predictor of response to some types of related intervention (Quon & McGrath, 2015), little is known about the influence of variables common in Appalachian contexts such as lack of academic readiness, lack of academic achievement, and lack of familial financial resources on the effectiveness of course-based career interventions.

Career exploration is widely accepted as a critical component of the overall career development process. The opportunity to explore one's self and the world of work contextually has been linked to many positive benefits including a stronger sense of vocational identity and improved career decision making (Gushue, Clarke, Pantzer, & Scanlan, 2006). Colleges and universities have utilized career exploration courses to increase student success in a variety of areas (Komarraju, Swanson, & Nadler,

2014; Spitzer, 2000) including career maturity and decidedness (Hardesty, 1991), career decision making (Fouad, Cotter, & Kantamneni, 2009), occupational engagement (Fouad, Ghosh, Chang, Figueiredo, & Bachhuber, 2016), career-related skills (Whiston, Sexton, & Lasoff, 1998), and career decision self-efficacy (Hansen & Pederson, 2012; Reese & Miller, 2006). Career exploration courses have also been found to be an effective means by which to reduce dysfunctional or negative career thoughts (Osborn, Howard, & Leierer, 2007; Reed, Reardon, Lenz, & Leierer, 2001). These types of interventions have been shown to be effective for diverse populations including students in Hong Kong, (Cheung & Jin, 2016), students attending mid-western community colleges (French, 2014), racially diverse first year students (Osborn, Howard, & Leierer, 2007), and students attending large, religiously affiliated universities (Hansen, 2016). Other more macro level benefits have also been demonstrated such as increased rates of retention, graduation, and academic performance (Hansen, 2016). Interventions typically utilized within career exploration courses include career assessments, exposure to resources, skill-building exercises, information about career tools such as resumes, and an emphasis on personal awareness (Brown et al., 2003). Although career exploration courses have been shown to have many positive benefits, one particular benefit that is well documented is an increase in various forms of self-efficacy (Bollman, 2009; Hansen & Pederson, 2012; Reese & Miller, 2006).

Appalachian Student Population and Pre-Existing Resources

When exposed to generalized career exploration opportunities, minority populations typically benefit and demonstrate increased goal selection and planning skills as a result of intervention (Blair, 2013). However, the idea that career exploration interventions should be developed and delivered through the lens of culture, given the unique perspectives and needs of various cultural groups, is also well supported (Aguayo, Herman, Ojeda, & Flores, 2011; Cheung & Jin, 2016; Leong, Hardin, & Gupta, 2010). Therefore, although career exploration courses might be effective in the general college population, little is known about the effectiveness of such interventions in rural, Appalachian contexts. First generation students and those from rural backgrounds may have unique needs and thus require unique interventions and resources that are not typically available through most university career development centers (Joslyn, 2016). Further, due to a lack of available models and resources, targeted interventions must be considered to connect specific Appalachian populations such as high school girls with specific career fields such as science (Kelly, 2016). In fact, students who are the first in their family to attend college are four times more likely to drop out than others (Engle & Tinto, 2008) and rural, Appalachian students are much more likely to be the first in their family to attend college than the average population (Ali & Saunders, 2006). Social Cognitive Career Theory (SCCT) variables such as self-efficacy beliefs, outcome expectations, SES, and perceptions of support have also been shown to predict significant amounts of variance in the college and career aspirations (Ali & Saunders, 2006, 2009) and post-secondary pathways of Appalachian youth (Ali & McWhirter, 2006). Therefore, because Appalachian populations typically face issues associated with rural geography, decreased access to resources, and first generation status and because the career development of Appalachian students might be significantly influenced by these social and environmental factors (Ali & McWhirter, 2006; Ali & Saunders, 2006, 2009; Kelly, 2016), it follows that the influence of these challenges on students' ability to benefit from intervention should be studied.

Academic Readiness. The academic readiness of students is one of the many unique challenges that Appalachian students and institutions might face. Ali and Saunders (2006) examined the effectiveness of college preparation efforts at rural high schools in Appalachia and found that students are not as academically prepared for college as their non-rural/non-Appalachian counterparts. Some reports have indicated that only 77.5% of students from rural high schools ever matriculate to high school graduation (Strange, Johnson, Showalter, & Klein, 2012) compared to a

national average of about 81% (Snyder & Dillow, 2013). Currently, only 22.6% of individuals age 25 years or older in rural Appalachia hold at least a bachelor's degree compared to the United States average of 29.8% (Pollard & Jacobsen, 2017). These social/environmental conditions create financial difficulties, reduce the number of available models (i.e., others who have succeeded academically and/or professionally), and set cultural norms that are not supportive of higher education (Ali & Saunders, 2006).

Academic Achievement. Academic achievement, or one's ability to produce successful academic outcomes, is another challenge that might influence Appalachian populations. The majority of college students who achieve academic success have high levels of learning, persistence, effort, and prior achievement (Bong & Skaalvik, 2003). The ability to achieve success is also influenced by a student's past Grade Point Average (GPA) and educational experiences (Fenning & May, 2013), support, in the form of familial, financial, or religious resources (Maton & Wells, 1995; Spitzer, 2000), SES (Hopkins, 2005), and self-efficacy (Bandura, 1986). Although students from rural Appalachian areas might display a strong drive to succeed academically, they might be limited in how much academic success they actually produce due to a variety of factors including the environmental deficits mentioned above (Hand & Payne, 2008).

Familial Financial Resources. The influence of a student's familial financial resources or SES on a variety of higher education outcomes such as physical and mental health of students (Quon & McGrath, 2015) and post-degree employment (Baldry, 2016) has been well documented. A connection has also been established between financial resources and various aspects of career development such as prevalence of negative career beliefs (Arulmani, van Laar, & Easton, 2003), inappropriate and unsupportive parental expectations (Zhang, Yuen, & Chen, 2015), and difficulty gaining admission into selective post-bachelor's training (Griffin & Hu, 2015). Subjective judgements of career potential might also be unduly influenced by SES, an assertion which further supports the broader claim that SES negatively affects self-efficacy on the whole (Kuncel, Rose, Ejiogu, & Yang, 2014). Given the varied and significant connections between financial resources and student success, the possibility that this variable might somehow moderate attempts to provide effective career intervention should be explored.

Self-Efficacy

Self-efficacy is the idea originally asserted by Bandura (1977) that one's belief in one's ability to accomplish a particular task will play a significant role in factors such as likelihood to attempt, potential for success, and evaluation of attempts. Students with high self-efficacy tend to show greater cognitive effort in tasks, increased motivation, and better self-regulation for course completion (Bandura, 1997). The concept of self-efficacy has also been expanded through SCCT (Lent, Brown & Hackett, 1994, 2000) to include one's beliefs about his/her ability to complete specific tasks such as those necessary to be successful in college (Solberg, O'Brien, Villareal, Kennel, & Davis, 1993) or make effective career decisions (Taylor & Betz, 1983).

College Self-Efficacy. College self-efficacy is the belief that one has the skills necessary to succeed in the college environment (Gore, Leuwerke, & Turley, 2005). Examples include tasks such as asking a professor for help, getting a date, or writing a paper (Solberg et al., 1993). College self-efficacy has been linked to a variety of factors such as students' perceptions of the campus environment (Jones, 2015), ethnic identity development, college adjustment (White, 2000), academic success (Wright, Jenkins-Guarnieri, & Murdock, 2013), GPA, educational goal setting (Garriott & Flores, 2013), and general persistence and performance (Gore, Leuwerke, & Turley, 2005). College self-efficacy has also been shown to be one of the strongest predictors of intent to persist through the first year of college, retention (Baier, Markman, & Pernice-Duca, 2016; Wright, Jenkins-Guarnieri, &

Murdock, 2013), and satisfaction with college (DeWitz & Walsh, 2002). More specific to career related issues, a belief in one's ability to succeed in college has been associated with early career development efforts (Wright, Jenkins-Guarnieri, & Murdock, 2013). Therefore, it follows that learning more about self and the world of work might help one feel more confident in his/her ability to succeed at college and an increase in college self-efficacy is a highly desirable outcome for intervention. However, little is known about this particular relationship, especially within Appalachian contexts.

Career Decision Self-Efficacy. Research has consistently demonstrated the role and importance of self-efficacy in relation to one's perceived ability to make career decisions (Betz & Klein, 1996). Based on Bandura's (1977) original concept of self-efficacy and extended into the realm of career-related behavior (Hackett & Betz, 1981), the construct of career decision self-efficacy refers to one's belief that he/she is able to make decisions related to the career development process such as summarize skills or utilize resources to search for jobs (Taylor & Betz, 1983). Confidence in leadership abilities along with a general sense of confidence in areas such as math and science are some of the most significant predictors of career decision self-efficacy (Paulsen & Betz, 2004). Other possible predictors include adaptive perfectionism (Ganske & Ashby, 2007), authenticity (Russon & Schmidt, 2014), and emotional intelligence (Jiang, 2016). Students who do not believe in their ability to make effective career decisions will experience higher levels of general indecision, lack of structure, and lack of confidence (Taylor & Betz, 1983). Higher levels of career decision self-efficacy have also been related to differentiated vocational self-concept, greater engagement with career exploration activities (Hargrove, Creagh, & Burgess, 2002), and stronger career decision making skills (Luzzo, 1993). Further, lower levels of career decision self-efficacy have been found in at-risk populations such as first-generation students (Harlow & Bowman, 2016). Therefore, because career decision self-efficacy seems to be such a critical aspect of the career development process and a desirable outcome in general, diverse students who complete courses in career exploration should be able to demonstrate an increase in this construct as a result of intervention.

Hypotheses

The purpose of this study was (a) to measure the efficacy of a career exploration course at an Appalachian institution in improving college and career decision self-efficacy and (b) to determine if academic readiness, academic achievement, and/or familial financial resources were significant predictors of post-test college self-efficacy and career decision self-efficacy scores. Thus, this study tested the following hypotheses:

- (a) A positive, significant change will be found in college self-efficacy from pre-test to post-test.
- (b) A positive, significant change will be found in career decision self-efficacy from pre-test to post-test.
- (c) When pre-test college self-efficacy is entered as a covariate, then academic achievement, academic preparation, and familial financial resources will all be significant predictors of variance in post-test college self-efficacy.
- (d) When pre-test career decision self-efficacy is entered as a covariate, then academic achievement, academic preparation, and familial financial resources will all be significant predictors of variance in post-test career decision self-efficacy.

Method

Participants

Participants for this study were 127 traditionally-aged, undergraduate students at a private, rural, Appalachian university. Each participant was enrolled in an elective, 15-week career exploration course during the fall of 2015 or spring of 2016 that covered topics such as self-exploration, leadership potential, understanding the world of work, and job search preparation. All participants were over the age of 18 and provided voluntary consent to participate. The sample was approximately 48% male and 52% female; between the ages of 18-34 with a mean age of 19; 64% first year students, 17% sophomores, 7% juniors, and 13% seniors; and 77.2% White, 11% Black or African American, 2.4 % Hispanic/Latino, 1.6% Asian, and 6.3% other. The average cumulative, college GPA of the sample was 2.92. The average ACT was 22.29 and approximately 54.3% of the participants were Pell Grant eligible. For the purposes of this study, the characterization of Appalachian was utilized broadly to describe the context and identity of the university rather than a demographic of individual students. However, according to the university's registrar, over 54% of students at the university identify with the term in some form including region of origin, cultural background, ethnicity, or descent (Dupier, personal communication, March 15, 2016).

Materials

Measures of Pre-Existing Resources. Academic readiness was measured by utilizing each student's ACT score as recorded in their official student record. The ACT is a standardized test typically administered in high school and designed to determine academic readiness for college. ACT scores are frequently utilized in college admissions decisions (Zwick, 2006). Although some have questioned the validity of ACT scores in predicting success (Fauria & Zellner, 2015) others have found it to be a significant predictor of grades and retention (Welborn, Lester, & Parnell, 2015; Westrick, Le, Robbins, Radunzel, & Schmidt, 2015).

Academic achievement was measured through GPA. GPA is widely accepted as a valid marker of academic achievement and is the standard scale most colleges use in order to rate a student's performance in course work. GPA was measured on a 4.0 scale (College Board, 2017).

Familial financial resources were measured by determining a student's Pell Grant eligibility status and coded as Federal Financial Aid (FFA). The Federal Pell Grant program is the nation's most extensive collegiate grant program providing funding for college students based on demonstrated financial need. Although there are basic performance requirements for maintaining a Pell Grant such as GPA and satisfactory academic progress, initial eligibility is determined based on financial need alone (Schudde & Scott-Clayton, 2016). Pell Grant eligibility has also been utilized in other studies as a general marker of financial resources (Bird & Castleman, 2016; Phillips & Herlihy, 2009).

College Self-Efficacy Inventory. The College Self-Efficacy Inventory (CSEI) was developed by Solberg et al. (1993) to measure college students' perceived level of ability to succeed in specific situations related to the tasks of college. The CSEI is a 19-item instrument and has an internal consistency of $\alpha = .93$ with three subscales: Course Efficacy, Roommate Efficacy, and Social Efficacy each with an $\alpha = .88$. Respondents are asked to rate their level of confidence in tasks such as, "Research a term paper; write course papers; or, do well on your exams." Each item is measured on a 10-point Likert-type scale ranging from 0 (not at all confident) to 10 (extremely confident; Solberg et al., 1993). Although some authors have suggested slight modifications to the CSEI in order to enhance reliability and validity, they also noted that most hypothesized relationships between the CSEI and related constructs were generally supported (Barry & Finney, 2009).

Career Decision Self-Efficacy Scale. The Career Decision Self-Efficacy Scale (CDSE) (Betz & Taylor, 2012) was originally developed by Taylor and Betz (1983) and known as the Career Decision-Making Self-Efficacy Scale. Currently, the CDSE has been revised to include both a long and short form (Betz, Klein, & Taylor, 1996). The CDSE is a 50-item measure with 5 subscales. It measures confidence in ability to complete major career decision tasks with an $\alpha = .97$ for the total score and a range of $\alpha = .86-.89$ for the subscales (Betz & Taylor, 2012). Example items include, “How much confidence do you have that you could: list several majors that you are interested in; use the internet to find information about occupations that interest you; or, make a plan of your goals for the next five years?” Each item is measured on a 5-point Likert-type scale ranging from no confidence at all, very little confidence, moderate confidence, much confidence, to complete confidence. The CDSE has been shown to have strong reliability and validity in a variety of contexts and is frequently utilized as a pre/post measure for evaluation of career interventions (Betz & Taylor, 2012).

Procedure

The lead investigator or graduate assistant visited each section of a 15-week career exploration course at a private, rural Appalachian university during week two of the class in both fall and spring semesters to obtain informed consent and a general demographics questionnaire, administer the CSEI, and provide instructions for accessing the CDSE online. Students were advised that participation is voluntary and that they would receive an informational presentation on career decision making and self-efficacy at post-test regardless.

The lead investigator or graduate assistant then returned to each course section during week 14 of the course in both semesters to administer post-test versions of the instruments including the CSEI and the CDSE and provide the informational presentation. The lead investigator then collaborated with an institutional administrator to gain access to GPA, ACT, and FFA eligibility for all study participants. The data was then coded, matched, de-identified by using a participant number, and analyzed utilizing SPSS version 24.

Results

Initial analyses included descriptive statistics for all variables. Participants with missing CSEI or CDSE measures were eliminated from the study.

Paired samples t-tests showed a significant increase in CSEI scores from pre-test ($M = 7.33$, $SD = 1.04$) to post-test ($M = 8.12$, $SD = 1.16$), $t(126) = -7.75$, $p < .000$. Paired samples t-tests also revealed a significant increase in CDSE from pre-test ($M = 3.92$, $SD = .60$) to post-test ($M = 4.11$, $SD = .62$), $t(126) = -4.16$, $p < .000$.

A hierarchical linear regression analysis was conducted with pre-test scores entered into step one as a covariate. The variables of ACT, GPA, and FFA eligibility were entered into step two as predictors of career decision self-efficacy. Semi-partial correlations were examined for each predictor variable, and none of the variables predicted significant variance in post-test scores (see Tables 1 and 2).

Discussion

Analyses revealed a statistically significant improvement in participants' college and career decision self-efficacy from pre to post-test supporting the career exploration course as an effective intervention at the target institution. In addition, ACT, GPA, and FFA eligibility were not significant predictors of

the variance in post-test scores for college or career decision self-efficacy, suggesting that career exploration courses might influence students indiscriminately, regardless of pre-existing resources. This finding provides evidence to support the use of this intervention for every student, as individual differences in academic achievement and socioeconomic status—which are variables usually associated with greater academic self efficacy—do not play a role in the impact of career exploration intervention.

Although this result was a disconfirmation of study hypotheses, the implication is generally a positive one that includes greater institutional and policy support for career exploration courses, especially at rural, Appalachian universities. First, diverging from the common practice of only requiring at-risk or under-prepared students to complete career exploration courses, this research supports the assertion that all college students could benefit equally and thus should be required to complete a career exploration course. Second, academic departments may consider creating their own career exploration courses or non-credit bearing interventions. These interventions could target similar skills such as career decision self-efficacy, but from the perspective of a student who may have selected a major but is still unsure about a particular career path. Given the demonstrated effectiveness of career exploration interventions, all faculty members should consider ways to assist students in carrying out the tasks of translating education to the world of work and avoid delegating this task solely to student affairs or offering intervention only to students who are undecided.

Although the scope of this study does not include an analysis of exactly how or why the course achieved such an indiscriminant influence, a potential explanation is that self-efficacy is a pliable construct that can change relatively easily with effective intervention regardless of pre-existing resources. Perhaps the skills taught and experiences gained during the course are universally applicable enough to be influential for students regardless of their academic readiness, academic achievement, and/or familial financial resources.

Limitations

Limitations of the current study are related to the small sample size and the absence of a comparison group, leaving the changes in post-test scores open to the effects of history and/or maturation. Future studies focusing on this same topic and population should seek to increase the participant total while remaining within the target institutional context and add a comparison group of similar students at a similar institution or perhaps within the same institution.

Another limitation to consider is the limited scope of the participant pool in general. Although the aim of this study was to test the effectiveness of a career exploration course at the particular target institution, the results might not be generalizable to other institutions with different demographics or even those with similar demographics. Therefore, even though broad generalizations across institutions might not be warranted at this time, a continuation and expansion of this research within unique populations is clearly supported, especially those that might be under-resourced or under-prepared. Implications for higher education institutions in general include exploring the possibility of adding career exploration courses as a requirement vs. an elective, thus exposing all students to the intervention as opposed to just those identified as undecided or at-risk.

A final limitation is that the characterization of Appalachian was applied broadly to describe the university's context and history rather than a demographic of individual students. The term is difficult to apply as an actual demographic variable as its meaning can be varied and open to interpretation. Future research should attempt to fully operationalize the term and then collect data from those who identify with the operational definition that is utilized (i.e., region of origin, culture, ethnicity, or descent.)

Future Directions

In addition to those previously mentioned, future directions also include an expansion of the dependent variable in order to ascertain what, if any, additional effects career exploration courses might have outside of self-efficacy related variables. Possibilities for additional effects could include influence on leadership skills, ambiguity tolerance, vocational identity, or influence on/interaction with other variables such as religiosity or major decidedness status.

Finally, although this study found the influence of pre-existing resources on students' response to intervention to be insignificant, future research should continue studying these variables as possible moderators between established relationships relevant to college and career success. This research becomes even more critical when considering the increasing number of students entering college with a variety of social, emotional, and cognitive stressors (Kadison & DiGeronimo, 2005) as well as academic under-preparation in critical subjects (Combs et al., 2009).

Conclusion

Overall, the assertion that career exploration courses are an effective way to increase students' sense of self-efficacy for college and career decision making was supported. In particular, the idea that this type intervention is effective for students at the rural, Appalachian target institution was also supported. Perhaps most important though was the non-significant finding involving pre-existing resources as a moderator for potential response to intervention. Therefore, although it remains well established that under-prepared and under-resourced students have unique needs, it is encouraging to know that the lack of resources these students face might not significantly deter their ability to benefit from various forms of intervention and that even well-prepared and resourced students might also benefit. The implication is then that institutions of higher education continue to offer and support career exploration courses and consider ways to increase participation from students regardless of pre-existing resources.

Appendix

Appendix 1. Hierarchical Linear Regression Model for CSEI Post-Test on ACT, GPA, & FFA

	R	Rsq.	Rsq. Δ	β	semi-partial r	p-value
Model 1	.45	.21	.20			
CSEI Pre-Test					.45	<.001
Model 2	.46	.21	.007			
ACT				-.05	-.04	n.s.
GPA				.06	.06	n.s.
FFA				-.06	-.06	n.s.

Note: Federal Financial Aid (FFA) Eligibility Status: 0 = No, 1 = Yes

Appendix 2. Hierarchical Linear Regression Model for CDSE Post-Test on ACT, GPA, & FFA

	R	Rsq.	Rsq. Δ	β	semi-partial r	p-value
Model 1	.66	.44	.44			
CDSE Pre-Test					.66	<.001

Model 2	.67	.44	.004			
ACT				.01	.01	n.s.
GPA				-.02	-.02	n.s.
FFA				.06	.06	n.s.

Note: Federal Financial Aid (FFA) Eligibility Status: 0 = No, 1 = Yes

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“There is no escaping it”: Graduate Student Conceptions of Environment and their Implications for Learning Motivation and Public Health Curricula

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Abstract: This manuscript stems from observations the authors made while teaching an environmental health course, which is part of a Master of Public Health (MPH) degree. Observations of student attitudes and patterns in course feedback prompted questions about how to pique interest in the course content. There has been considerable research attention given to the role of motivation in student learning and performance outcomes. How student motivation is generated, sustained, and impacted by educational curricula has inspired the development and revision of different theoretical models designed to explain these relationships. But the literature on adult professional learner motivation is less robust, which is important because adult learners enter classroom settings with academic and experiential knowledge. All of the existing theories of learning motivation build upon the assumed premise that students perceive the subject matter in a certain way. For adult, professional degree-seeking students in any field, however, the motivation to learn is contingent upon their preexisting conceptions of the course material—its value, relevance, and application to future career goals. Therefore, better understanding of this basis for learning in adults is important. We explore the ways in which entering MPH students conceive of one component of public health education in order to structure the course to maximize student motivation. The implications of our findings for educators in other professions are discussed.

Key words: student motivation; Transformative Learning Theory; public health; adult learning; professional education and training

Introduction

This manuscript stems from questions about adult motivation to learn prompted by observations the authors made while teaching an environmental health course which is part of a Master of Public Health (MPH) degree. A MPH is the professional practice degree for those people whose focus is protecting and promoting the health status of the population. Public health workers hail from many disciplines of origin, and the MPH degree aims to build applied scientific skills and channel disciplinary worldviews toward assessment, planning, monitoring, coalition and partnership development, management, leadership, communication, policy development, and cultural humility in service of the prevention of disease and injury, and the prolonging of life (APHA, 2017; WHO, 2017). Environmental public health—a core area of public health—focuses on the relationships between the environment and human health; many diseases and injuries are initiated, promoted, sustained, or stimulated by environmental factors. Conversely, environments may also promote better states of health.

Course context and overview

Students in MPH programs generally choose a concentration in one of the core areas of public health (i.e., Environmental Health, Epidemiology, Health Policy & Management, or Social & Behavioral Sciences), but must still be exposed to core principles of each area. The course addressed here serves that core function in our program. It is in many senses a survey course, structured in three sections: (1) environmental determinants of population health status, (2) fundamental assessment tools, and (3) strategies for solving environmental health problems and pursuing health equity. Students learn to consider health-relevant components of several types of environments: The ambient environment (i.e., air, water, soil), the built environment (e.g., housing and other buildings, physical infrastructure such as sidewalks and roads), the occupational environment (i.e., places people work), and the social aspects of environment present in any of the former ones. The course also addresses the fact that much of prevention in environmental health must curtail human activity which pollutes the environments we occupy. The sections of the course are woven together by a multi-part assignment in which students choose an environmental health concern, describe and analyze it, and propose ways to address the problem using disciplinary tools; this assignment is intended both to build systematic analysis skills as well as promote a systems view of environmental public health.

Regardless of the disciplinary concentration a student chooses, understanding the relationships between the environment and the health of populations is fundamental to addressing any public health concern. Across specific course learning objectives, the major instructional goal is that students come to see the necessity of examining the contribution of environments in any public health concern, and learn systematic processes for doing so. This goal notwithstanding, over the course of several semesters, the instructor observed trends in the ways students interacted with, sought to understand the material, and responded to the course:

- (1) Seemingly narrow perception of the environmental health discipline;
- (2) Apparent apathy toward environmental components of the broader public health field;
- (3) Consistently lower "relevance to discipline" and "stimulated to learn more" than other scores received in end-of-term course evaluation feedback.

These observations prompted the study described here.

Student motivation & learning

A review of the literature indicates a considerable interest amongst the scientific community regarding the role of motivation in student learning and performance outcomes. How student motivation is generated, sustained, and impacted by educational curricula has inspired the development and revision of different theoretical models designed to explain these relationships.

Early models of academic achievement and motivation characterized student goals as being either (1) mastery or (2) performance oriented (Ames & Archer, 1988; Dweck, 1986). Others posited that motivation could be calculated as a product of motive, expectancy, and incentive (Atkinson & Feather, 1966). More recent revisions—such as those to Achievement Motivation Theory—however, have proposed a third goal orientation termed "academic alienation" (Archer, 1994). Students who approach learning with an academic alienation mentality do so with the notion that their interests lie outside of the classroom. Consequently, these students are not motivated to master the material nor demonstrate their abilities. Rather, alienated students aim to fulfill course requirements with minimal effort, concentrating their ambition elsewhere (Archer, 1994).

Another more recent and widely employed explanation of student motivation stems from Self-Determination Theory (SDT) (Ryan & Deci, 2000). According to SDT, student behavior is determined

by the type of motivation s/he experiences relevant to the given behavior. Ideally, students are intrinsically motivated to be engaged with their coursework, driven by an internal source of inherent interest in the materials/activities. More commonly, however, students are motivated extrinsically, driven to engage in behaviors only by external demands (e.g., punishment, reward). It is also possible for students to experience no motivation at all (i.e., amotivation).

Despite the substantial body of research supporting the conceptualization/application of the aforementioned theories, it is pertinent to note that the majority of literature on student motivation has been developed around the experiences of child, adolescent, and undergraduate learners. Research on the role of motivation in student learning and performance outcomes amongst adult learners is far less robust, but nonetheless deserving of equal consideration. This may be especially true given the combination of shifts to a globalized, service-based economy, rapid technological change, and demographic imperatives (i.e., retirement of Baby Boom generation) which prompt adults to seek new or refined perspectives and skills.

Adult learners & academic motivation

Unlike undergraduate student populations, individuals pursuing an MPH are adult learners who already have a bachelor's degree and are eligible for employment. Further education is sought, then, not to simply "get a job", but to increase mobility within one's current field or to enhance one's qualifications toward a higher level of career attainment (Rothes, Lemos, & Gonçalves, 2014). The term andragogy, coined by Alexander Kapp in 1833, is used to refer to the education of adult learners and its unique demands. Andragogy has since been popularized by Malcolm Knowles, whose research characterizes adult learners as self-directed and task-oriented (Knowles, 1984; Knowles, Holton, & Swanson, 2015).

The literature on andragogy suggests that adult learners differ from their undergraduate counterparts in their motivation to learn: what motivates them, why, and how. Unlike undergraduates, research indicates that adult learners adjust their decision-making processes to navigate between academic and professional relevance (Hegarty, 2011). Instead of approaching learning with the singular goal of mastering course content, these students also must take into account whether or not the material at hand will be applicable to their current and/or desired field of employment. Knowles (1973) postulates that adult learners approach coursework based on its "immediacy of application", prioritizing the materials that they deem relevant to their own careers—current or anticipated. These findings call into question the longstanding assumption that adult learners are innately “volunteers for learning”, suggesting that their motives may instead be rooted extrinsically (e.g., higher pay, job promotion) (Carre, 2000; Rothes et al., 2014).

Additionally, the literature suggests that adult learners are largely influenced by their prior experiences to a much greater degree than their adolescent (or even undergraduate) counterparts. Transformative Learning Theory posits that learning occurs only within an individual's "frame of reference", defined by Cranton (2000) as “complex webs of assumptions, expectations, values, and beliefs that act as a filter or screen through which we view ourselves and the world” (Mezirow, 1997; Mezirow & Taylor, 2009). Adult learners are especially prone to approach new information through preconceived knowledge. Their motivation to learn, then, is largely contingent on what they believe they already know. Applying this theory to the present population of interest would suggest that public health students enter into the core environmental public health course with a preexisting idea of “what environmental public health is”—and by that subjective definition—whether or not the course content is applicable to their professional goals.

The tendency of adult learners to “filter out” information that they (1) already know or (2) deem irrelevant, however, is inherently problematic in that students could potentially be approaching

coursework with an erroneous foundation of understanding. The literature categorizes these preconceived ideas as either "misconceptions" or "alternative conceptions". Misconceptions are defined as "misunderstandings which have probably occurred during or as a result of recent instruction" (Griffiths, Thomey, Cooke, & Normore, 1988). Alternative conceptions are more firmly rooted, having developed and endured over a longer period of time (Griffiths et al., 1988; Zoller, 1996). In theory, alternative conceptions may be most relevant to adult learners whose knowledge accumulated through professional experience does not necessarily reflect the learning objectives of a formalized academic curriculum.

In summary, all of the existing theories of learning motivation build upon the assumed premise that students perceive the subject matter in a certain way. For adult, professional degree-seeking students in any field, however, the motivation to learn is contingent upon their preexisting conceptions of the course material—its value, relevance, and application to future career goals. In order to address the attitudes and performance of our students, then, we needed to know how they are perceiving the subject matter. To understand how our students defined "environment", our data collection method was rather straightforward: we simply asked them.

Methods

Participants

All students who enrolled in the environmental health core course between fall semester 2015 and spring 2017 were potential participants. Table 1 shows the variety of undergraduate studies that students reported upon entry to the Master of Public Health or Public Health Certificate in years coinciding with our data collection. At the time of entry, fully 90% of those students opted for a concentration other than Environmental Health Science (10%). Most entering students (52%) held Bachelor of Science undergraduate degrees (data not shown). Natural sciences and pre-health, health sciences, or nursing majors predominated. Overall, about 15% of entering students also reported having some other post-graduate study (data not shown).

Table 1. Undergraduate Area of Study for Incoming MPH and Certificate Students, 2014-16.

Undergraduate Area of Study	Count*
Natural Sciences	77
Social Sciences	39
Humanities	22
Education	3
Engineering	4
Pre-Health Professions/Health Sciences/Nursing	54
Pre-Professions/Non-Health	12
Other/Interdisciplinary	7
Public Health	9
Unknown	3

* Count refers to number of degrees, not number of students; therefore total is greater than the total number of students

Data collection

As a first class activity, students described what they understood to be the subject of the course through the following untimed writing prompt:

How would you define "environment"? Keep in mind that we are not looking for any particular answer or a certain "right" answer. In fact, we each likely have a slightly different definition for this word, and that's okay. Tell us about *your* definition.

To prompt participation, the assignment was graded on a completion/non-completion basis.

Analyses

Data were transferred verbatim to Excel spreadsheets for analyses, which followed the general inductive analytic approach described by Thomas (2006), useful here because we aimed to work toward a model to understand student motivation in future research. Our procedure was iterative, involving multiple phases of code development, application to data, discussion, and refinement of our code list.

When data collection was finalized, both authors performed an initial read-through of all data and KLC developed an initial code list which contained general and sub-codes and examples from the data for each. The initial code list contained descriptive codes, where an analyst-developed label is applied to pieces of data, and causal codes, where the code denotes that the data suggest one thing influences another (e.g., the code HUMAN INFLUENCE ON ENVIRONMENT labeled pieces of data where students indicated that human actions impacted environments). After discussion toward achieving mutual understanding of this preliminary code list, each analyst independently used it to apply the codes to a sub-set of the data. They then compared their application of the codes to the data sub-set. In cases of disagreement, discussion to consensus led to one of three outcomes: (1) revision of the code and its definition; (2) development of a new code; or (3) revision of the code applied to the segment of text. In addition, this phase served to assess the structure of the code book. For instance, while simultaneous coding (application of more than one code to the same section of text; Miles, Huberman & Saldaña, 2014) was allowed throughout analyses, if too many codes were applied to any given section of text, making interpretation untenable, then this might signal that the code book needed to be revisited (Miles, Huberman & Saldaña, 2014).

Both analysts then used the revised code book to apply codes independently to all data. After this phase, another round of discussion identified the need for one additional code, and for modification of another. Following this discussion, both coders re-coded all data using the finalized code book, which contained descriptive researcher-developed, causal, and in vivo (i.e., derived from the actual words used by respondents) codes. The results of independent coding were compared; remaining differences in coding were resolved through discussion to yield a final coded data set.

Next, one analyst (KLC) developed pattern codes by clustering together codes which had something in common, considering the meaning they had as a group. We then used brief narrative descriptions to describe the relationships among the codes and the larger patterns we were seeing. Through discussion, we assessed these clusters for what we believed held them together; sometimes, this cluster highlighted a larger theme or category which deepened our analyses as we wrote to explain themes we saw to each other (Miles, Huberman & Saldaña, 2014). Throughout, both analysts used analytic memoing as they applied codes to track ideas and insights. For instance, after the first round of applying codes to all data, we noted that two codes, FIXED and MULTIPLE ENVIRONMENTS, often co-occurred, leading to a brief discussion about what might be behind that. In another example,

we noted that students very frequently began their answers with a very broad, vague topic sentence, and then further specified their answers. The memoing process allowed us to track possible insights and points for discussion.

Results

Our findings are organized into two sections. First, we describe the overall content and tone which characterized student responses: what they believed environment was, and how they described it. Next, we present two major themes which emerged from our analyses which reflect the ways in which students positioned themselves with regard to the environments they described. Throughout this section, code names are indicated in ALL CAPITAL LETTERS. Single quotes indicate a generality observed by researchers; double quotes indicate actual words or phrases used by students.

Student conceptions of environment

Many student responses were characterized by an umbrella/topic sentence, which was quite VAGUE or ALL-ENCOMPASSING. Vague responses were those that did not identify specific components of environment (i.e., "the world around us") or failed to elaborate on a broad concept (i.e., "external factors to an individual"). All-encompassing responses identified large, overlapping components of the environment (i.e., "the physical, biological, chemical, social and psychological surroundings and conditions"), commonly prefaced by "including..." or followed with "etc....".

All-encompassing topic sentences were usually followed by additional clarification which further specified components of environments and their characteristics. Many responses characterized either (1) the environment itself or (2) its contents/composition as having a spatial/tangible PHYSICAL existence. When applied to the environment, this idea was usually associated with terms like "space" or "surroundings" or "physical", and the "things" that occupied the physical space. For some students, this physical space was geographically stationary. Recurrent terms such as "place", "area", "space", and "location" were used in these responses to establish the environment as a concept anchored to a FIXED location. In keeping with the idea of a physical location, some student responses indicated the existence of more than one environment—often differentiated in terms of climate, geography, or other characteristics of place (e.g., desert vs. rainforest, urban vs. rural). Other responses which identified MULTIPLE ENVIRONMENTS defined environments based on scope (e.g., microscopic vs. global) or type (e.g., natural vs. man-made).

Presented in contrast to the "physical environment", SOCIAL environment was typically described in two ways: (1) people/friends/family/community are part of environment because they occupy its space or (2) people/friends/family/community represent an interactive component/layer that functions as a part of environment itself. This idea was most frequently used in conjunction with a description of other aspects of environment (e.g., "natural", "man-made") which, in conjunction, made up the larger/general environment. That is, no student responses suggested "environment" was purely social in nature. Another component suggested by students was that, in whole or in part, environment involved some aspect of "nature", coded as TREES AND ROCKS. Commonly cited components of this category were plants, animals, air, water, forests, rocks/geology, and soil. These words were often used as examples of "natural" or "pre-existing" aspects of the environment, presented in contrast to SOCIAL or BUILT components. The latter was most frequently used in conjunction with other codes. Many students presented the built or "man-made" environment as existing in contrast to the "natural" environment. In some instances, the built environment was combined with the natural environment to comprise the "physical" aspects of the environment, juxtaposing these facets with its social/cultural elements. Sometimes, students did not use the term

'built environment', but described its parts, such as sidewalks or buildings. Finally, though it was less described than social or built environmental components, OCCUPATIONAL space was mentioned by some students specifically as an environment, or, more frequently, as part of a short list of what an environment is (e.g., places where people "live, work, play").

Finally, a minority of students gave more concise answers which contained language that would typically be affiliated with the natural sciences (e.g., chemistry, biology, geology, ecology). Typically, these responses—coded as SCIENCE—described the environment as being composed of smaller, physical units (e.g., molecules, cells) or used scientific terminology (e.g., geosphere, biotic/abiotic, organic/inorganic, symbiotic).

Ideally, students beginning a degree in public health would have a basic appreciation of environments delineated in the course: the ambient, built, occupational, and social environments and their overlaps. While there were very few comprehensive answers of that sort, after an initial vague statement, many students did specify *some* of these environments or provide examples in a list-like manner followed by "etc." or "and other things". An example of a student response with this type of structure is: "Environment is our surroundings. It includes all livings (such as Trees, Animals, Parasites, Viruses, and etc.) and Also Non-livings (Such as Buildings, Factories, Cars, Airplanes, Trains, and etc.)". There are two ways that this finding could be interpreted:

1. Students have a thorough understanding of the various environments and merely listed the examples that came to mind. The "etc." often included in the initial umbrella statement represents a complex breadth of information—known to the students—that simply did not make its way to the paper.
2. Students have a less-than-thorough understanding of the environmental components they highlight, and merely listed the examples that came to mind. The "etc." represents a complex breadth of information—unknown to the students—that has yet to be learned/understood.

These possibilities are further illuminated by the themes identified, and will be considered more thoroughly in the Discussion section.

Human positionality

Theme 1: Influence vs. Imminence. A cluster of codes we used to describe human positionality vis-à-vis environments suggested how they saw the relationship between humans and their environments. Some responses described a reciprocal HUMAN-ENVIRONMENT INTERACTION. These responses recognized the environment's role in "shaping" human health and/or life outcomes. This code was applied to both physical effects (i.e., air pollution, water quality) and behavioral and social factors (i.e., learned health behaviors, socioeconomic status). The more PHILOSOPHICAL posed a relationship between humans and their environment, referring to the Earth as our "home" or a space in which we "thrive". Others defined environment as a component of one's "existence", expounding upon the interconnectedness between humans and their environment.

A more substantial portion of the responses, however, discussed the means by which the environment influences and shapes human life uni-directionally; some responses painted a grim picture of the environment and how devastating/limiting it can be to human life. In the most extreme cases, HUMAN DEPENDENCE ON THE ENVIRONMENT, though very infrequent, characterized the environment as something humans require for survival, indicating not just a relationship, but a dependency. In contrast, reflection about the HUMAN IMPACT ON ENVIRONMENTS or POLLUTION were not intensely present in our data. When pollution was

mentioned, it was often as simple as a phrase indicating that human activity can introduce pollution into environments; in general, answers did not indicate an understanding of complex relationships or systems of mutual influence nor interdependence.

Theme 2: Environment as being individually-focused. For many students, understandings of the environment might be described as person-centered or individually-focused. These students placed themselves, "an individual", or even sometimes "an organism" at the center of their framing of environment. In some cases, this sort of definition was fixed, as in: "Environment is the area or condition in which someone lives and operates"; "surroundings and forces that a living organism incurs in a particular place"; or "an organism's environment consists of where it is located, who it is around, and the climate of the area". In other cases, an element of time was included, as students framed environment as whatever was around a person at any moment in time. Unlike large-scale changes (e.g., climate change), these responses illustrated an individual's movement as being accompanied by the environment. These movements were described as occurring over the span of a day (e.g., home environment vs. work environment) or over the lifespan (e.g., childhood home vs. adult residence). That is, environment was still based around the individual, but as the individual moved through space and time, environment went with her. Definitions which referenced this sort of person-centered view included "any setting in which a person may find himself", "the place where the person currently is", and "environment is all around us, there is no escaping it".

The centrality of the individual in some cases included a person's emotional and sometimes cognitive experience of environment. These students described environment as having a "feeling" or "pace". Some of these views were quite abstract, as in: "energies, sounds, textures, colors, and overall presence", "perceived actions, thoughts, or ideas within that area", and "every 'person' is their own environment". In other cases, the emotional aspect was framed as positive or negative, as in environments which are "uncomfortable", "positive", "welcoming", or those which are framed in terms of response to others (e.g., "how friendly or hostile those around you are").

Discussion

In the Results section, we proposed that the vague topic sentence followed by a list of types or components of environments structure of many student answers suggested either that (1) students had an appropriately broad descriptive sense of environments upon entering the course which they partially summarized, indicated the rest of what they knew with "etc.", or that (2) they had partial understandings, wherein the "etc." symbolized a lack of concrete understanding and/or things yet to be defined. In light of the themes which emerged from our data, we believe the second possibility is the more likely one. If student conceptions of the complex interactions between humans and environments were broader and more nuanced, it is unlikely that the sense that environments 'happen to us' would be strongly present. Likewise, an ideally public-health mindset would not so clearly emphasize the individual, and would instead highlight population-level actions and impacts within environment-human systems. The nature of the question we posed to students, however, is that there are technically no "wrong" answers. Moreover, while we found no glaring patterns in factual incorrectness, our data do suggest that instructors must work to help students systematize and 'complexify' their understanding of (1) environments, (2) the components in them relevant to human health and well-being, and (3) the interactions between human activity and environmental states and conditions.

In contrast to less ambiguous learning concepts (i.e., mortality rates), student definitions of environment are expected to be subjective. A mix-up between "mortality" and "morbidity", for example, would constitute a student "misconception" that could be easily corrected in the classroom environment. Correcting a student's notion that the environment is beyond human influence,

however, requires an invalidation of his/her learned experiences. These firmly rooted understandings of "truth" uncovered in our data collection are better defined as "alternative conceptions", the remediation of which poses a formidable challenge to student learning (Griffiths et al., 1988).

This challenge has implications for the state of public health. One of the first and most fundamental concepts addressed in public health degree programs are levels of prevention, in which primary or "upstream" prevention (i.e., prevention of a challenge to health before it can manifest in any way, such as through vaccination) is the preferred option. In student responses, we noted an underlying theme of environmental health problems being out of the scope of human influence. Many students characterized the environment as something that determines human outcomes, but failed to discuss the fact that it is just as often human activity which changes environments to be less healthful. This not only means that (1) students may not be making the connection to systems and "upstream" human-created influence on environments (e.g., through pollution), but (2) it also suggests that they are positioning themselves as passive experiencers of environment. If students are to leave the program as active change agents in the service of public health, this perception is a fundamental one to change.

Implications

In reviewing the demographic makeup of our student body, we have found it to be fairly representative of a "typical" professional program. The majority of our students have already earned undergraduate degrees in the natural sciences and health professions, making them eligible for employment. We know from the literature that these adult learners likely have career-specific motivation for returning to school. And by asking our students how they defined environmental concepts before engaging in the coursework, we have gained better understanding of how they perceive the subject matter. It is now pertinent to discuss how our findings "fit" into the existing theories of learning we previously introduced.

Achievement Motivation Theory would suggest that our students—professional adult learners—may be "alienated" from their coursework (Archer, 1994). If a student vaguely perceives the environment as being "any setting in which a person may find himself", he may not recognize its application to his aspiring career in healthcare policy. Even students without firm professional agendas may fail to see how the environment fits into the broader scope of public health practice, especially if they perceive it as being "fixed" or "imminent". These alternative and/or misconceptions lead students to make inaccurate judgements regarding the material's "immediacy of application" to their professional endeavors (Griffiths et al., 1988; Knowles, 1973). In summary, learning theory would suggest that the disconnect we have observed amongst our students is not unprecedented. The "academic alienation" experienced by our students stems from the tendency of adult learners to only learn what it is they do not already know—even if what they already know is inaccurate.

Relevance to other disciplines

The challenges associated with educating adult learners are not unique to public health. There are a number of professional programs that operate in a similar manner to public health training. Any discipline that offers advanced credentialing, training, or licensure can expect to attract adult learners—people with some degree of real-life experience that they bring with them into the classroom. In order to better motivate these students, instructors must first acknowledge and address pre-existing conceptions of what students believe they (1) already know, (2) have yet to learn, or (3) what will be applicable to their intended career.

Future Directions

Transformative Learning Theory (TLT) (Mezirow, 1997) poses recommendations to educators who seek to meet this challenge in adult education. In order to "transform" the learner's perception of the subject matter, educators must present the concept in the context of his/her own life. Transformative learning also calls for educators to initiate and maintain a classroom environment in which students are free to be critical in their assessment of new knowledge, as well as their existing assumptions (Mezirow, 1997).

Putting TLT into practice involves strategically engaging students in learning activities that encourage students to (1) acknowledge their unique point of view and (2) reflect upon their assumptions in critical discourse. The incorporation of debates, either in small groups or with the entire class, are a commonly suggested strategy to encourage critical analysis and reflection. Similarly, self-reflection can be elicited using role-playing or simulations, either within or outside of the classroom (e.g., field trips, community-based projects) (Cranton, 2000). A critical component of these sorts of transformative activities is follow-up reflection, which can occur in the form of journaling, group discussion/debrief, or position papers.

The role of the educator in this endeavor is both pivotal and multi-faceted. First and foremost, the educator is responsible for creating a classroom environment—whether physical or virtual—in which students are comfortable recognizing and challenging their frames of reference (Brookfield, 1995; Taylor, 1998). Educators of adult learners must also be prepared to address the dissonance (or conflict) that emerges from confronting student conceptions (Saavedra, 1996; Taylor, 1998). Providing constructive feedback and guidance to adult learners requires an instructor who is not only “trusting, empathetic, caring, authentic, [and] sincere” but, further, acts as a “learning companion” to adult students in their process of transformation (Cranton & Wright, 2008; Taylor, 1998).

In order to address the disconnect we identified in our students' conceptions, then, we should consider modifying our classroom environment to be more conducive to transformative learning. As previously mentioned, the course under discussion is a core requirement of the program, which—to an extent—inhibits the flexibility with which it is structured. Within the program, core courses are required to address certain requisite competencies. That being said, there is a great deal of freedom afforded to faculty in terms of how those competencies are achieved. Encouraging students to pursue analytic assignments relevant to their career paths could be a means of encouraging the autonomy necessary to elicit transformative learning. TLT could also be applied through the restructuring of classroom interactions to be more challenging of student assumptions, prompting critical discourse on the meaning and significance of course content. The efforts made in this manuscript to better understand pre-existing student conceptions of course materials, although informative, should only be taken at face value for what they are: a first step in the direction of self-directed learning. Future application of these findings should be incorporated into the ongoing process of improving the educational methods used in our program to better reach its students.

Conclusions

Our data suggest that student conceptions of environment upon entering our Master of Public Health degree are partial, and lack a systems perspective on the interconnectedness of human activity, environmental states, and population health. Of course, arriving with an incomplete understanding of the subject matter is expected; students are not expected to fully comprehend the depth/scope of EHS on the first day of class. The extent to which students stay “locked in” to their pre-semester conceptions of course topics, however, may impede their motivation, engagement, and perceived significance of the subject matter in the larger scope of public health practice. Modifying these

conceptions is a key educational need for future practitioners whose aim is the prevention of unwanted health states related to the environments groups of people occupy. Transformative Learning Theory may provide an appropriate framework for modifying student conceptions of environment as they relate to public health.

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Case-based Perspective-Taking as a Mechanism to Improve Metacognition and Higher-Level Thinking in Undergraduate Speech-Language Pathology Students

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Abstract: This case study addressed the authors' efforts to design an 8-week small-group independent study (IS) experience that facilitated undergraduate speech-language pathology students' (n=19) higher-level thinking and overall metacognitive awareness. We hoped to encourage both in order to improve students' overall cognitive growth while enhancing their reflection about and knowledge of professional perspectives regarding the assessment and treatment of laryngeal cancer. To take on this challenge, we combined case-based learning (CBL) and perspective-taking (PT) pedagogies across the IS. Students completed the Metacognitive Awareness Inventory (MAI) pre- and post-IS, and written reflections after each of eight weekly discussion meetings. The MAI was quantitatively analyzed, while reflections were qualitatively coded using Bloom's taxonomy. Findings indicated that metacognitive awareness significantly improved and that higher-level cognitive processing was increasingly evidenced across students' IS experience. Results indicate the potential to maximize metacognition and cognitive processing by combining CBL and PT by the methods used here. Applications of combined CBL and PT to other disciplines and teaching and learning situations will be discussed along with the implications of our findings.

Keywords: Metacognitive awareness, case-based learning, perspective-taking, cognitive processing

Since the first work on active learning in 1991 (Bonwell & Eison), teaching pedagogies that involve learning through *doing* tasks versus *receiving* information have been firmly espoused by educational researchers and practitioners (Fink, 2013; Barkley, 2010). In particular, active learning represents a cultural shift away from the traditional lecture. Instead, classroom instruction is designed to facilitate experiential learning, followed-up by reflection on what was learned and how one is learning alone and with others (Fink, 2013). By setting up the classroom in this way, it is thought that higher-level learning and metacognitive awareness may be fostered (Richmond & Hagan, 2011; Vos and De Graaff, 2004).

Why metacognition?

Metacognition was first introduced by Flavell (1979) to describe self-cognitions, or thoughts about one's own thinking. It includes the subcategories of *knowledge* (knowledge about thinking in general

and one's own thinking) and *regulation* of that knowledge via cognitive strategies, etc. (controlling learning via activities that foster monitoring and controlling cognitions; Dunlosky & Metcalfe, 2009; Schraw, 1998). For example, metacognitive knowledge is linked to the following (Schraw, 1998; Schraw & Dennison, 1994):

- Declarative knowledge (knowledge of one's own cognitive skills or what one knows or needs to acquire to think through a topic)
- Procedural knowledge (understanding how one learns)
- Conditional knowledge (comprehension of different learning strategies and the ability to justify why one might use a strategy in a specific context)

On the other hand, metacognitive regulation involves:

- Planning (setting learning goals)
- Information management strategies (managing and processing information by classifying it or condensing broad concepts into succinct descriptions)
- Monitoring (evaluating the effectiveness of learning strategies used)
- Debugging strategies (using strategies to improve comprehension or correct misunderstandings or task errors)
- Evaluation (analyzing the success of learning strategies used, or the effectiveness with which one performs a task following the use of such strategies)

Thus, metacognitive regulation is often engaged in to attain some learning or behavioral goal. Goal attainment further calls upon self-regulatory processes related to attentional resources, impulse and emotional control, action maintenance, planning, and task performance (Vohs & Baumeister, 2004). Metacognition allows learners to critically evaluate and shape their future learning and behavior. Further, it is tied to strong learning gains and greater success on a range of cognitive tasks, better use and focus of attentional resources, and more precise self-evaluations of learning (Dunlosky & Metcalfe, 2009; Koriat, Ackerman, Locke, & Schneider, 2009; Prins, Veenman, & Elshout, 2006; Nelson & Dunlosky, 1991; Koriat & Bjork, 2006; Koriat, 2008; Schraw, 1998).

Metacognitive awareness describes having a clear understanding of one's own thinking such that metacognitive knowledge and regulation are supported and strengthened. Young & Fry (2008) found that junior and senior education undergraduate students who scored higher on a self-report measure evaluating metacognitive awareness and its subdomains of metacognitive knowledge and regulation (the Metacognitive Awareness Inventory (MAI); Schraw and Dennison, 1994), had better overall grade point averages (GPAs) than those who scored significantly lower on the MAI. Graduate education students scored significantly higher on the metacognitive regulation sub-section of the MAI, but demonstrated statistically similar performance on measures of metacognitive knowledge as undergraduate students. These findings indicate that more experienced students may have stronger strategies for regulating their cognitions (i.e. assessing test performance accuracy), and that metacognitive regulation (as opposed to metacognitive awareness) may be most facilitative of gains in learning and academic performance (Schraw, 1994). Similarly, Rum and Ismail (2014) found a strong correlation between the MAI and GPA of students enrolled in introductory computer programming coursework regardless of academic standing.

Greater metacognition and self-regulation are highly correlated with self-efficacy (Bartimote-Aufflick, Bridgeman, Walker, Sharma, and Smith, 2016) or the belief that one can take on a specific task (Bandura, 1977). In turn, self-efficacy exhibits a strong relationship with student learning

outcomes, further suggesting that improved metacognition and self-regulation may mediate increases in self-efficacy and vice-versa.

Schraw (1998) suggests that metacognition may be promoted by group discussion and activities which allow students to share and reflect upon their self-cognitions in relationship to specific content. This practice should effectively facilitate metacognitive skills and promote metacognitive awareness. After all, reflection requires the monitoring and evaluating of one's own thought processes for accuracy. Thus, engaging in reflection facilitates practice of metacognitive regulation. Further, by listening to how others evaluate their own thought processes, individuals with poorer metacognitive regulation may learn new and different strategies to control and monitor their own cognitions.

Higher levels of cognitive processing and metacognition

Bloom's taxonomy offers a specific way to differentiate higher levels of cognitive processing from lower ones (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956; Adams, 2015; noted below with an evolving example of the cognitive skills used at each level):

- Knowledge (labeling different parts of the brain on a 2-dimensional blank picture)
- Understanding (matching functional properties with each brain region)
- Application (predicting resulting symptoms from damage to a specific brain region)
- Analysis (interpreting case information to determine which brain regions are potentially injured based on cognitive, behavioral, and emotional patterns)
- Synthesis (identifying tasks that may determine the integrity of different brain regions)
- Evaluation (providing a rationale for or against the tasks noted above under Synthesis.)

Past research indicates that metacognitive knowledge and regulation improves when higher-level cognitive skills are used during learning. Reciprocally, more sophisticated metacognition is often noted when individuals are using higher-level cognitive skills; both of which ultimately result in improved learning (Chin & Brown, 2000; Magno, 2010). Higher-level cognitive processing is associated with what is known as a *deep* approach to learning, or a focus on understanding new material. By exploring relationships between concepts, prior knowledge, and personal experiences, as well as retrieving new information and applying it to situations, deep learning is expected to be facilitated (Biggs, 2003). A surface approach to learning is focused on knowledge (i.e. rote recall of information), the lowest level of Bloom's taxonomy. This approach does not emphasize deep understanding and making connections between other concepts, tasks, or experiences (Biggs, 1987; Chin & Brown, 2000). Given that deep approaches to learning (i.e. application, analysis, synthesis, etc.) are focused on meaning-making versus rote memorization of knowledge or facts, it is not surprising the metacognitive regulation (i.e. planning, information management, monitoring, debugging, etc.) would be necessary to support higher-level cognitive processes.

Promoting metacognitive awareness and higher-levels of cognition

While active learning includes any situation that facilitates engagement in experiences and reflection on those experiences, specific types of active learning pedagogies may be uniquely suited to promote metacognition and higher-level cognitive processing.

Case-based learning (CBL). CBL is an active learning instructional pedagogy that requires students to discuss and analyze real-life case scenarios from their discipline collaboratively and cooperatively. Students engaged in CBL are asked to describe their thinking process about case

features to a group (i.e. metacognitive knowledge; Trommelen, Karpinski, & Chauvin, 2017). Likewise, cases engage students in clinical reasoning which requires deep (higher-level) versus surface processing of information. Further, application of prior knowledge and understanding of a topic, and synthesizing, or evaluating cases to facilitate higher-level cognitive processing and metacognition are commonly targeted (Trommelen, Karpinski, & Chauvin, 2017). The implementation of CBL is tied to significantly better test performance from pre- to posttest when compared to lecture alone (Datta & Ray, 2016). Further, discussions surrounding cases may provide an opportunity for students to engage in cooperative learning, enhance emotional engagement with content to foster learning outcomes, and improve interactions between students in the classroom (Nkhoma, Sriratanaviriyakul & Le Quang, 2017; Foran, 2002).

Perspective-taking. DeBono's "Six Thinking Hats" (1985) is a strategic pedagogy that facilitates metacognitive awareness via a framework describing six different thinking processes. This pedagogy can be applied to the examination of cases, questions, or problems. The original iteration of this pedagogy tasked students with wearing colored hats to explicitly represent each of the six thinking processes DeBono described including:

- Presenting evidence about a given course topic (What do we know about this topic?)
- Questioning assumptions and/or challenging peers to think differently about a topic to generate alternatives or new ways of thinking about a subject (What are some creative ideas regarding this topic?)
- Advocating for the use/implementation/acceptance of the alternative(s) (What evidence supports the use of these creative ideas?)
- Challenging the use/implementation/acceptance of the topic being discussed (What are some potential concerns or problems with these ideas?)
- Expressing emotion to share positive, negative, and/or neutral feelings about a topic (What are the feelings or opinions about these potential alternatives?)
- Regulating and reflecting upon the results of the thinking processes discussed above (What are some conclusions or decisions that can be made about this topic? What else should be considered? How else can we think about this topic?)

By putting on different thinking hats (applying various thinking strategies) in parallel as a topic is discussed, metacognitive knowledge and practice of metacognitive regulation may be reinforced. In regards to knowledge, by approaching a particular topic or scenario in this way, students may gain a greater awareness as to what thinking strategies work best in particular situations as well as their own cognitive processes and habits. On the other hand, metacognitive regulation is put into practice by the "six hats" methods when student implement cognitive strategies, and monitor and evaluate those strategies.

These approaches may be explicitly assigned as a process like the example above. However, role-playing that involves students taking on the perspective of different stakeholders for a situation or problem may potentially facilitate using the "six hats" strategy implicitly. For example, asking students to think as if they were a doctor, nurse, speech-language pathologist, spouse, dietitian, psychologist, etc. when approaching a complex clinical problem is likely to lead to similar cognitive processes, based on each stakeholder's unique point of view. As a result, students may integrate many different perspectives into how they might manage the scenario in question.

Such a strategy is likely to lead to students sharing their own thought processes which may further their own and other group members' metacognitive knowledge and regulation. Likewise, perspective-taking (PT) likely requires students to not only engage in metacognition, but also higher-

level cognitive processing by using baseline knowledge and understanding to apply, analyze, synthesize, or evaluate the targeted problem or idea based on an assigned role. Finally, there is evidence that such a strategy may allow students to practice facilitating effective communication and empathy that may be especially important during students' future work (Vescio, Sechrist, & Paolucci, 2003; Galinsky & Ku, 2004). Facilitating empathy via PT has been known to have real world consequences such as greater patient satisfaction (Blatt, Lelacheur, Galinsky, Simmens, & Greenberg, 2010).

Learning scenario

One challenge of working with undergraduate students studying clinical professions involves facilitating their higher-level cognitive processing of disciplinary content and overall development as learners via improvements in metacognition. For example, we believed there was a crucial need to expose undergraduate Communication Sciences and Disorders students to the multidisciplinary assessment and management of laryngeal cancer while facilitating metacognitive development and higher-level (deep) learning and cognitive processing. Our approach to accomplishing these objectives was to combine CBL and PT into a case-based perspective-taking (CBPT) pedagogy during an 8-week small-group learning experience. As detailed above, it is likely that CBL and PT foster both metacognition and higher levels of cognitive processing separately. Thus, we hoped that implementation of CBPT would result in global improvements in metacognition and deeper processing of disciplinary content for students across an 8-week learning experience. We chose to examine the effectiveness of CBPT via the following research questions:

1. Will students' metacognitive awareness significantly increase from pre- to post- learning experience?
2. Did students' learning change across the experience such that a trend towards higher-level cognitive processing was reflected?

Methods

Context of learning experience

Nineteen students participated in 8-weeks of discussion-based activities as part of an independent study (IS) focused on the interdisciplinary management of laryngeal cancer. Seven students participated in the IS experience in the fall of 2016 while the remaining students completed their IS in the spring of 2017. IS content and procedures were identical across both semesters. All participants were female undergraduate speech-language pathology majors. The IS experience was facilitated by two faculty members (first and second author of this paper) and one graduate assistant who had previous exposure to various topics across the IS experience. The IS was not a required element of any student's plan of study; however, students did earn variable, elective credit (1-3 credits) for their efforts and participation.

While participating in the IS, students met with one or more facilitators for weekly one-hour discussion sessions. Students prepared for each IS session by completing pre-selected readings from an assigned text (Author & Author, 2017). During IS meetings, facilitators introduced a series of CBPT activities related to the content of their assigned readings. These activities required that students discuss specific clinical cases by taking on the perspectives of various stakeholders important to the management of laryngeal cancer (e.g., patient, family, doctor, psychologist, employer). An example of one CBPT activity used as part of the IS experience can be found in Appendix A.

Following each weekly meeting, students completed reflections on their learning, specifically in relationship to the topic of discussion for each week, as well as general insights about the management of laryngeal cancer. Five questions were provided to students to structure these weekly reflections:

1. After completing my readings and participating in IS activities, what important insights have I noted?
2. What questions do I have about this material after reading/participating in discussion?
3. Did I find this material interesting? Why/why not?
4. What information conflicted with my own experience/perspective?
5. How did our discussion/activity this week impact my learning?

Students submitted reflections electronically to the week's facilitator, who then provided responses to each student's reflection to answer questions, and acknowledge students' perceptions of their learning.

Data collection & analysis

Data were harvested from a variety of sources to better understand the impact of CBPT on student learning and metacognition. Weekly student reflections served as one data source. Students also completed the MAI and all nine sub-sections constituting metacognitive knowledge (declarative, procedural, and conditional knowledge) and regulation (planning, information management strategies, monitoring, debugging strategies, evaluation; Schraw and Dennison, 1994) prior to the IS experience and following its completion.

Data were analyzed qualitatively and quantitatively to determine the impact of CBPT on student learning. MAI data were analyzed quantitatively to measure changes over time in terms of students' metacognitive awareness. Weekly reflection data for each participant were analyzed qualitatively, using a categorical approach to analysis to identify any changes in the levels of cognitive processing observed across the IS experience.

Quantitative analysis. Of the 19 participants involved in the IS, data for students' pre- and post-IS experience, MAI was used for 18 of the 19 students, as one student only provided post-MAI data. Due to the small sample size, a Wilcoxon signed-rank test was used to determine whether significant differences were found from pre- to post-IS experience overall, in terms of metacognitive knowledge, metacognitive regulation, and the specific sub-components of these processes. Alpha level was set at .05.

Qualitative analysis. A verbatim transcript from each participant's weekly reflections was used to measure levels of cognitive processing. To accomplish this task, reflection data were analyzed using Bloom's Taxonomy (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956). Analysis via Bloom's was meant to identify changes in the complexity and consciousness of thought, as both underly cognitive growth (Author, 2012; Maslovaty, Cohen, & Furman, 2008). To understand changes in higher-level thinking across the IS experience, transcripts from week 1, week 4, and week 8 of the IS were reviewed by the third author of this study, who applied the six categories of Bloom's taxonomy (knowledge, comprehension, application, analysis, synthesis, evaluation) to reflection data. Authors agreed that as changes in higher-level thinking occur incrementally, analyzing the first, middle, and last weeks of student reflection data was appropriate. Across all transcripts, these categories were assigned to describe changes in the levels of cognitive processing observed across the IS experience.

Inter-rater agreement for the qualitative analysis of reflection data was measured as follows: A random sample of data points per transcript were also coded for level of cognitive processing by the first and second authors and compared to the initial analysis completed by the third author. Over 90% agreement was found across raters. In instances where differences in assigned codes/categories were identified, authors discussed each until consensus was reached.

Table 1: Pre- & post-IS MAI data

	Pre-IS mean (SD)	Post-IS mean (SD)
Declarative Knowledge	7.44 (.71)	7.67 (.77)
Procedural Knowledge	3.67 (.49)	3.72 (.46)
Conditional Knowledge	4.44 (.62)	4.67 (.59)
Overall Knowledge of Cognition	15.56 (1.19)	16.06 (1.21)
Planning	5.28 (1.44)	6.11** (1.10)
Information Management Strategies	8.67 (1.03)	9.0 (.91)
Comprehension Monitoring	5.83 (.86)	6.11 (1.18)
Debugging Strategies	4.89 (.32)	4.94 (.24)
Evaluation	4.61 (1.09)	5.28 (1.10)
Overall Regulation of Cognition	29.28 (3.3)	31.44** (3.3)
Total MAI Score	45.11 (4.28)	47.50** (4.25)

**($p < .05$)

Outcomes

MAI data

A Wilcoxon signed-rank test determined that there were statistically significant increases in students' MAI scores for only the regulation of cognition section from pre-IS (Mdn=29.5) to post-IS (Mdn=32, $z = -2.28$, $p = .022$), but not for the knowledge of cognition section (pre-IS, Mdn=16 and post-IS Mdn=16, $z = -1.59$, $p = .11$). The planning sub-section of the MAI regulation of cognition section significantly increased from pre-IS (Mdn=5.5) to post-IS (Mdn=6, $z = -2.66$, $p = .008$), as did total MAI scores from pre (Mdn=46) to post (Mdn=49, $z = -2.18$, $p = .029$). No statistically significant findings were noted for the remaining eight sub-categories of regulation and knowledge of cognition. See Table 1 for pre- to post-IS mean scores by MAI category.

Levels of cognitive processing

While the analysis described above allowed investigators to better understand the various forms of learning experienced by students across their IS experience, it did not yield information about changes in cognitive processing. Analysis of students' reflections using Bloom's taxonomy identified changes in the complexity of cognitive processing, with more reflection statements indicating low-level cognitive processing early in the IS experience. For example, one student indicated understanding *"more about the different surgical and treatment approaches that can be taken when a patient is diagnosed with laryngeal cancer"* following an early IS discussion. This statement demonstrated the cognitive processing level of *knowledge*. Another student demonstrated the cognitive processing level of *comprehension* when she noted that *"every person on the care team plays a big role when it comes to supporting the patient."*

A move towards higher-level processing of core material was noted towards the end of the IS experience. For example, application was demonstrated in the following: *"I was able to connect this to a broader point of view that it is important for a patient to have support in his/her environment no matter where they turned,"* while another student's reflection was coded as analysis: *"I feel if a patient has some aspect of his/her life that will remain constant, such as family, friends, or community, that he/she will be able to look at things with a slightly healthier outlook."* One student noted the highest level of cognitive processing in this study (synthesis) when she indicated, *"perspective-taking exercises increased my ability to consider so many angles and helps me practice thinking about others' opinions and thoughts, something that will be important as a future clinician to be able to counsel patients on their individual concerns."*

Table 2: Frequency table for levels of cognitive processing data

	Week 1	Week 4	Week 8
Knowledge	227	152	113
Comprehension	48	70	114
Application	16	18	76
Analysis	1	14	35
Synthesis	0	2	15
Evaluation	0	0	0

While the greatest number of reflection statements demonstrated knowledge-level learning (n=492), 50% fewer knowledge statements were observed in week 8 than in week 1, demonstrating an overall decrease in this lowest level of cognitive processing. The remaining levels of cognitive processing measured (comprehension, application, analysis, and synthesis) increased from week 1 to week 8, indicating that while the lowest level of learning (knowledge) decreased over time, higher levels of cognitive processing were consistently observed as the IS timeline progressed. No instances of the highest level of learning (evaluation) were noted at any point across weeks 1, 4, or 8 (see Table 2).

Discussion

Overall, it appears that the use of CBPT may have facilitated gains in metacognitive awareness and increases in higher-level cognitive processing of core content knowledge. Specifically, reflective statements across two cohorts of students from week 1, to week 4, to week 8 of the IS increasingly exhibited changes in the sophistication of cognitive processing. Thus, a decrease in statements reflecting the knowledge cognitive domain was noted across the three weeks examined. On the other hand, statements reflecting the higher-level cognitive domains of comprehension, application, analysis, and synthesis were noted. Students' overall metacognitive awareness and regulation also improved from pre to post-IS, as did their self-perceived ability to engage in planning (i.e. goal setting) prior to learning experiences. Additionally, it is notable that changes were observed over a relatively short amount of time, indicating that focused strategies, such as CBPT, can potentially lead to improvements in higher-level cognitive processing and metacognitive awareness within a single academic term.

Improvements in regulation of cognition

While metacognitive awareness improved overall, only a significant improvement in the broad category of metacognitive regulation was discovered from pre- to post-IS, as metacognitive knowledge did not significantly change during this timeframe. Given that metacognitive regulation may be more integral to learning, academic performance, and success in advanced study (Young & Fry, 2008; Schraw, 1994), this finding is especially notable. Additionally, the planning sub-category within the broad category of regulation of cognition significantly improved from pre- to post-IS. No sub-domain significantly improved from pre- to post-IS for the broad category of metacognitive knowledge.

Planning items on the MAI focus on determining the most important learning objectives, setting specific goals, reading instructions with care, asking questions prior to task initiation, thinking of multiple ways to solve a problem, and managing time effectively. CBPT may be especially likely to foster the planning sub-domain due to its focus on problem-solving from a multitude of perspectives. Further, students were tasked with setting goals for preparedness and reading with care as they were exposed to this systematic pedagogical framework repeatedly. In turn, during weekly meetings, students engaged in CBPT activities, facilitating practice in problem-solving from a variety of viewpoints and choosing solutions for problems to mesh with their assigned role(s). Finally, post-meeting reflections allowed students to synthesize their learning, integrating new information with previous knowledge as a foundation for future IS topics.

Higher levels of cognitive processing

Knowledge and comprehension continued to be the most predominant codes assigned over the course of the IS. Likely, students were exposed to new content weekly that required cognitive processing and storage. However, trends indicate that while knowledge was the most frequently observed level of cognitive processing, the frequency with which this code was observed decreased by 50% from week 1 to week 8. During this same time frame, comprehension codes more than doubled. It could be that as time went on, student became more familiar with terms and information related to LC. As a result, demonstration of knowledge through basic retrieval of terms and facts became less pertinent whereas demonstrating advanced comprehension (i.e. comparing and contrasting, summarizing ideas, etc.) was facilitated by the CBPT model. In particular, students increasingly were tasked with comparing and contrasting clinical approaches to LC management specific to their assigned perspective, while summarizing ideas and concepts in their weekly reflections.

Application codes quadrupled from week 1 to week 8, which was expected, as students applied knowledge to solve problems in different ways as part of the CBPT framework. What was more surprising given students' limited prior exposure to LC, was that increases in analysis and synthesis were noted across the IS experience. Analysis involves seeing relationships amongst ideas. Given that CBPT requires students to take apart specific aspects of LC, particularly in case study format, students likely practiced analysis each week of the IS experience. Synthesis codes may have emerged from practice adapting, elaborating, and theorizing approaches to case-based questions. Despite practice with several higher levels of cognitive processing, it is unlikely that students in the IS had enough depth and breadth of professional knowledge after 8 weeks of CBPT to engage in behaviors connected with evaluation, which is why this code was not observed.

Applying CBPT beyond CSD

While CBPT was developed for use with speech-language pathology students, any situation in which a case-based approach can be merged with the need to understand the perspective of different stakeholders in a given context would be appropriate for the application of CBPT as an instructional approach (Author & Author, in submission). For instance:

- An instructor for a business-related course might use CBPT to simulate a hiring/firing situation. Students could take on the roles of employee, supervisor, human resources manager, or other personnel to explore the ins and outs of the employment process.
- In a physics course, an instructor may assign different “perspectives” to properties such as force, mass, or gravity. Students could, in turn, determine how these variables interact to promote a physical phenomenon.
- In a course focused on special education planning, CBPT could be used to better understand an interdisciplinary approach to working with a child with autism. Students could adopt the perspective of teachers, parents, students, teacher aides, therapists, administrators, etc., when writing goals and objectives for educational planning.
- A variety of clinical fields outside of CSD could use CBPT, as well. Instructors for dietetics, nursing, rehabilitative therapies (e.g., physical, occupational, respiratory), or medicine might use CBPT so students could practice solving clinical problems from a variety of perspectives, in a manner similar to the approach described in this paper.

Limitations

As is typical when studying students' learning outcomes, it is difficult to control for all potential intervening variables. Specifically, the pedagogical methods used in this study were applied simultaneously with students' other coursework. Thus, it is possible that factors beyond CBPT (i.e., pedagogies employed in other coursework) might have impacted the findings noted here. Further, there were other facets of students' semester-long learning outside of this course and regarding this experience. For example, students' weekly reading and reflections could have contributed to our findings. Given that this study was an ecologically valid investigation conducted during a university semester, it is impossible to determine whether our findings are a result of CBPT alone.

Additionally, although qualitative data was coded with high levels of reliability and quantitative data was obtained using a validated instrument (MAI), some level of subjectivity could have been present in both data collection and analysis. Students self-reported reflection and MAI data, which may have impacted the objectivity of information shared. Similarly, data were coded systematically;

however, some level of subjective interpretation of codes and reflection statements may have influenced qualitative data analysis.

Conclusion

Students appear to have made demonstrable changes in metacognition and higher-level cognitive processing potentially due to this IS experience. Thus, CBPT may hold promise in fostering significant learning and changes in metacognitive awareness in contexts in and beyond CSD in a relatively short period of time. Thus, CBPT may be ideal for some course instructors given the brief nature of a typical academic term.

Any new pedagogy should be studied in a variety of ways. Regarding CBPT, future research efforts might focus on expanding this work to other disciplines to determine whether similar positive outcomes are observed. Also, while difficult to implement in an academic context, a quasi-experimental research design might help eliminate ambiguity as to the specific variables that contributed to the described findings. Regardless, the implementation of CBPT likely tasks students with practicing skills that may enhance metacognition and cognitive processing beyond the use of CBL or perspective-taking alone.

Appendix 1: CBPT Activity for Alaryngeal Communication

Activity Description

Students were presented with the following case, one part at a time. Facilitators randomly assigned “roles” for each student such as: patient, spouse, surgeon, employer, best friend, daughter, or speech-language pathologist. Students wore nametags identifying their role for others in the discussion group. The IS facilitator led a discussion where each student was encouraged to respond professionally and/or emotionally to the situation described by adopting the perspective/persona of their assigned role.

Part 1: Diagnosis and Treatment Planning

Anne is a 53-year old, married woman who was diagnosed with squamous-cell cancer of the larynx approximately 10 days ago. She is meeting today with her cancer care team to talk about treatment options. Her surgeon is recommending a total laryngectomy due to the fact that her laryngeal tumor was found to have crossed the anterior commissure of the larynx. Her radiologist has suggested post-surgical radiation to minimize the chance of recurrence. Other than her cancer, Anne is in good health and is active socially. She is a receptionist at a law firm, where she has worked for the last 25 years.

Part 2: Post-Surgical Adjustment

In the period immediately following her total laryngectomy, as well as through an extended period of radiation therapy, Anne communicated with an electrolarynx (EL). She became a very proficient user of a neck-type device. With the exception of the mechanical quality of the EL signal, it met her communication needs fully and no restrictions were noted. However, at 7 months post-laryngectomy, Anne found that use of the EL was not always easy or efficient. For this reason, Anne is now seeking information on a secondary tracheoesophageal (TE) puncture from her surgeon and speech-language pathologist.

Part 3: Post-Secondary TE Procedure

In consulting with her surgeon and speech-language pathologist, a recommendation for Anne to undergo a secondary TE procedure is made. Anne's remaining concerns center on the expense of the TE procedure and general issues related to its management and care. She has requested a meeting of the whole cancer care team to review options, responsibilities, and make a final determination.

Based on Doyle, P. (2017). Communication Challenges in Laryngeal. In Author & Author (Eds.) *Laryngeal Cancer: An Interdisciplinary Resource for Practitioners* (p. 82) Thorofare, NJ: Slack.

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One Size Doesn't Fit All: Students' Perceptions of FYE Approaches

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Abstract: First-Year Experience (FYE) programs have become a focal point for efforts to transition and retain all students, as numerous studies suggest that such initiatives deepen students' academic preparation for college and support their emotional investments in the campus community. Using quantitative and qualitative data gathered from 842 students in 54 courses during Fall 2013 and 2014, this article considers the comparative merits of Living Learning Communities (LLC), "habits of mind" First-Semester Core (FSC) courses, a hybrid-model (LLC-FSC) initiative, and non-FYE courses by considering students' perception of their academic gains and social engagement. Survey results indicate that students perceive very different benefits across the various FYE models, especially when the FYE is housed in disciplinary rather than general education courses. The comparisons suggest the need for an intentional, goals-oriented approach to FYE programs, as a "one-size fits all" approach may not result in both academic growth and community engagement for students. For institutions with limited faculty and curricular resources, the choice of which type of FYE model to adopt is particularly important.

Key Words: First-Year Experience (FYE), Living-Learning Communities (LLC), First-Semester Core (FSC), retention.

First-Year Experience (FYE) programs have become a focal point for efforts to transition and retain all students. 95% of colleges offer First-Year Seminars in hopes that they help students become more academically prepared and emotionally engaged in ways that will encourage them to remain in college—and perhaps more specifically—to remain loyal to the particular college at which they initially enrolled (Goodman and Pascarella, 2005). Each institution's increasingly significant investment in its student body requires a dual focus on academic preparation, and emotional and social acclimation. Kuh et al. (2008) provided data to support Braxton et al.'s (2004) proposal that "psychosocial engagement," or the energy students invest in social interactions, directly influences the degree to which they are socially integrated into college life" in the context of "the interplay between student behaviors and perceptions of the institution and psychosocial engagement." Much is expected of FYE programs, and they often call on otherwise discrete campus units with divergent priorities—particularly Student Affairs and Academic Affairs—to work together (Blimling, 2001 cited in Brower and Inkelas, 2007). Despite requiring significant campus resources, such as time and money for faculty development, staff training, administrative attention, housing issues, co-curricular events, and

assessment, the value of FYE programs is nonetheless substantiated throughout the literature (Goodman and Pascarella, 2005; Brower and Inkelas, 2010; Stassen, 2003; Zhao and Kuh, 2004).

FYE programs—including learning communities, living-learning communities, first-year seminars, and first-year experiences—may be aligned with disciplinary outcomes, general education outcomes, student interest, and/or faculty expertise. The myriad forms of FYE, however, means that there is no “one-size fits all” approach and what works at one institution or for one cohort of students may not work so well for another (Hunter 2006; Jaffee, 2004; Kuh et al, 2008; Finley and Staub, 2007). In addition, students’ abilities to transfer academic and psychosocial gains in an FYE to other course experiences and across their college career may be limited. For example, students may resist or resent FYE in general education courses, seeing them as busy work interfering with the “real” work of their major. This may negatively influence outcomes associated with the FYE.

So despite the near unanimity of enthusiasm for and expansive research on adopting FYEs, their creation and maintenance requires significant attention to the desired outcomes and institutional contexts. We offer this article as a case study that explores the challenges of designing a sustainable FYE for a mid-sized comprehensive private university with limited resources. We begin by describing the institutional and pedagogical contexts that frame our work, and the methods for implementing specific FYE initiatives on our campus: Living Learning Communities (LLC) and First-Semester Core (FSC) (described more fully below). These two initiatives, both targeting first-year students, differed in their focal outcomes and thereby represent different models for approaching the FYE. We anticipated that LLCs, with their focus on building community, might be more effective in cultivating students’ social connections, whereas the FSC, with their focus on fostering academic habits of mind, might be more effective in developing students’ academic skills. Using quantitative and qualitative data gathered from students in 54 courses of four types during Fall 2013 and 2014, we compare first-year student perceptions of LLCs and FSCs with those of students in hybrid LLC-FSC and “control” non-FYE-specific courses. The quantitative and qualitative data from the surveys distributed to students reveal that some FYE models might be more effective in achieving particular student outcomes than others, and that a single model may not achieve all desired results. We conclude by tracing the relative merits (and drawbacks) of the LLC and FSC approaches to FYE to consider the potential benefits of a hybrid (combined LLC-FSC) model. We argue that intentional decision making about the goals of the FYE is crucial, especially in an institutional context like ours in which resources are limited. In making those decisions, then, our data suggest the need to consider some important questions, namely: the ways in which different initiatives might be profitably combined—and the extent to which a single hybrid-model can effectively serve different sectors of our student body moving through various curricula.

The Problem

Institutional and Pedagogical Context

The case study presented in this article is drawn from a mid-size, private comprehensive university that has not yet developed a robust FYE for students despite several iterations of dedicated attention to general education. In 1995, faculty applied for and received a grant from the Davis Foundation that led to the implementation of a general education curriculum comprising five discipline-based “core” courses, a selected core concentration of five courses in one traditional liberal arts discipline, a senior capstone, two courses in writing, and one in math. Designed to offer breadth and depth, the core curriculum was initially taught by a small number of arts and sciences faculty who were able to work closely together, but as the University expanded, the ability of the faculty to maintain coherence—especially with little administrative oversight or resourcing—resulted in a splintering of the curriculum.

Gradually, “the core” came to be seen by students and even by some faculty as something to be “gotten over with” as soon as possible, creating a negative orientation toward first-year courses which students in subsequent focus groups described as “intro intro” courses rather than challenging and engaging academic forays. More recently, a general education committee and dedicated dean have been charged with investing in ongoing evaluation and, as prudent, proposing revisions to the curriculum. Part of the dialogue has focused on how to design and implement a robust FYE program. Prior to this, other faculty and administrative groups independently undertook “pilot” efforts to explore first-year programming which resulted in implementation of the efforts described in the next section.

The Solutions

Two Initiatives

Beginning in the spring/summer of 2013, two different initiatives were undertaken in varying degrees of conjunction with broader general education reform: Living Learning Communities (LLC) and First-Semester Core (FSC) courses. The radical expansion of a very small ongoing LLC experiment was led by the administration, chiefly with the understanding that LLCs improve student retention by bonding students to faculty mentors, each other, and the campus community. The much smaller FSC initiative was organized and led by faculty with the intent of integrating an intentional focus on academic habits of mind into required core classes dedicated to first-semester students that might better prepare them for college. In 2014, the two types of courses were merged to create some hybrid LLC-FSC courses, in the hopes of retaining the best elements of both, that is, the social emphasis of the LLC and the academic focus of the FSC. Separate LLC courses were retained in 2014. In 2013, non-FYE courses were included as a type of “control” in which upper-class students were enrolled alongside the first-year students and no specific FYE outcomes or programming were included.

The learning outcomes for the LLC initiative revolved around the concept of “community,” and were articulated in writing by a small team of administrators and faculty:

1. Students will recognize that there is no individual learner apart from a community of learners
2. Students will identify a degree of reciprocity and responsibility in their relationship with other learners; Students will articulate the personal and communal importance of the RWU pledge ‘to conduct ourselves responsibly and honorably, and to assist one another as we live and work together in mutual support’
3. Students will discover that ‘in the classroom’ and ‘out of the classroom’ experiences constitute a discrete continuum of learning
4. Students will develop peer and faculty connections during their first-year living-learning experience that will carry over to future active and collaborative learning.

Faculty development and preparation for the LLC program consisted of a required one-day summer workshop in which outcomes were discussed, student affairs staff were introduced, and resources were announced. Outside of the required workshop, there was no faculty “training” for teaching an LLC. In 2013 (but not in 2014), faculty met twice during the semester to share their perceptions of the emergent strengths and challenges, but attendance at these meetings was not mandatory. LLC faculty received stipends of \$1500 for the semester, and classes were capped at 24

as further incentive.¹ While there were elected faculty representatives on the LLC planning committee, the initiative was largely driven by administrators, and decisions about how and whether to extend the program into a second year were made prior to the collection or analysis of the data that follows.

At the same time, in 2013, faculty members who had been deeply involved in a prior movement toward significant general education reform sought to maintain the momentum for an academically robust first-year experience by designing the FSC initiative. With financial and course allocation support from the administration, faculty leaders created the FSC to help students achieve desirable and widely appreciated learning outcomes (habits of mind) and enhance their success in all their courses. These FSC learning outcomes were iteratively discussed and agreed upon by the FSC faculty:

1. Explanation
2. Interpretation
3. Evaluation
4. Synthesis
5. Empathy
6. Reflection

The FSC courses were formed by integrating these outcomes into the five pre-existing disciplinary core (general education) courses,² so that content of the core courses (based on their respective outcomes) remained the same but would be supplemented and enhanced via the FSC outcomes. Building upon the literature on educational theory and outcome-based learning (Fink 2013, Wiggins and McTighee 2005), the FSC learning outcomes were designed to more fully engage students in academic coursework and to help them develop academic skills across levels of Bloom's Taxonomy. In addition, other goals of the FSC initiative were to: 1) enhance the educational experience of first-semester students, in part by providing the "safe space" of a class with only first-year students 2) improve their transition to college academic life, 3) and complement other efforts for increasing student retention rates.

Initially open to full-time faculty with prior experience teaching Core (general education) courses, and later opened to part-time faculty, the participating faculty met extensively and consistently throughout the summer before instruction and during the fall semester while teaching the FSC class.³ These monthly meetings allowed faculty to discuss common readings on outcome-based learning and backward design, as well as to identify and assess the goals of the FSC. Faculty received stipends of \$500 for their monthly meetings through the summer and fall semester, and classes were capped at 18 in 2013 and then 24 in 2014 when most FSC courses were integrated with an LLC component.

Analysis of the Solution(s)

Methods

Participants were 842 first-semester students enrolled at a private, residential comprehensive university in Rhode Island, USA with an enrollment of approximately 3900 undergraduate students. The

¹ In 2013, 21 faculty lead LLC courses; in 2014, the number increased to 27.

² Core 101: Scientific Investigations; Core 102: Challenges of Democracy; Core 103: Human Behavior in Perspective; Core 104: Literature, Philosophy, and the Examined Life; Core 105: Aesthetics in Context-The Artistic Impulse.

³ In 2013, participating faculty included nine faculty teaching FSC courses in the fall and two faculty facilitators who did not teach an FSC course; in 2014, the numbers increased to 11 faculty teaching courses, plus the two facilitators.

surveyed students were from two cohorts: the first-year students entering in the fall semesters of 2013 and 2014. The academic first-year experiences of these students varied as follows: students enrolled in an LLC (some connected to Core course and some to a disciplinary course, often a foundational course in the student's major; all LLC courses were restricted to first-year students); an FSC (all of which were Core courses restricted to first-year students); a hybrid-model (LLC-FSC) (all of which were connected to a Core course and restricted to first-year students); or a Control class (some of which were disciplinary in focus, others of which were Core classes; these classes were not restricted to first-year students). Across the two years, we surveyed 55% of the LLC sections (29 of 53 sections); 82% of the FSC sections (9 of 11 sections); 73% of the hybrid LLC-FSC sections (8 of 11 sections); and 8 control sections.⁴

LLC Courses In both years, approximately half of the University's total incoming student population was placed into Living Learning Communities (LLCs). These students lived in dorm rooms on the same floor (with a shared resident assistant) and enrolled in one common course. Students were assigned to specific LLCs based upon their responses to a residence life survey administered prior to orientation, where they were asked to select three choices of LLCs: options included disciplinary courses required for students' majors, and required general education core courses, a small number of which were populated exclusively by "deciding" (undeclared) students. In addition to a shared community service requirement before classes started, two co-curricular activities—one on-campus event, one off-campus event—were required to foster student connection to their peers, faculty, institution, and local community (see course outcomes above). LLC sections were capped at 24 students, based upon housing groupings. 65% of the LLC sections were affiliated with introductory courses in a major area of study (i.e., Public Health, Criminal Justice, Psychology, Engineering, Architecture), and 35% were affiliated with general education courses required as part of the University's core curriculum.

FSC Courses In 2013, a smaller number of students (approximately 162) were enrolled in an FSC course. Students enrolled in the FSC courses did not self-select this option, nor did they know before classes began that they were in an FSC section of their core class. FSC students did not share a residence hall, nor did they participate in course-based co-curricular activities; moreover, because the FSC courses were all general education classes, students in these courses were from all majors, including students still undecided. Course sections were capped at 18 students per course section.

Control Sections (Fall 2013 only) Control sections were comprised of both first-year students and upperclassmen (147 students in total), though only first-year students within them were surveyed for this study. Some control sections were second sections of courses taught by a faculty member who was also teaching an LLC or FSC for the same course. 38% of the control sections were affiliated with introductory courses in a major area of study (i.e., Business and Criminal Justice), and were capped at 32 and 20 students respectively, while 62% were affiliated with a general education CORE course, capped at 25 students.

Hybrid LLC-FSC Courses (Fall 2014 only) In the fall of 2014, an option for a hybrid LLC-FSC model was added: all FSC sections became LLCs, although not all LLCs were FSCs. In other words, all students in this hybrid course type were in LLCs that integrated the habits of mind for core (general education) courses. Other students were placed in discipline-specific LLCs, which did not include the FSC habits of mind in the curriculum. Combining the LLC and FSC learning outcomes in the hybrid

⁴ We invited all faculty teaching LLC, FSC, and hybrid LLC-FSC courses in the fall of 2013 and 2014 to participate in the assessment. Faculty who agreed to participate had their students complete the survey during a class period near the end of the semester. In fall 2013, we invited faculty teaching introductory, first-year courses in the disciplines and in general education to participate in the assessment as control sections (8 agreed to participate, some of whom were teaching second sections of the same class as an FYE).

model represents the university's efforts to move toward a more integrated set of first-year experiences. Blending the outcomes provides a natural comparison group representing an additive model, and which allow for a more detailed analysis of discrete components. Like LLC sections, hybrid LLC-FSC courses generally had 24 students per course section, based upon housing groupings. 264 students participated in 11 sections of a hybrid LLC-FSC course.

Procedure and Measures

At the end of the Fall 2013 and 2014 semesters, 842 students in LLC, FSC, Control, and Hybrid LLC-FSC classes were administered a brief survey designed to assess students' perceptions of their own learning and experiences within their first-semester course [Table 1]. The survey included both 5-point Likert-scale (Q 1-14) and open-ended questions (Q15-19) targeting LLC learning outcomes, FSC learning outcomes, and students' overall perceptions and experiences in the course. To explore the survey results and identify differences in students' perceptions of first-year experiences, we conducted a series of one-way Analysis of Variances (ANOVAs), followed by Tukey post-hoc analyses, across the four course types for each quantitative item of the survey (Q1-14), with significant differences determined at $p < .05$. Prior to combining the 2014 and 2013 data, preliminary analyses were conducted to examine potential differences in student perceptions across cohorts (2014 vs 2013). The findings revealed a lower level of student perceived satisfaction in 2014 compared to 2013 for multiple items on the survey (Q1, 10, 12, and 14). Upon closer inspection however, these cohort differences could be accounted for by differences in the types of comparison groups offered each year rather than by the cohort itself (FSC-LLC in 2014, Control group in 2013). Thus, the data were combined to allow for a more comprehensive analysis of between group differences in student perceptions of academic first year experiences. Means and statistical analyses for the Likert-scale questions are presented in Table 2. For simplicity and clarity, the narrative description of the results, below, highlights key differences.

The second part of the survey asked five open-ended questions to solicit qualitative feedback. Students were instructed to write short answers based on their perception of the course content and goals—what the class was and what the student expected to learn—not based on their perception of the instructor (all students were given the opportunity to evaluate their instructors in an online course survey administered by the university).

We first read through the responses to gain a general sense of students' perceptions about their experiences in a first-year class and to ascertain what trends or themes emerged from the data. Our research assistant then coded the answers for each question by cohort, according to the themes that emerged in the responses to each question. Themes were identified based on common trends relating to various aspects of the courses such as class structure, assignments and activities, and professor and peer interactions. Because survey questions were worded differently as appropriate for the specific cohort, responses tended to focus on different facets of the students' experiences (social versus academic) between cohorts; therefore, the themes for each question are not identical across the cohorts. In reading the responses, we read both within and across cohorts. Reading within cohorts reveals valuable information about how students perceived the strengths of the class/program and about recommended improvements. For our purposes, however, reading across cohorts is more revealing as it indicates that the distinct foci of the LLC and FSC initiatives directly impact students' perceptions.

Table 1: Survey Questions

Student Survey of Course Experiences

1. This course has helped prepare me to succeed academically at RWU.
2. I have improved my ability to synthesize information because of this course.
3. This course has helped me feel like I am part of an academic community with other RWU students.
4. During this semester, I have reflected on my own learning and understanding of course concepts.
5. Throughout the semester, I have given my best effort on course assignments.
6. I have connected or applied information learned in this class with experiences that I have had outside of class.
7. In this course, my learning has been enhanced by working with and listening to others.
8. This course has helped me improve my ability to explain information.
9. By participating in this course, I have improved my ability to learn college-level material.
10. This course has helped me increase my ability to empathize with other people.
11. My relationships with my classmates have helped motivate me to succeed in this class.
12. Overall, I am satisfied with how much I have learned in this class.
13. Overall, I am satisfied with how much my academic skills have improved in this class.
14. Overall, I am glad that I was able to have this class experience.
15. In thinking about this course, what do you see as its strengths?
16. What aspects of the course would you suggest need improved?
17. What information, skills and/or experiences would you like to have had in your first-semester at college to help you transition to college life and academic work?
18. Overall, how would you describe this experience to a student who is thinking about signing up for it?
19. Do you have any other comments about the content and goals of the course that you would like to share?

Table 2. Mean values of student survey responses for 14 questions across six course types and grouped by question theme.[#] Different letters among means in a row indicate significant differences with the post-hoc Tukey test.

Survey Question Number^	Disciplinary		General Education (Core)				F value	p value
	LLC	Control	FSC-LLC	FSC	LLC	Control		
Academic								
1	4.06a	4.52b	3.62cd	3.99ae	3.52c	3.97ade	15.36	0.000
2	3.89a	4.23a*	3.79a*	3.99a	3.47b	3.87a	10.07	0.000
8	3.84a	4.13a	3.86a	3.92a	3.39b	3.82a	9.67	0.000
9	3.95ab	4.17ab	3.78abc	4.10b	3.67c	3.98abc	5.28	0.000
12	4.07ab*	4.53a	3.76bc*	4.26a	3.64c	4.21a	13.78	0.000
13	3.9ab	4.27a	3.72bc	3.97ab	3.51c	3.95ab	8.32	0.000
Community								
3	4.23a	4.21ab	3.92ab	3.81b	3.82b	3.81b	7.25	0.000
6	3.98a	4.21a	3.86ab	4.09a	3.68b	4.00ab	4.44	0.001
7	3.98ab*	4.27a	4.07a	4.15a	3.73b*	3.95ab	5.14	0.000
10	3.70a	3.67ab	3.86ab**	4.01b	3.52a**	3.76ab	5.06	0.000
11	4.04a	3.90ab	3.87ab	3.69b	3.73b	3.52b	4.74	0.000
Self-Efficacy								
4	3.97a	4.27a	3.90ab	4.14a	3.72b	4.10a	6.78	0.000
5	4.20	4.52***	4.32	4.37	4.16***	4.27	2.38	0.037
Overall Satisfaction								
14	4.22a	4.45a	3.82b	4.24a	3.82b	4.33a	7.72	0.000
Notes:								
# The sample size for each sample grouping (type of course) is:	298	52	94	152	184	62		
^ The text for each question is provided in Table 1.								
* These pairs differ at p<0.058.								
** The noted pair differs at p=.061.								
*** The noted pair approaches significant (p=0.07) with the Tukey test.								

Reflection

Results and Discussion

Results from our student surveys support previous findings that FYEs can play a significant role in first-year student retention and engagement. They also indicate the need for careful attention to the desired FYE outcomes, as not all models will simultaneously yield both academic growth and community engagement. The quantitative survey data reveal that overall student perceptions of learning gains and satisfaction were higher for disciplinary courses than general education courses. Indeed, for general education courses, students in LLC sections indicated they were less satisfied than students in control courses in terms of academic gains. Within the general education courses, students in FSC sections reported stronger academic gains than did students in LLC sections, suggesting that explicit focus on academic skills and habits of minds may be an important component of FYEs designed to intensify student gains in general education curricula.

Qualitative data gathered from the open-ended survey questions add another layer to our findings. In contrast to the LLC sections (both disciplinary and general education), where students valued social relationships, students in FSC courses praised the academic rigor and class structure as the primary benefits. While the different foci in students' comments between LLC and FSC classes

are unsurprising given the different emphases of the FYEs, it does indicate the need to design FYEs around desired course outcomes as the LLC component may interfere with academic gains unless they are an explicit focus in the class.

Table 3. Number of student responses to the question "In thinking about this course, what do you see as its strengths?" in 9 qualitative themes across six types of FYE courses. See the main text for descriptions of the course types. The largest number of responses per class type is bolded to highlight differences among the LLC, FSC and Control courses.

Theme	Disciplinary		General Education (Core)			
	LLC	Control	FSC-LLC	FSC	LLC	Control
Peers	199	6	18	0	117	5
Class Content (e.g., assignments)	14	11	23	38	25	7
Professor	10	10	0	2	4	11
Class Structure (e.g., discussions)	8	3	28	48	9	8
Relatability	3	0	1	7	3	0
Skills (Thinking)	0	0	0	30	0	0
Grades/Success	0	5	0	0	0	10
No strengths	6	0	0	0	5	0
Other	0	9	14	6	2	15

Is the LLC an Effective FYE Model? Our research demonstrates that students' perceptions of the effectiveness of the LLC model depends on whether the course is attached to a discipline-based class (e.g., an introductory course in the major) or to general education. Within the disciplinary-based LLCs, we found few differences between the LLC sections and the control sections. The only significant difference is that students in the control sections agreed that the course helped prepare them to succeed academically at RWU (Q 1). Within the general education sections, LLC students' perceptions of academic gains are significantly lower than those of their counterparts in the control sections (Q 1, 2, 4, 8, 12, 13, and 14).

LLC students in both discipline-based and general education sections perceived strong social gains from living together and taking a common class. They commented overwhelmingly on the social aspect of the class as its primary strength, explaining, as one student did, that "[i]t is more cohesive than other classes since we also live with each other. This class is the most social out of the rest of mine." Many students commented on the ease with which they could obtain help from classmates living in the same dorm, stating that "since most of us live together, it is easier to seek help from classmates" and "being an LLC we have an immediate group of friends to go to when we need help." In addition to facilitating their ability to obtain "help" from their peers, students reported that they developed close bonds with their classmates, "building friendships that will take us through college." Students seemed to perceive positive benefits from those friendships, but a few noted that the strong interpersonal relationships between classmates intensified peer pressure. Living together meant that students could not remain anonymous in class, which sometimes inhibited participation: as one student noted, "the relationship with my LLC floor interfered with my participation in this class because I did not always feel comfortable talking up in class."

It is perhaps important to note that in the Likert-scale questions, no differences emerged between the LLC and control sections in terms of social interactions—yet the open-ended questions told a different story. Students in the LLC sections provided copious commentary about the social strengths of the class, while the control sections did not comment on their peer relationships (either affirmatively or negatively). Perhaps the inconsistency between the quantitative and qualitative results

stems from students' affective response to social interaction overwhelming their cognitive perceptions of the academic benefits of community and collaboration. In other words, students recognized the emotional connections they developed through social interaction with their peers, but did not recognize how such interactions might prompt academic gain.

It is also important to note that while LLC students overwhelmingly praised the LLC structure for enabling them to develop close relationships with their classmates, others criticized the LLC for limiting their peer relationships. A number of students commented that they felt constrained by the LLC because they weren't easily able to develop friendships outside the LLC. As one student put it, the LLC was "[t]oo closed off for freshmen, would like to be able to meet many people with different majors." In addition to not finding friendships outside the LLC, some students indicated that the LLCs resulted in too much "togetherness". According to one student, "people have complained on living and taking classes with the same people—you are with the same exact kids all the time."⁵

Is the FSC an Effective FYE Model? Our findings indicate significant differences between the FSC and general education LLCs. The FSC students responded more favorably for 10 of the survey questions (Q 1, 2, 3, 6, 8, 9, 11, 12, 13, 14), demonstrating that within a general education program aimed at helping students develop their academic skills, the FSC model is a better choice than the LLC. Given the limited resources for supporting FYE programs that are available to most colleges and universities, it is probable that choices will have to be made about the type of FYE program most likely to deliver the desired outcomes—including social connections, academic success and retention. Assuming that academic success is a universal goal for FYE programs, our results suggest that administration and faculty might most appropriately support general education FYEs that contain an explicit and intentionally integrated academic focus.

As with the LLC students in general education courses and students in control sections (non-LLC sections of the same general education courses), no differences emerged between student perceptions in FSC (all general education courses) and general education control sections. This suggests important lines of inquiry for future research. It is possible that because the control sections included upperclassman, while the FY courses were restricted to first-year students, students in the control sections perceived a higher academic rigor—a perception that matched FSC students' perceptions of the academic gains of a first-year course with an explicit emphasis on academic habits of mind. It is also possible that students did not fully recognize the strengths and weaknesses of an FYE at the end of their first-semester; follow-up surveys one to three years after their experiences are needed to see if they yield new information.

In contrast to the lack of differences between the FSC and general education control sections, the qualitative data provides insights that suggest important nuances in how students perceived the strengths of their respective classes. The top three positive experiences for students in control sections were: the professor, the class content/assignments, and grades/academic success. Developing positive relationships with their professors, and seeing the faculty as being open to questions and willing to help students, was an important positive experience of their first semester for nearly a quarter of the students (20). As one student put it, they appreciated "how easy it is to talk to my teachers in and out of class. The teachers want each student to do well, so the teacher-student relationship is really nice." Other students commented on specific accomplishments related to course content and assignments as being the most significant positive experience in their courses. Here students identified completing a business plan or learning oral communication skills as significant. Finally, many students reported

⁵ We suggest that students' perceptions of "constant togetherness" may be exaggerated. Students took 3 or 4 courses that were not part of the LLC and thus included students with whom they did not share dorm space. However, while students' perceptions on this point may be overstated, they are an important finding as it suggests other interventions might be useful to help students meet and interact more with peers from different courses and residence halls.

their positive experiences relating to grades. These students felt proud to have put significant work into their studies, and to have earned good grades as a result. “My most positive experiences in my courses would be succeeding in them. I put a lot of effort into my work, so when I get the grades back it is a great feeling to know my work is appreciated,” one student commented.

Unlike the LLC students, the FSC students did not overwhelmingly agree on a primary strength; instead, they reported nearly equally on three strengths: the class structure, the academic skills gained through the class, and the class content. Around one-third of the students (39) commented that the structure of the class was a significant strength. Students commented on the benefits of class discussion and reading assignments, stating that they afforded opportunities to expand one’s perspective and develop collaborative skills. As one student phrased it, the class “helps you think of the world differently, gives you a different perspective and leaves you with questions that can make you think and/or act in a different, more positive way.” Another primary strength, according to a little over one-quarter of the students (30), had to do with the academic skills (the habits of mind outcomes) emphasized throughout the semester. Students commented on critical thinking, close reading, textual analysis, and on thinking outside the box. One student wrote, “the strengths of this course are in learning to be skeptical—not to take everything at face value and blindly agree to it. The course taught me to really read a piece and decide whether or not I agree with what it says and then explain why or why not.” Another added, “A strength of this course would be its preparation for critical thinking and personal growth. We did a lot of self-reflection and focused on our future goals, which I think is important.” Other students identified the class content—and specific types of assignments—as the major strength of the class. These students commented explicitly on course content such as democracy, sociology, literature and philosophy, but they also talked about how the course emphasized connections between what they were learning in class and “real world” applications. For example, one student shared that, “I see the strengths of this course as the ability to connect ideas of the social sciences with students’ everyday lives and real world experiences.” Another student reiterated this point, stating that the course’s strength is that “we learn concepts about ourselves that we can apply to our everyday lives. This course makes the students think deeply and ask questions.”

Although students’ reported satisfaction with the course and perceptions of its strengths do not appear to differ between the FSC and control sections, what they actually say about those strengths is markedly different across cohorts. While the FYE may not yield greater student satisfaction than a non-FYE general education course, how students perceive the respective value may be of import in determining which programs to offer (if any).

Does a Hybrid LLC-FSC Model Have Benefits? The second year of our FYE study gave us the opportunity to combine the LLC and FSC approaches in a few sections, to consider the benefits of a hybrid model. Combining the social strengths of the LLC and the academic habits of mind focus from the FSC would seem a reasonable foundation for a strong FYE experience. However, our results indicate students do not perceive the same benefits we expected they would. In fact, few differences emerged, though the hybrid LLC-FSC did score lower than control sections on overall satisfaction (Q 14). The hybrid LLC-FSC model scored higher than the LLCs for one question [Q 4], which suggests that the hybrid model generally retains the benefits of the FSC—but not in terms of the emphasis on metacognition. This is perhaps a significant detriment, given the role metacognition plays in learning transfer. The hybrid LLC-FSC model also scored lower than the FSC in regards to overall experience with the course (Q 12 & 14), which suggests that in some cases the LLC component may interfere with students’ learning experiences.

Students in the hybrid LLC-FSC model echoed their FSC counterparts in ascribing the strengths of the class to prompting new (and deeper) thinking. As one student put it, “[a] strength of this course would be its preparation for critical thinking and personal growth. We did a lot of self-

reflection and focused on our future goals, which I think is important.” With the added LLC component, students in the combined model also reported their relationships with their peers as a primary strength: “having people in the class that you live with really helps. That way if you need help with something, or don't remember what an assignment is there are other people right there that you can ask.”

Overall, is it Worthwhile to Invest in FYE?

The overwhelmingly positive responses from students across the LLC, FSC, and LLC-FSC courses suggest it is indeed worthwhile to invest in an FYE. Of course, we recognize that students’ perceptions are but one factor to evaluate in determining the benefits of FYEs: it is also important to examine the potential long-term impact of FYE on student retention, academic success, graduation rates, etc. Indeed, we would have liked to contextualize our survey findings with this information, but such data was unavailable to us.⁶ Still, we encourage administrators and faculty contemplating an FYE to consider what kind of FYE is most efficacious for their purposes. Given the limited resources with which most institutions have to work, and given that there is no “one size fits all” model of FYE, our results suggest that it may be necessary to prioritize desired outcomes in order to design an appropriate FYE. The FYE programs were initially driven by two very different motivations: the LLCs, driven by administration, were designed to increase retention; the FSCs, driven by faculty, were developed from a desire to help students improve academic skills and also improve engagement with the general education curriculum at the important first-year level. The bifurcation in these pilot FYE programs meant that some focused on social engagements, with others focusing more exclusively on academic gains. Both FYEs achieved their respective goals, but we suspect that most faculty and administration might agree that a better goal would be to achieve gains on *both* the social and academic fronts. However, our findings suggest that simply combining learning outcomes is not necessarily effective. In fact, while the LLC initiative may have produced relatively strong perceptions of positive social engagement, and positive experiences for courses in the major (Palm and Thomas 2015), it actually appeared that students registered a negative impact on the academic gains when the LLC and FSC initiatives were combined into a hybrid model. Still, the careful study of the quantitative and qualitative data does suggest that, at least on our campus, LLCs work better for students in major-related rather than general education classes, and that if FYEs are going to be integrated into general education, it is perhaps best done through an academically-focused set of outcomes similar to the Habits of Mind piloted in our FSC sections. In short, if we want to increase student engagement (and thus retention), while also developing academic habits of mind—especially in the context of general education—then we need to make careful decisions about how to design an appropriate FYE.

While we do not dispute the general valuation in higher education of FYEs as best practice, we argue it is important for administrators and faculty to continue to search for the right program to prepare students for their college future and bind them to the campus community. Although constrained by limited resources for faculty development and current curricular structures that make the creation of a dedicated first-year seminar a challenge, the university in this case study has nonetheless provided very positive experiences for the vast majority of its incoming students, as reflected by the high averages on the survey responses (all on the agree side of the scale). While this study has highlighted differences in student perception of their social and academic gains, overall, students perceive their experiences very positively; even so, we suspect there remains much about

⁶ We do hope in the future to work with institutional research to explore the long-term effects of these FYE models on student retention and academic success.

learning and community in their first year that students will not be able to reflect on until they are well beyond it.

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Student-Directed Exam Reviews, Real-Time Collaborative Composition, and Assessment of Student Preparation

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Abstract: This paper outlines a method for student-directed creation of exam review guides. No answers or lists of required information are provided to students. Students must reflect on the purpose of the course and the relationships between the different content units in order to collaboratively compose a study guide. The professor then critiques the guide, providing the students with an assessment of their collective level of preparation for the exam.

Keywords: exam reviews; collaboration; peer critique; study guides; active learning; retrieval

Many students want to know what will be asked on an exam and the correct answers. Acquiescing in this forgoes the opportunity for more meaningful exam review. In disciplines such as philosophy, it is antithetical to the point. One does not improve at textual analysis or criticism of arguments by memorizing a provided list of answers. Review as a group discussion is better, but those most in need of review are least likely to engage, ask questions, or answer questions. Other review methods include working through sample problems together in class, Jeopardy games, and practice exams (Hackathorn et al., 2012; Keck, 2000).

Recognizing that “students at all levels of academic ability benefit from an objective assessment of their preparation for a final exam” (Balch, 1998), I outline a method for providing group assessment rather than individual assessment. Students collaboratively compose a study guide. The instructor assesses the guide. The students then continue their review in light of that assessment.

Composition Method, Feedback, and Effectiveness

Explain the scope of the exam. Provide a list of readings and units that will be covered. One could also provide sample questions without any answers, with the caveat that the collection of questions is incomplete. Before the in-class review period, have students think about what an exam on these topics *should* include. For example, if an ethics exam will cover John Stuart Mill’s utilitarianism, have the students think about what arguments and positions from the reading one should master in order to demonstrate competency on an exam. Their question switches from the passive and uncritical “will this be on the exam?” to the active and critical “should this be on the exam?” Students must put themselves in a position to determine what should be on the exam, which requires careful rereading of key texts, broad reflection on the purpose of the course, and analysis of how the topics relate to each other. This is better preparation for the exam, and a more intrinsically worthwhile intellectual activity, than attempting to memorize answers.

We find evidence in the literature that active learning exercises increase reported memory retention and engagement more than passive content review activities (Smith & Cardaciotto, 2012). Reflective and creative activities lead to memory benefits due to the generation effect. Memory retention is greater for content that is generated rather than merely read (Slamecka & Graf, 1978). Active learning techniques that provide students control also enhance memory retention (Markant, Ruggeri, Gureckis, & Xu, 2016). Requiring active memory retrieval instead of providing a list of

content to memorize reaps the benefits of *retrieval-based learning* (Karpicke, 2012; Karpicke & Grimaldi, 2012). “[E]xpressions of knowledge involve retrieval and depend on the retrieval cues available in a given context. Further, every time a person retrieves knowledge, that knowledge is changed, because retrieving knowledge improves one’s ability to retrieve it again in the future. Practicing retrieval does not merely produce rote, transient learning; it produces meaningful, long-term learning.” (Karpicke, 2012) In the novel form of exam review presented here, students exert creative control over their learning activities. They must determine what *ought* to be on the exam, decide how to structure the content, retrieve the most important content from memory or the texts, and compose their own study guide.

Students bring laptops to class and write with an online, multi-user, synchronous word processor. (If all students do not have laptops or tablets, hold the session in a computer lab, have people share computers, or have some students write in longhand and then paste a picture of their contributions in the shared document.) I use Google Documents and provide the class with a template containing a table of contents that matches the list of texts and units distributed earlier. Send students the link to the shared document. The entire class will compose a single document together in real time. Assign students to small groups. Give each group a specific content section to compose. They must write that section, after which they can move throughout the guide and write on topics of their choosing. They are also instructed to write marginal comments, questions, and proposed corrections to what other students have written. Students are not to delete anyone else’s contributions, only to comment on them. Writing and reviewing becomes social, both face-to-face within their subgroups and online throughout the class. They read, evaluate, and respond to what their peers write.

Allow students to ask you questions during this activity, but require that they also provide their own best answer to their own question. If the answer is correct, confirm, if not, let it serve as the starting point of a discussion. Never dispense answers upon request during the review session. For incorrect or incomplete answers, guide a discussion towards what they need to know. Make them achieve the goal together by working to retrieve the relevant content from memory or the texts.

After class, lock the document to prevent further student edits. Then comment directly on the shared document. Using marginal comments, identify errors and gaps that the students must correct. This reorients students from content memorization to an active, reflective, multistage review. I will provide examples of feedback in my field that can be adapted for other disciplines. Students often fail to define important philosophical terms, give promising but incomplete definitions, or give incorrect definitions. I flag these as: missing, incomplete, incorrect. If the guide has gaps in its coverage, I write a question that, upon reflection, provides guidance for finding the relevant content in the readings. If the guide addresses a topic but does not provide a full explanation, I flag this as well. For example, while writing a guide for Plato’s *Apology* the students might write that Socrates claims death is not to be feared. If they do not provide his argument for that conclusion, I write “missing argument” in the margins. Where the students make interpretive claims about a text I provide a counter-argument or question to encourage them to strengthen their analysis. All these methods make the review engaging and critical, and they require students to continuously go back and work with the original texts. These particular problems with student review and exam performance will be familiar to philosophers and are given as a template that can be modified for professors in other disciplines, who will already be familiar with variations on these problems as well as other common exam mistakes.

This approach is superior to providing students a list of required content. As discussed above, we have evidence that acquisition of knowledge, memory retention, and engagement increase when active learning methods are employed, when students have control over their activities, when

students must retrieve content from memory or texts (instead of finding it on a provided guide), and when students must generate something original. I have observed the following changes since implementing this process: there are more scores clumped near the top performer in the class, there are fewer extremely low scores, there are fewer students whose exams indicate that no studying was done. This method forces everyone to study. It also creates a peer pressure dynamic when the process is iterated. Since students are put in small groups, those completely unprepared to contribute may feel awkward. Most students are motivated to avoid awkwardness in class. Those who are unprepared for the midterm exam review have a motive to be ready for the final review session.

Aside from exam outcomes, this activity is more of an intellectual challenge than studying a ready-made guide and therefore has its own intrinsic value. This form of review requires active, creative thought that is discipline-specific. The activities of retrieving the right content and structuring the guide must be sensitive to the specific discipline and course, as opposed to the more generic activity of attempting to memorize a ready-made study guide. The students also learn from each other. Most classroom discussion heavily involves the instructor, but given the restrictions of this activity, the instructor plays a minor role. Students within the same group share their perspectives on the topic and work together to correct misunderstandings and gaps in their comprehension. The entire class evaluates and comments on each other's contributions to the guide. By taking charge of their own review session, thinking critically about what one *ought* to know about the course content, and sharing and critiquing ideas, the students better prepare themselves to do well on the exam and to derive more benefit from the entire course.

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