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Lang/Saleh/Bista

Special issue on

Next Steps: Research, Pedagogical, and Collaborative Outgrowths of Interdisciplinary Teaching

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Edited by
Krishna Bista, Shyam Sharma,
and Rosalind Latiner Raby

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TABLE OF CONTENTS

OJED
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Volume 8, Issue 1 (2019), pp. 1-5

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What is the Identity of Interdisciplinarity?

Michael A. Lange
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Interdisciplinarity is nothing new. The earliest attempts to understand, organize, or codify knowledge and learning were infused with what today look like interdisciplinary thinking and approaches. Indeed, interdisciplinarity only makes sense if it is preceded by some system of disciplines that perceive themselves and/or are perceived to be separable and bounded. There have to be lines to transcend, categories to move between, before something can be "inter-" anything. So to call the education of philosopher kings in Plato's *Republic* interdisciplinary is a bit anachronistic, as the current forms of interdisciplinarity are rooted in the post-Enlightenment and modern divisions within academia, well post-dating Plato. It was in that post-Enlightenment moment when disciplinary beliefs and practices made the biggest leap toward becoming disciplinary identities as well.

There are many situations wherein something *you do* becomes something *you are*. Innocuous examples abound, such as "I'm a cross-country skier" or "I'm the class clown". Other forms of this kind of identification are more entrenched in the public discourse of some cultures, such as occupational identity. It is a cliché that the second question asked, after names, at British cocktail parties is, "where are you from?", while in the US, it is, "what do you do for a living?" Occupation, a thing *one does*, becomes a fundamental portion of identity, who *one is*. The academic equivalent traditionally was to build one's identity around the discipline of one's terminal degree and/or the department in which one worked. So, to teach or research sociology meant that one was a sociologist, and vice versa. That system works clearly and well when degrees and departmental hirings line up, and when scholars have singular disciplinary identities.

What, then, is the identity of interdisciplinarity? If the discipline is the locus of academic identity, from where does an interdisciplinary scholar draw their sense of self? Much has been expressed, in this and many other journals, in books, in conference papers, panels, and hallway chats, about what interdisciplinarity is, where its place in the terrain of academia is. Less has been said about the inhabitants of that interdisciplinary terrain, though. Whether one is trained as an interdisciplinarian or works in a cross-, multi-, inter-, or trans-disciplinary space, the links between what *one does* and what *one is* remain. So are there differences among someone who is interdisciplinary, someone who is an interdisciplinarian, and someone who works interdisciplinarily?

Note the parts of speech in that last sentence…adjective (interdisciplinary), noun (interdisciplinarian), adverb (interdisciplinarily). Many people think of identity as fixed, as a noun. Thus, a statement like, "I'm a cross-country skier", or "I'm a sociologist". Because the word 'identity' itself is a noun, it is an easy assumption that the thing being designated – *an identity* – is also a noun. Fixed in form, permanent object, subject of sentences, a thing to which other nouns can and must relate, must understand their position relative to. Identities are often thought of in this fixed way, and therefore having places. What is the locus of my identity? Academically, history is that which occurs in a history department or in history journals. A historian is someone who gets their degree from such a department, works in such a department and/or publishes in such journals. Nouns have places, and identity is a noun, ergo…identity is a noun, a thing that exists in particular places, right?

Well, as it happens, no. Identity is not a thing you *have*, rooted in a place, nor is it just a thing you *do*, occurring in a place. It is an amalgamation of many inputs and interpretations of signals sent out and received, filtered through multiple epistemological lenses and influenced by multiple habituses. Constant negotiations occur between and among actors, layers of interpretation affecting the meanings that those actors assign to behaviors, beliefs, and artifacts. If I go onto a *Star Trek* fan site and make a statement about my favorite *Trek* captain, it won't be long before someone questions the validity of my fandom. How can any real *Trek* fan prefer Archer over Janeway?? The question of which captain is better (an adjective) becomes inextricably bound to the question of who is the more proper fan (a noun). Whose opinion is more properly (an adverb) formed becomes a fight over who is a more legitimate opinion maker (a noun). The resultant comment-section flame war becomes an argument about who rightly can claim the mantle of, the identity of, *Trek* fan because enjoying (a verb) *Star Trek* is conflated with being a fan (a noun) of *Star Trek*. If one pulls out of the comments section, though, and analyzes what the various actors are saying,

being, and doing, then the rest of the grammatical possibilities become obvious.

Identity is the result of several things *being done*, often by multiple entities. At best, it's a side effect of all that action. Identity is not a noun with singularity; it is an uncontrollable (at least by any one entity) result of a lot of verbs, nuanced by adjectives and adverbs, occurring between and among many nouns. There are even a few prepositions (denoting relationality) and articles (expressing specificity) thrown into the process, just to complicate it a bit more. As frivolous as science fiction fandoms may seem, academia does not operate all that differently at times. It is too simplistic to say that an academic debate occurring in the pages of a journal or the meeting rooms of a conference is just like an internet comments section. The two situations have many important differences. However, they are both instances of communication, held among various actors with their own epistemologies and habituses, and on that level at least, they operate the same. Different schools of thought rooted in different theories or theorists (nouns, all), engage (a verb) with one another to formulate the best, most valid, most repeatable, most useful (a string of adjectives) analyses that are most appropriate situationally (an adverb). Interdisciplinarity, with a broad view and openness to varying interpretive frameworks, ought to be more able to think of itself through these different grammatical lenses, but it, too, often becomes solely an identity-as-noun. An interdisciplinarian. Interdisciplinary studies. An interdisciplinary approach. To be sure, these categories are useful and sometimes necessary. They are not, however, the only way to understand interdisciplinarity.

Given identity's grammatical (and conceptual) complexity, I ask again – what, then, is the identity of interdisciplinarity? To what extent is interdisciplinarity a thing one has, to what extent is it a thing one does or has done at them, to what extent is it a way of doing things? Is it adverbial, an approach to research or teaching actions that gives them a particular form? Is it prepositional, a way to relate to a subject of study, to understand one's position in relation to that which is being explored?

It is possible, even desirable, to separate an interdisciplinarian-as-noun from the notion of doing something interdisciplinarily-as-adverb. It is possible to look at interdisciplinarity as a thing we have, as well as a thing we do. In order to dig into these nuances, this special issue of the *Journal of Interdisciplinary Studies in Education* explores how the different parts of interdisciplinary academia influence one another. When someone does interdisciplinary research, how does that inform their teaching? If someone teaches an interdisciplinary class, how does that reshape their approach to university or community service? Much of the work published in the field of interdisciplinary studies focuses on teaching, or research, or collaboration, or even university service. But there is vanishingly little on how those different aspects of being an academic are affected across these categories by having

an identity as an interdisciplinarian. By looking at the different categories together, as well as moments of crossover influence between categories, this issue hopes to expand the conversation, to move it from a search for nouns and loci. Looking at influence can help us understand the verbs, adjectives, adverbs, and prepositions that also describe and define interdisciplinarity.

Toward that end, this special issue of *JISE*, "Next Steps: Research, Pedagogical, and Collaborative Outgrowths of Interdisciplinary Teaching", collects articles that touch on moments of crossover. Static versions of identity come alive and gain motion when discussing how a research methodology influences classroom preparation. An analysis of an interdisciplinary curriculum developing over the course of time demands that nouns and verbs interact, giving us a chance to see influence and shape, adjectives and adverbs. The sense of flow, of cause and effect, that is inherent in such discussions at the very least puts nouns into sentences, and breathes animation and process into our view. In so doing, we can understand what all goes into the various ways one can have interdisciplinarity as a part of their identity.

This issue includes submissions from a range of perspectives, covering a variety of topics. Rizk explores interdisciplinary research methods that can be used to foster communication and understanding between different kinds of policy makers in education. NGOs, educational boards, and local communities each make knowledge in their own ways, and by trying to understand those different knowledge making processes from the bottom up, better communication can be fostered, resulting in better education systems, norms, and processes. Looft and Myers turn an interdisciplinary, multi-modal research lens back onto the classroom itself, in this case the university honors program classroom. By examining student reactions to team-taught classes, the authors attempt to better understand how interdisciplinary research can inform the teaching of an interdisciplinary curriculum. Pauley and McKim explore the interdisciplinary potential in the field of agriculture, food, and/or natural resources (AFNR), and its use in delivering interdisciplinary education. Azizah and Sugirin discuss the value of environment-based education in junior high schools, and explore how such educational practices can be improved through researching pedagogically successful and less successful tools. Novotny analyzes the concept of the "maker", and how understanding that practice and identity can shape a pedagogical approach to an interdisciplinary general education curriculum at the university level. Yu and Peters turn an interdisciplinary research lens onto the classroom through the eyes of international students, to help inform teachers and advisors of the particular challenges of the integrative classroom for international students. Dennis explores the very root of interdisciplinarity as an identity, by looking at how we conceive of, and subsequently communicate, interdisciplinarity through metaphor and other types of expression. These communications

inform our own understandings of ourselves, as well as how we interact with colleagues and students to form and teach interdisciplinary education. Mendes, Leandro, Campos, Mónico, Parreira, and Gomes discuss a multi-disciplinary pedagogical framework that transcends literature and embodied teaching, to explore impacts on the values and wellbeing of students, teachers, elders, and parents. Brandenburg and Kelly propose a new centering mechanism for general education by foregrounding interdisciplinarity and integration. With integration at its core, a new approach to general education at the university level can prepare students for the increasingly multiple and varied world they are about to enter. Newell and Luckie also turn their analytical lens onto the interdisciplinary practitioner, by researching how interdisciplinarians think about their own learning and teaching.

In memoriam

As many of the readers of JISE will know, William Newell, co-author (with Douglas Luckie) of one of the articles in this special issue, died recently after a long and distinguished career in Interdisciplinary Studies. Their article was submitted shortly before William Newell's death, giving that piece an unfortunate layer of added resonance. An article in a journal is a poor tribute to any scholar, especially one who has been so important, for such a long time, to their academic field. So I will not pretend that that article, or this statement, is such a tribute. It is simply not enough of an honor for the likes of William Newell. This entire special issue is, however, evidence of the depth, breadth, and pervasiveness of his influence. Our tributes should be continuing to be the intellectual troublemakers he envisioned interdisciplinarians to be.

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Pedagogy for Interdisciplinary Habits of Mind

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ABSTRACT

Teaching interdisciplinary courses requires instilling interdisciplinary habits of mind by using strategies for active learning and reflective thinking. This publication emerged from discussions and surveys used to evaluate interdisciplinary habits of mind and pedagogies drawn from different disciplines. Prior to face-to-face discussions, surveys were sent to 75 expert faculty who had great experience teaching IDS courses. The breakout discussions were observed, transcribed, and analyzed. After analysis, the authors came to three conclusive inferences: (1) Course organization and structure have an important albeit indirect effect on pedagogy, (2) traditional pedagogies have an important role to play in teaching interdisciplinary courses, and (3) active learning is especially important in interdisciplinary pedagogy, not just a supplement.

Keywords: active learning, interactive practice, interdisciplinary, teaching

INTRODUCTION

We start with the presumption that teaching interdisciplinary courses requires instilling interdisciplinary habits of mind. These habits of mind have been identified over the last half-century by faculty members experimenting

(in the non-scientific sense of the word) with different pedagogies for interdisciplinary undergraduate courses (Haynes 2002; Smith & McCann 2001). Often these have been general education courses where the focus was on learning outcomes more than on particular subject matter. The pedagogies that seemed to produce the most desirable habits of mind were the ones that got repeated and tweaked. ('Seemed' because the evaluation of most of these "experiments" tended to be casual and subjective, but also because interdisciplinary habits of mind are notoriously difficult to measure.)

The interdisciplinary habits of mind identified through these trial-and-error pedagogical experiments have largely remained at the level of what Michael Polanyi (1958) calls the "tacit knowledge" of individual teachers or teaching teams, though some have been shared with interdisciplinarians at other institutions in venues such as the annual conferences of the Association for Integrative Studies, the Association for General and Liberal Studies, and kindred professional groups. Even then, the focus of such presentations has been usually on the pedagogies employed to instill these, not so much on the habits of mind themselves. Little attempt has been made to collect, organize, and codify either the interdisciplinary habits of mind or the pedagogies used to promote them.

As we prepared to serve as co-discussion leaders for the CONFERENCE session on interdisciplinary pedagogy, we decided to take advantage of the wealth of practical knowledge of interdisciplinary teaching represented at the conference by enlisting conference participants in identifying pedagogies that promote interdisciplinary habits of mind. We started by sharing with the roughly 75 pre-registered conference participants a random order list of interdisciplinary habits of mind developed by the first author from years of attending national conferences on interdisciplinary studies as well as from serving as consultant and external reviewer on interdisciplinary higher education. We asked the prospective CONFERENCE participants to propose additions, deletions, or corrections to the list, which we then revised. Next, we organized the list into categories representing four generally recognized parts of the interdisciplinary process (Repko 2012), i.e., drawing, modifying, integrating, and evaluating insights drawn from different disciplines. The revised and categorized list of interdisciplinary habits of mind was then shared with participants at the conference. Participants were assigned to separate breakout sessions, and asked to discuss two questions announced prior to the conference: (1) What pedagogical techniques are useful in promoting each core habit of mind, and (2) How do they work?

RESEARCH METHOD

Four separate breakout groups independently arrived at similar strategies for discussing these questions. They focused on the four categories of habits of mind one by one, identifying pedagogies useful in promoting any or all of the habits of mind within each category, and using discussion of how each pedagogy works to clarify how it produces such habits of mind, essentially vetting it. The discussion leader listed clarified and vetted pedagogies under each category—drawing, modifying, integrating, and evaluating—on the whiteboard or Post-it notes (which we photographed immediately afterwards). Student assistants took notes as well on the discussion in each breakout session, and those notes were shared with us following the conference. And a representative of each breakout group reported the results of their discussion in a plenary session that followed immediately (which we recorded). Afterwards, we transcribed and coded this information as data for analysis. The resulting tables, figures, and word cloud can be found in the appendix.

RESULTS

Table 1 presents the list of interdisciplinary habits of mind vetted by CONFERENCE participants. This list should be of use in its own right to faculty and administrators designing, administering, and assessing general education requirements and the interdisciplinary courses meant to fulfill those requirements.

Table 1: Interdisciplinary Habits of Mind

1. Drawing insights from diverse perspectives into complex issue
• Strive for adequacy in (the narrowly relevant concepts and theories of) each discipline, as well as a feel for its perspective.
• Seek out diversity of perspectives for richer and more comprehensive understanding.
• Identify perspectives and knowledge in relevant interdisciplinary fields.
• Identify pertinent knowledge and information in diverse disciplines and fields using digital technologies.
• In interdisciplinary collaborations, be alert to relevant approaches of other team members and their disciplines.
2. Evaluating insights

• Assume every disciplinary perspective has at least a kernel of truth.
• Assume whatever you're attempting has probably been tried before, at least in part.
• Proceed methodically even though the disciplines from which you draw employ different methods.
• Bracket and set aside/suspend personal convictions.
• Recognize all sides of an argument, avoiding overstatement and overconfidence.
• In evaluating disciplinary insights look for strengths in arguments you dislike and weaknesses in those you like.

3. Modifying insights
• Seek commonalties not compromises, i.e., win-win situations (in modifying and integrating insights.)
• Think holistically, contextually, and systemically.
• Think dualistically, i.e. either/or (in drawing insights from disciplines) but also inclusively, i.e. both/and (in integrating their insights).
• Embrace contradiction--ask how it can be both.
• Use the techniques for creating common ground in adjudicating conflicts in disciplinary insights.

4. Integrating insights into comprehensive understanding of issue
• Look for unexamined linkages and unexpected effects.
• Seek unanticipated effects by re-contextualizing: look at different time frames, scales, and cultures.
• Expect multiple causes and effects.
• Resist urge to assign numbers to things not inherently quantitative, especially if they can be viewed differently from different perspectives.
• Don't fall in love with a solution until you understand the full complexity of the problem.
• Strive for balance (among disciplinary perspectives).
• Integrate as you go (instead of waiting for all discipline's insights).
• Value intellectual flexibility and playfulness.
• Seek understanding responsive to contributing theoretical perspectives and empirical patterns of behavior.
• In constructing comprehensive understanding be responsive to all perspectives but dominated by none.
• Persuade your audience with evidence not claims, note that disciplines have different standards of evidence.

Because the habits of mind are grouped according to the part of the interdisciplinary process in which they are developed, the table can contribute to discussions of interdisciplinary process. The habits of mind listed under each part of the interdisciplinary process—drawing, modifying, integrating, and evaluating insights from different disciplines—can be used to clarify the intellectual activity that takes place in each, grounding otherwise abstract discussions of interdisciplinary process in educational outcomes. Even researchers on interdisciplinary teams, especially those new to interdisciplinary studies, may find the list useful as a check on the interdisciplinarity of their research.

Table 2 lists pedagogies identified in any of the four participating breakout sessions as useful in promoting the habits of minds associated with each part of the interdisciplinary studies process, as well as in Table 3 pedagogies more widely applicable to interdisciplinary courses as a whole. This rich smorgasbord of pedagogies should be of interest to faculty teaching interdisciplinary courses as well as to staff and consultants preparing faculty development workshops on interdisciplinary teaching.

Table 2: Pedagogies Promoting IDS Habits of Mind

1. Drawing insights
    a. Teaming diverse student backgrounds
    b. Modeling different perspectives via team teaching
    c. Topics that necessitate ID approaches (guest lectures, hot topics)
    d. Rewarding risk taking (encourage perspectives even if seems naïve)
    e. Scaffolding with case studies
    f. Repetition of the incompleteness of insights/resolution
    g. Explicitly identify the perspective behind each insight
    h. Tying explicitly to earlier discussion
    i. Bringing in faculty from different disciplines to explain how they approach a problem
    j. Using real world examples
    k. Dialogue between team teachers
    l. Leading with theory (which helps students engage with different disciplinary models/questions without negotiating with a whole disciplinary paradigm or mischaracterizing them)
    m. Creating dialogue between advanced students from 2 or more disciplines (which helps make explicit the commonalities/differences between disciplines)

n. Choosing the issue and identifying relevant bodies of knowledge (which helps students make connections between disciplinary models, and build on these connections in applying research
o. Using role playing or charades (to help students detach from their own perspectives in non-threatening ways and imagine other ways of thinking about an issue, event, or position)

2. Evaluating insights
    a. Recognizing whether an insight is relevant
    b. Having a good rubric and sharing it with students
    c. Peer evaluation
    d. Literature review
    e. Successful and failed examples of disciplinary efforts
    f. Recognizing what you need to know for definitive evaluation
    g. Putting a range of convictions on the table before bracketing them
    h. Online facilitation
    i. Clicker-based responses
    j. Devil's advocate assignment
    k. Double edged pharmaceutical exercise
    l. Presenting both sides or taking opposing positions
    m. Modeling their evaluation
    n. Dialogue (maybe modifying or even integrating it)
    o. Phenomena, e.g., drawn from Szostak's list of phenomena (Repko 2012, pp. 106-110) that influence the problem and inform the analysis
    p. Structuring assignments (focusing on IDS methodology and disciplinary perspectives before undertaking the project)
    q. Teamwork fostered by assignments that stimulate rich interaction among students
    r. Assignments that articulate the role of disciplines
3. Modifying Insights
    a. Assignment to design and justify course syllabus
    b. Model UN
    c. Role playing
    d. Academic controversy (debate, class discussion)
    e. Concept maps

f. Presenting range from bargaining and negotiation to alternate dispute resolution
g. Instructor models IDS process
h. Guest lectures representing authentic perspectives, including voices outside academy that present competing arguments
i. Case studies that present unintended consequences
    i. Historical or current events – the latter are much more powerful – can relate to students lives more efficiently
j. Panels of experts who can present multiple perspectives and can help students compare/contrast assumptions and arguments to
    i. Get away from binary thinking that is common in debates
    ii. Help students understand how they frame questions and seek insights
    iii. Ask or modifying questions, uncover assumptions and arguments by comparing/contrasting controversial arguments
    iv. Show students multiple perspectives based on different assumptions/evidence.
    v. Support finding common ground

4. Integrating insights
    a. Capstone seminars
    b. Film festival- or other concrete referrals
    c. Summative public product
    d. Draft NIH/NEH/NSF RFP
    e. Recognizing and incorporating reality
    f. Write short story that demonstrates integrated understanding
    g. E-portfolios that connect elements with narrative
    h. Shared inquiry (from great books, questions without answers)
    i. Multiple drafts with feedback, including face to face meetings
    j. Creativity exercising
    k. Systems modeling
    l. Teamwork/collaborative points

m. Case studies that introduce and revise assumptions, arguments and finally propose a different or extended argument
n. Unintended consequences revealed in those case studies
o. Annotated bibliographies that offer students a range of perspectives that they have to group and then integrate, e.g., 30 papers selected that student groups must annotate and share and then sort by theme and integrate
p. Uncovering bad arguments, e.g. from case studies, and re-envisioning them, and using cognitive dissonance to encourage students to revisit their assumptions

To make comparisons of pedagogies across the four breakout sessions, each of which developed its own labels for pedagogies, we identified key common features of pedagogies mentioned in different sessions. For example, "teaming diverse student backgrounds," "creating dialogue between advanced students from 2 or more disciplines," "peer evaluation," "teamwork," "teamwork/collaborative points," "role playing guests and students," collaborative work," "concept mapping—in teams," and "small group collaboration in person and online" were all coded as "group work." (Each of those pedagogies could also be coded under another commonalty as well, e.g., "teaming diverse student backgrounds" was also coded as "forming heterogeneous streams," and "peer evaluation" was also coded as "peer review.") By identifying common features in pedagogies, we were able to determine which were identified in more than one breakout group and the frequency with which they were identified.

Table 3: Overarching Pedagogies for Integrative Learning

Overarching Pedagogies
1. Policy debate a. Role playing guests and students b. Case studies c. Problem based learning d. Collaborative work e. Critical thinking exercise f. Writing exercises

2. Literature Review
    a. What does authority of different disciplines say?
    b. Debates and restate another's argument
    c. Clashing viewpoints
    d. Editorials and then literature review
    e. Then reflection
3. Challenging multiple assumptions, critical reflection
    a. Take people out of their comfort zones
    b. Confront evidence
4. Synthesis: What's in the house?
    a. Active pedagogies
        i. Problem based learning
        ii. Case studies
    b. Attention to process
    c. Critical reflections
    d. Blurring boundaries of what and how
5. Concept mapping – in teams
    a. Small group collaboration in person and online
    b. Structures syllabi cycling through multiple disciplinary perspectives
    c. Done through digital, collaboration, small groups, re-visiting topics and ideas
6. Case studies
    a. Bring complexity to the classroom
    b. Connect across courses
7. Guest lectures/mixed faculty
    a. Lining case studies
    b. Followed is appropriate reflection and assessment
    c. "Only the first step"
8. Mixed classes
    a. Students bring their own diverse perspectives to discussion
    b. Use inherent diversity in the classroom not just disciplinary

9. Open discussion
    a. Need modeling common ground
        i. Need to know what disciplines look like (underlying – can use role playing of stake holders disciplines)
    b. Intentionality and being explicit
        i. About what "it" is > reflexive about teaching/learning process
        ii. In team teaching
    c. Identifying limits and strengths of disciplines into context
    d. Embracing tensions
10. More open discussion
    a. Need skills of comparative thinking, methodology
    b. Accepting uncertainty, partiality
    c. Sharing/modeling yourself the and the process of revising
    d. Exposing your thought process
    e. Demonstrate multiple perspectives on the same entity

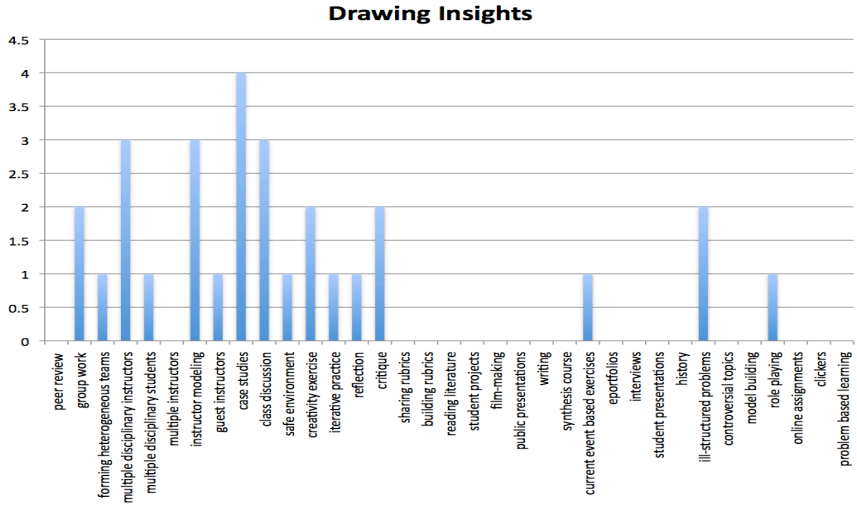

Figure 1.

Pedagogies for Drawing Disciplinary Insights.
Expert faculty groups created lists of best practices appropriate for each stage in fostering students' interdisciplinary behaviors or habits of mind. The authors developed a coding system and coded all data. For each stage software identified the frequency with which common coded features of pedagogies were recommended by expert faculty breakout groups for each part of the interdisciplinary process.

Figures 1 (Drawing Insights), 2 (Evaluating Insights) 3 (Modifying Insights), and 4 (Integrating Insights), identify the frequency with which common features of pedagogies were recommended by breakout groups for each part of the interdisciplinary process. Features of pedagogies that were independently identified by more breakout sessions presumably deserve more attention from faculty members trying to decide which pedagogies to try out in their interdisciplinary courses. Moreover, cursory comparisons of Figures 1-4 make it clear that different pedagogies are useful in different parts of the interdisciplinary process. While the different kinds of thinking required in different parts of the interdisciplinary process have been identified previously (Newell 2007), this is the first empirical validation that different pedagogies are therefore required in different parts of an interdisciplinary course.

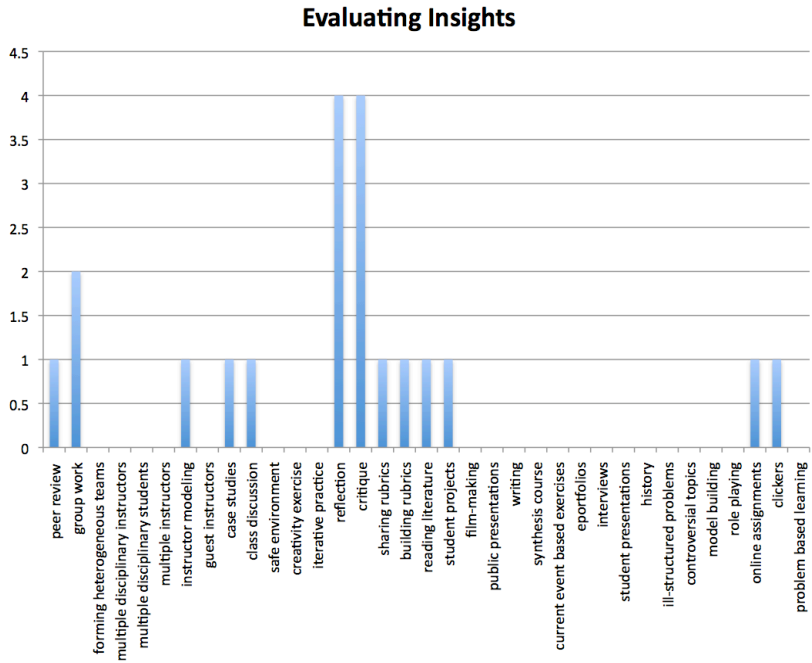

Figure 2. Pedagogies for Evaluating Disciplinary Insights. Expert faculty groups created lists of best practices of pedagogies appropriate for the stage of Evaluating Disciplinary Insights of Habits of Mind. Software identified the frequency with which coded pedagogies were recommended by expert faculty.

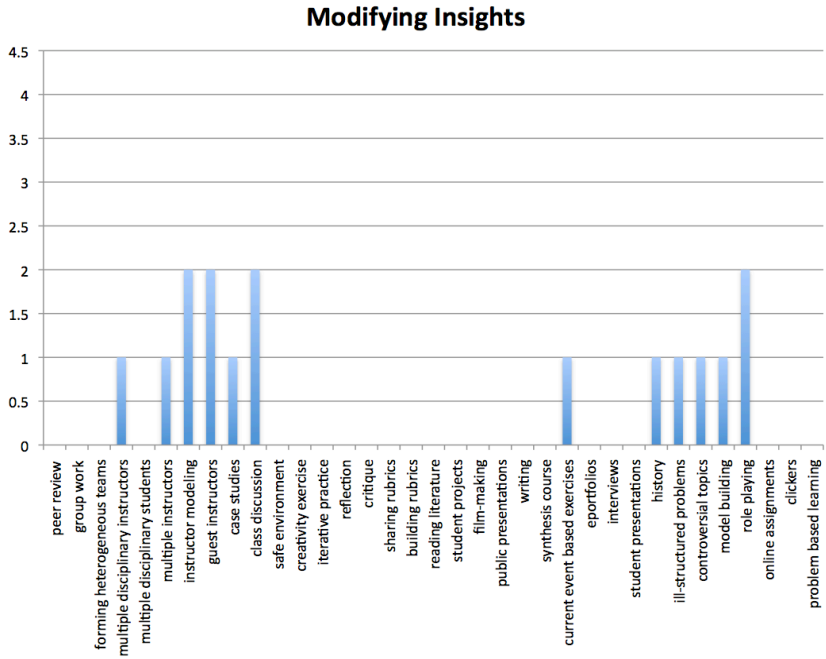

Figure 3. Pedagogies for Modifying Disciplinary Insights. Expert faculty groups created lists of best practices of pedagogies appropriate for the stage of Modifying Disciplinary Insights of Habits of Mind. Software identified the frequency with which coded pedagogies were recommended by expert faculty.

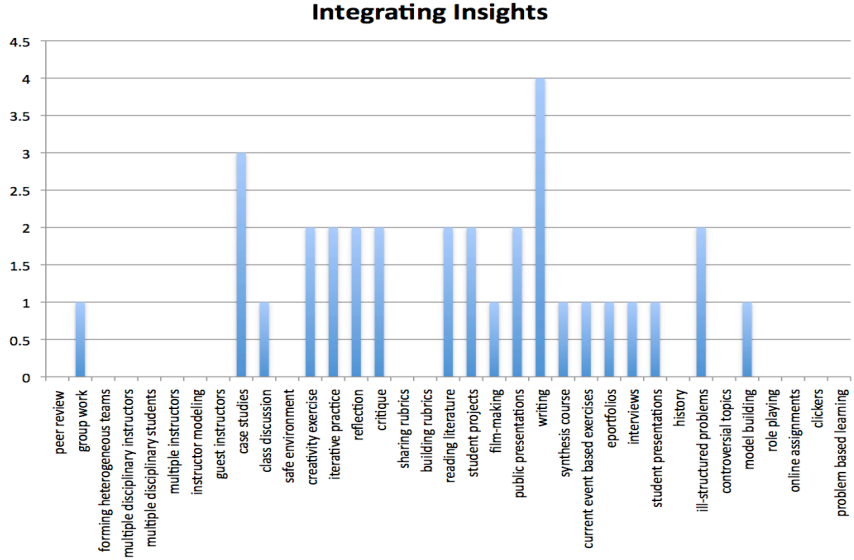

Figure 4. Pedagogies for Integrating Disciplinary Insights. Expert faculty groups created lists of best practices of pedagogies appropriate for the stage of Integrating Disciplinary Insights of Habits of Mind. Software identified the frequency which coded pedagogies were recommended by expert faculty.

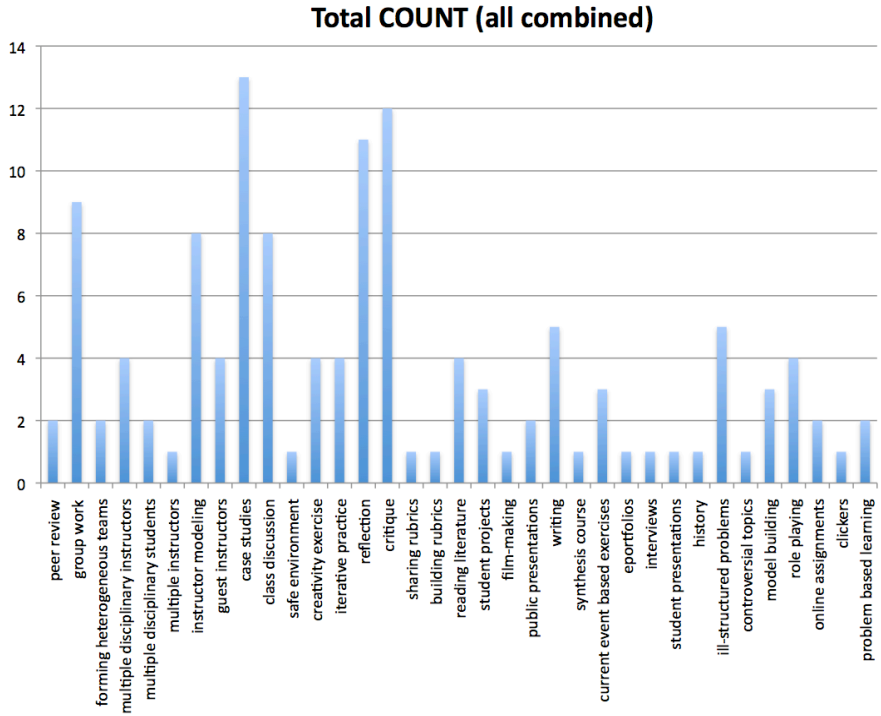

Figure 5. General Best Practices in Interdisciplinary Pedagogy. The data depict the frequency with which key components of pedagogies were recommended by expert faculty for the interdisciplinary process as a whole.

Figure 6. Word Cloud of Interdisciplinary Pedagogies. This word cloud is a weighted word list where font size and color was used to visually model frequency. Faculty groups created lists of best practices of pedagogies appropriate for Interdisciplinary Studies and Habits of Mind. Word Cloud was generated with Jonathan Feinberg's Wordle™ (www.wordle.net) software, which mined comments of instructors and represents high frequency usage of terms with increased font size. These are pedagogies recommended by expert faculty.

Figure 5 (General Best Practices) depicts the frequency with which key components of pedagogies were recommended for the interdisciplinary process as a whole. The 17 pedagogical components recommended most frequently (3 or more times) deserve special recognition. These can be organized and categorized into three groups as follows: A. Overall course structure/organization (instructors from multiple disciplines, guest instructors, and case studies that are current event-based and ill-structured), B. Active learning (group work, creativity exercise, interactive practice, role playing, model building, and student projects), and C. Traditional liberal arts pedagogies (reading the literature, critique, reflection, class discussion, writing assignments, and instructor modeling). What distinguishes this categorized list of pedagogical best practices in interdisciplinary teaching are: (a) It was compiled and vetted by multiple groups of teachers from a variety of institutions; (b) It is grounded explicitly in educational outcomes, namely interdisciplinary habits of mind; and (c) It is consciously embedded in interdisciplinary process.

DISCUSSION AND CONCLUSIONS

From the categories of general best practices, we draw three basic inferences: (1) Course organization and structure have an important albeit indirect effect on pedagogy. I.e., pedagogy is something faculty members have to think about as they conceptualize and design a course, not just as they prepare for each class period. (2) Perhaps because interdisciplinary studies is grounded in traditional academic disciplines, traditional pedagogies have an important role to play in teaching interdisciplinary courses. (3) Active learning is especially important in interdisciplinary pedagogy, not just a nice contemporary add on. In part this may be because interdisciplinarity requires non-traditional as well as traditional thinking; in part, it may be because the central objective of interdisciplinary courses is not to fit students into the status quo but to empower them to function effectively in a complex evolving world. Finally, Figure 6 (Word Cloud) offers a visual representation of the key features of pedagogical best practices in interdisciplinary studies.

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Integration as the New (General) Education

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ABSTRACT

The authors articulate how the contemporary realities of higher education do not square with its existing structures. Specifically, the disciplinary siloing of knowledge inhibits our ability to sponsor learning experiences that prepare students to solve complex problems. The authors contend that allowing for the primacy of integration is a way to answer questions about the worth of a college degree from an increasingly skeptical public concerned about higher education's utility. Integration, the article contends, provides a bridge between the growing trend of higher education as vocational training and more classic forms of liberal arts education that remain an integral part of the academy.

Keywords: Integration, Higher education, General education, Future of higher education, Institutional viability

The story of American higher education in the 21st century is told in many ways. Some versions offer up a transcendental beacon of hope for our collective future prosperity, while other more widely circulated ones read like a faltering tale of desperation and despair. Of course, the truth likely falls somewhere in the middle, which makes sustained efforts to intentionally explore—and reshape—the nature of current and future educational efforts all the more relevant.

The complexity of the contemporary landscape is perhaps best revealed through a short exploration of some of the variables which have contributed to such competing narratives in the first place. On the one hand,

many of the factors that distinguished the American system in the past persist. The enormous diversity in types of institutions, from research universities and residential private colleges, to community colleges, online degree programs, and for-profit options, allows multiple access routes for potential students. As Derek Bok (2013) notes in his book Higher Education in America, our typical conception of the residential undergraduate college experience now accounts for less than 20 percent of students enrolled. For the rest, higher education is obtained through commuter pathways, part-time, later in life, or online. From this perspective, the opportunity for the public to benefit broadly from educational offerings and engage in life-long learning has perhaps never been stronger. With increased potential access, the diversity of individuals who can receive a college degree theoretically expands, and a greater swath of the population can enjoy the accompanying economic prosperity while actively and meaningfully contributing to the advancement of society writ large. This is the dream of higher education for the public good.

On the other hand, with a college degree becoming the new high school diploma as a prerequisite for gaining entrance into the majority of career fields (and additional credentials required for upward career mobility), the pressures to attend--and the impact upon those who don't (or can't)--become magnified. The costs of earning a degree are escalating, and the burden of this reality is increasingly borne by individual students and their families as sources of public support dry up. As a result, the promise of increased access remains unrealized, and the importance that degrees translate into practical individual economic advantages, as opposed to some idealized form of an informed and engaged citizenry, takes precedent. Nowhere is this more obvious than on the United States Department of Education's College Scorecard, which features "salary after attending" as one of the top 3 criteria by which to judge a particular institution. Teaching with integrity in an environment that privileges future earning power over other important but less easily measured metrics can be a challenge.

Finally, there is a growing awareness that the biggest problems we face on a local, national and global scale are increasingly complicated--or "wicked," as described by Brown, Harris, and Russell (2010). Creating just and sustainable communities, tackling environmental threats, building comprehensive and inclusive global partnerships for peace—these are just some of the critical imperatives for the 21st century. Solving such issues will require broad-based, multi-faceted, inclusionary and collaborative efforts. The narrow expertise of a few elite and highly educated individuals can no longer sustain our future collective prosperity. We need all hands on deck, and in this regard, higher education plays a critical role. The same is true on a smaller scale in the professional world of the 21st century. The kinds of problems to be tackled and decisions that need to be made in professional settings increasingly require complex skill sets that don't neatly align with predefined academic disciplines or technical training programs. In order to

fulfill higher education's dual promise of personal and societal growth, the entire enterprise may need some remodeling.

How can we make sense of these realities in a way that helps to inform what we actually do on the ground within the academic institutions where we work? First off, we can begin by acknowledging that these complexities are real and worth paying attention to. As educators, we have a responsibility to respond to the challenges of how higher learning can—and should—most effectively serve societal needs. In order to meet the challenge, colleges and universities may have to shift their own structures to function differently than they have in the past, and be willing to explore modified approaches to historically entrenched disciplinary perspectives.

Once we accept that external world realities might necessitate internal institutional and academic accommodations, we can begin to reimagine what we do given the new context. Finally, we can embrace the idea that through experimentation, flexibility, and a willingness to reshape our own assumptions about disciplinary identities, we might discover more appropriate and meaningful approaches to the kinds of thinking, learning and teaching that the world needs most.

The ideas we propose here have grown out of our own particular experiences over the past 10 years at one small, private, professionally-focused institution. When considering the differences between a professionally-focused college and a trade-school, situating professionalism within broader societal and cultural contexts and offering a holistic education that not only prepares students to be successful in the workplace, but more importantly, to be thoughtful contributing members of society, becomes paramount. For us, an intentional approach to this form of professionally-focused higher education began with reconfiguring the liberal learning students were exposed to as part of their general education requirements. But this reconfiguration turned out to be just the beginning of the longer, ongoing evolutionary story that has led us to embrace the notion of integrative teaching and learning as the very core of what ought we do.

In 2007, following Champlain College's shift from a primarily two-year degree granting school to a bachelor's and master's degree-granting institution, its approach to general education was fundamentally changed. Gone were the days of menu-driven general electives; in their place came a common, scaffolded, liberal arts Core designed to complement the educational experience for all students, regardless of profession focus. In keeping with our goal of creating a practically relevant and cohesive experience, interdisciplinarity was adopted as the defining feature of the new curriculum, and discipline-specific faculty members were required to adapt accordingly by using interdisciplinary teaching and learning techniques in the classroom.

Two components of this curricular reconfiguration were critical to our evolving understanding of integrative theory and pedagogical practice. First, as the interdisciplinary curriculum unfolded, the majority of faculty teaching in the Core had limited interdisciplinary experience. And second, as it was designed to support and enhance the professional major programs, the relevance and interconnectedness of the Core to those programs was frequently challenged. This meant that we had to repeatedly question our assumptions, adopt new terms and definitions, and reformulate our approach in the classroom to fulfill our goals. Courses were revised, new faculty with true interdisciplinary expertise joined the division, some elements of student choice were reintroduced, and a greater emphasis was placed on learning outcomes and program goals versus particular subject-matter and common content. Over time, this fluidity has led to a reconceptualization of what we do and how we do it, to the point that calling our curriculum truly "interdisciplinary" is probably a misnomer. What we actually are trying to teach students, through the version of liberal learning that we provide, is the ability to ask important and complicated questions and seek answers informed by a multiplicity of perspectives that transcend the confines of classic academic silos. This can occur without sacrificing rigor, but by applying rigor to contexts beyond the walls of the ivory tower. In the professional education battle between the swamp dwellers and the high ground, as articulated by Donald Schon (1983), we have ultimately chosen to take both sides.

It's important to note two important caveats here: 1) We don't aim to delegitimize the importance of disciplinary expertise in higher education. Without academics doing the Germanic model of scholarship that's dominated our universities for the last century and a half, higher education could not compete with industry in terms of innovation. 2) We take a parallel stance when it comes to undergraduate teaching as well. However, we are also suggesting that integrative teaching and learning can be a powerful tool for exploring the expanding perspectives on contemporary world issues that academics should be caring about, especially if their work is to be discernible to the publics they serve. Put differently, regardless of the specific question at hand, we believe Integration (with a capital "I") must be part of the answer.

So what exactly do we mean when we say "Integration?" Integration as a tool to invite multiple perspectives into the scholarly conversation is based on the idea that academic fields bounded by a particular canon or epistemology have inherent constraints that make incorporating unconventional perspectives into the discourse much harder. In contrast, Integration (both in terms of how we do scholarship and how we teach) is an inclusive opportunity to rethink how we create knowledge and perform teacher/scholar. At a time when the practical relevance of a college education supersedes learning for learning's sake, Integration provides a compelling alternative narrative for understanding the important role liberal learning and multiple disciplinary perspectives can play. We believe adapting to the

contemporary needs of society can best happen through an open, collaborative, and inclusive integrative approach.

In her essay, "Beyond Interdisciplinarity: Expanding the Horizons of Integrated Learning," Julie Thompson Klein (2015) traces the evolution of theorizing interdisciplinary and integrative learning. From William James, to Great Books advocates, to the formation of the Association for Interdisciplinary Studies nee Integrative nee Interdisciplinary Studies, Thompson Klein effectively demonstrates how scholars who are interested in the ways disparate disciplinary knowledge fit together to make better sense of the world have been working in close concert with one another for a long time. For Klein, going "beyond interdisciplinarity" started with the idea that integration and interdisciplinarity were "inseparable but not identical;" an assertion that we, for all practical purposes, agree with.

We agree with the assertion not because we dismiss contributions like Allen Repko's important work on the nature and form of interdisciplinary research, but because being heard in a crowded higher education landscape requires us, as practitioners of the liberal arts, to speak in relative unison about the things we agree upon. The structural realities of most liberal arts departments have contributed to a kind of horizontal violence where humanities programs competitively fight one another for funding and resources instead of having the important collaborative conversations about how professional and liberal education may work in concert. As Repko (2012) himself contended, the problems to be solved are the issue, and the disciplines are "simply a means to that end" (p. 7). For our purposes in reimagining the structure of higher education, it's not just the disciplines that are a means to an end, it's the interdisciplines and the multiple integrative pathways that also serve as tools to help us along the way.

In the midst of budget cuts, program discontinuances and myriad world problems seemingly intractable in their complexity, the distinction between multidisciplinarity, interdisciplinarity, transdisciplinarity and integration don't seem as important as making cogent public arguments championing the utility of combining the liberal arts with professional education. At a time when higher education as a public good has been scrutinized and materially judged as less than worthwhile, Integration as we're defining it is one compelling way to return higher education to the place of relevance that it can and should occupy.

Like Thompson Klein (2015), we believe imagining "quadrangulating integrative learning" (p. 10) to be the next step in the evolution of our understanding. In a refreshingly holistic argument, Thompson Klein contends faculty members trying to facilitate integrative learning need to be conscious of "disciplinary depth, multidisciplinary breadth, interdisciplinary and transdisciplinary integration, and interprofessional cooperation" (p. 10). Put simply, we need the student studying quantum physics to push on the boundaries of what's known in the

field, but we also need the engineer to practically apply her findings as well as the philosopher who weighs the ethical component of uncharted scientific territory. In this example, everyone but the quantum physicist herself has to be able to think integratively at a high level in order to create new knowledge. A deeper exploratory dive will allow us to elucidate each relevant point of the quadrangle and uncover where the proper balance of the four can be found within a professionally-focused curriculum.

Furthermore, we suggest a critical look at how this quandrangulation applies not only to traditional graduate professional education, but to novel undergraduate professionally-focused fields as well. For example, it seems rather obvious that in the realm of healthcare, a physician needs deep disciplinary depth coupled with an ability to integrate knowledge with other professional practitioners (such as nurses, psychologists, social workers, physical therapists, pharmacists, etc.). The ideal physician also has the capacity to understand the complexity of the human condition, a recognition of the structural disparities build into the system which result in widely variable outcomes for various populations, a sense of compassion, and an ability to communicate clearly and effectively with multiple stakeholders. It may be less obvious that the student majoring in game art and animation as an undergraduate needs a parallel set of skills, which include technical expertise, the collaborative ability to work on a production team with writers, designers, and programmers, a broader appreciation for the power of media in culture, and a recognition that their artistic and symbolic representations can have profound societal consequences. Given the fluid nature of evolving professions, careful attention to how best to balance the essential components of an integrated educational experience in a professionally-focused undergraduate context might be even more important if we are to ensure that degrees provide long term sustainable skills and perspectives rather than short term expertise that lasts no longer than the latest career fad.

Even though what it means to do integrative and interdisciplinary work is fraught with multiple definitions and interpretations within sites of higher education and has been for a long time, outside the weediness of academe, the common habits of mind associated with the terms are (for good reason) both publicly palatable and academically reputable. For example, using holistic ways of knowing to approach authentic problems and capitalizing on collaborative expertise to make decisions are two phenomena that are not at all unique to higher education. This is the kind of thinking that smart people in positions of authority and power do (or at least should do) all the time when faced with real problems that need good solving. And it is precisely what thoughtful and meaningful professionalization could look like in the context of American higher education.

The paradoxical reality for most contemporary American college students holds they simultaneously cannot afford to go to college, but cannot afford to forgo college either. According to the Federal Reserve (Board of

Governors of the federal reserve System, 2018), as of June, 2018, student loan debt in the United States exceeded $1.5 trillion. The average amount of student loan debt now exceeds $37,000 (Friedman, 2018), but over the course of a lifetime, today's college graduates can expect to earn 84% more than their non-college graduate peers (Carnevale, Rose and Cheah, 2011). Couple these facts with the idea that our structural beliefs about the importance of a college education have shifted as well. As opposed to considering an educated populace as an overall collective good, we now consider investing in higher education to be a personal choice that individuals elect to do to better themselves and their personal lot. Because it's up to the individual choice of the person pursuing the degree, the argument goes, publicly funding that individual's college degree is low on the priority list for expenditures the general public should spend their tax dollars on. For sites of higher education, this paradigmatic shift has meant that in order to remain solvent, they must primarily serve the individual student as opposed to serving a society made up of a series of individual students. This distinction is subtle, but important--especially for colleges who must compete in a crowded marketplace selling a product few can afford. We use this transactional language intentionally here because it is the inevitable, if unintentional, result of higher education's shift away from the idea that it exists in part to serve the collective good of the communities it serves.

While it's not obvious what this macro-analysis of higher education has to do with anything related to integrative learning, interdisciplinarity or the liberal arts more generally, we argue that these variables are actually inseparable from one another. As a cultural institution, higher education is uniquely positioned to be a site where complex ideas come to be synthesized, theorized and eventually applied. Even though this has historically been understood to be a primary responsibility of the academy, there are two noteworthy differences that we believe are important for our purposes in advocating for an alternative framing for a meaningful 21st century education.

1) Instead of taking a deep esoteric dive into isolated disciplines, higher education must do a better job of prioritizing approaches to problem-solving that emphasize Integration. The complexity of major world problems necessitates sifting through multiple perspectives and academic specializations. This is not a new thought. Historically though, higher education has privileged a Germanic model of isolated pockets of expertise and let the world outside the academy do what it will with the results. In order for higher education to remain a viable way for citizens to spend their money and time, making room for the breadth of integrative work as opposed to just the depth of academic knowledge needs to occur.

2) Because here's the thing--this integrative work already is privileged when people attempt to solve real problems attempt in industry. The fact of the matter is that the type of integrative learning academics champion already happens with a relatively high degree of frequency out

there in the "real" world. Admittedly, it is with some trepidation that, as faculty members teaching in a liberal arts core curriculum, we are advocating for the academy to take some cues from industry, but we believe the following is true: higher education must begin to recalibrate the ways it relates to other sectors of society in order to stay relevant--both culturally and financially. Being able to dialogue with industry will help academic expertise reach a broader audience and also help colleges and universities justify its high cost to students and their families.

At our own institution, we have moved away from our original conceptual design to one which better aligns with our professionally- and globally-focused institutional mission, and we have become more comfortable identifying not as interdisciplinarians, but as transdisciplinarians and integrationists. We now need to further embrace our role in complicating student perspectives regarding what professional education and professional success look like, as we test their assumptions about the workplace through the integrative liberal learning we provide. In this context, our current goal is to figure out how to navigate through authentic self-curiosity and meaningful curricular change in a healthy and productive fashion, while simultaneously communicating the relevance of what we do across all our professional programs.

While we continue to negotiate and navigate the complex terrain of higher education in the 21st century and our efforts to serve the dual promise of what our degree should provide for our students, it is clear to us that "Integration" can provide the theoretically rich soil upon which future growth can occur. From our vantage point, Integration (as opposed to interdisciplinarity) offers the most authentic way for our students to gain a particular career-focused expertise while simultaneously preparing to engage with complex problems that extend beyond the bounds of a discrete discipline or single profession. Put simply, integrative thinking as we understand it has become the common hinge to propel us forward.

We suspect that our experience as professors teaching in an interdisciplinary general education program at a professionally focused school may be broadly applicable to other contexts, given the contemporary realities of higher education. Specifically, our story provides some insight into how the nexus of integrative, interdisciplinary learning, and the increased professionalization of the academy might be applied both out of and inside the classroom. As colleges and universities of all stripes argue for the viability of their offerings, promising the start of a rewarding career is a necessary reality for convincing the public to sign onto the treatise. Fulfilling the promise then becomes part (but not all) of our commitment and obligation as educators. Through Integration, we are attempting to lay the groundwork to do just that, with integrity, and without sacrificing the idealism that drew us into this profession in the first place.

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Interdisciplinary Connections: Evaluating Collaboration between AFNR and Leadership, Mathematics, and Science Educators

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ABSTRACT

Agriculture, food, and/or natural resources (AFNR) content offers a tremendous context for interdisciplinary teaching and learning. Collaboration between AFNR and core content area educators has been recommended to increase interdisciplinarity in school-based AFNR Education; however, existing research lacks an empirical investigation of the relationship between interdisciplinary collaboration and outcomes associated with interdisciplinary teaching in school-based AFNR Education. Therefore, the current study explores the scope of collaboration between AFNR, leadership, mathematics, and science educators and the relationship between collaboration and interdisciplinary teaching in school-based AFNR Education. Findings indicate opportunities to initiate and strengthen interdisciplinary communities of practice through purposeful interactions, especially regarding length of interactions between AFNR and core content area educators. Recommendations for practitioners, teacher educators, and researchers are provided.

Keywords: collaboration; interdisciplinary teaching and learning; school-based Agriculture Food and Natural Resources Education

The Context: School-Based AFNR Education

Under the umbrella of Career and Technical Education (CTE) exists school-based Agriculture, Food, and Natural Resources (AFNR) Education. AFNR Education includes intermediate and secondary-level coursework in agribusiness; animal sciences; environmental service systems; food products and processing; leadership; natural resource systems; plant sciences; and power, structure, and technical systems. In addition, AFNR Education includes two intra-curricular pillars which extend student learning, (a) supervised agricultural experiences – out-of-class, student-directed experiences designed to engage learners in the application of AFNR content (e.g., working for a local farm store, starting a lawn mowing business, conducting research on the yields of multiple corn hybrids) and (b) the National FFA Organization – a career and technical student organization (CTSO) designed for the development of leadership skills and application of AFNR and leadership knowledge through various contests, conferences, workshops, and student leadership positions (Phipps, Osborne, Dyer, & Ball, 2008).

To address the increasingly complex problems (e.g., climate change and food insecurity) plaguing society, future generations must be prepared to enter the workforce with an interdisciplinary understanding of the complex systems which comprise the world (Chettiparamb, 2007; Newell, 2007). Therefore, CTE, including school-based AFNR Education, must be strengthened through curriculum which crosses multiple disciplinary bounds (Handy & Braley, 2012). In a review of existing literature, researchers identified five additional justifications for creating these interdisciplinary learning spaces within AFNR Education; specifically referencing science, technology, engineering, and mathematics (STEM) content integration (Scherer, McKim, Wang, DiBenedetto, & Robinson, 2017). Justifications for including STEM content included (a) increasing core academic learning via the context provided within AFNR curriculum, (b) increasing student interest in STEM and AFNR careers, (c) empowering students with the interdisciplinary perspective needed for emerging careers, (d) preparing problem solvers with the requisite interdisciplinary perspective, and (e) establishing interdisciplinary connections which adhere to the interrelated nature of AFNR and STEM systems of knowledge. In combination, identified justifications provide the rationale for approaching AFNR Education in an interdisciplinary manner.

Scherer et al. are not alone in articulating the importance of interdisciplinary teaching and learning within AFNR Education. In fact,

many suggest the inherent interdisciplinary nature of AFNR systems make AFNR Education the ideal environment for interdisciplinary education in secondary school settings (National Research Council, 2009; Stubbs & Myers, 2015). Within AFNR Education literature, commonly cited interdisciplinary connections are between AFNR, science, mathematics, and leadership. In fact, researchers have explored connections between AFNR and core content areas for over 25 years, illuminating both the importance of, and the opportunities available for, interdisciplinary connections in AFNR Education (Balschweid, 2002; Connors & Elliott, 1994; McKim, Velez, Lambert, & Balschweid, 2017; Morgan, Fuhrman, King, Flanders, & Rudd, 2013; Myers & Osborne, 2005; Newman & Johnson, 1993).

Future growth of interdisciplinary teaching and learning in school-based AFNR Education relies on an understanding of the status of AFNR and core content area connections. Therefore, the current national study explores the scope of collaboration between AFNR, leadership, mathematics, and science educators and the relationship between collaboration and intentions to teach leadership, mathematics, and science in AFNR Education curriculum.

LITERATURE REVIEW

Research suggests school-based AFNR Educators have responded to the calls for interdisciplinary connections with core content areas. Data indicate teachers have increased the amount of science, mathematics, and leadership, among other core content areas, within their curriculum (Haynes, Robinson, Edwards, & Key, 2012; Morgan et al., 2013; Myers & Thompson, 2009; Pauley, McKim, Curry Jr., McKendree, & Sorensen, 2019; Wang & Knobloch, 2018). Currently, research indicates AFNR educators report intentions to teach mathematics in nearly 25% of curriculum (McKim, Velez, Everett, & Sorensen, 2017), leadership in nearly 29% of curriculum (McKim, Pauley, Velez, & Sorensen, 2017), and science in nearly 40% of curriculum (McKim, Pauley, Velez, & Sorensen, 2018). Findings suggest AFNR educators are making connections between school-based AFNR Education and core content areas; however, there exists potential to increase the amount, and rigor, of interdisciplinary teaching and learning within the discipline.

One method for increasing the interdisciplinary teaching and learning within AFNR Education has been leveraging curriculum designed to foster an interdisciplinary learning environment. For example, Pauley et al. (2019) found AFNR Educators teaching specific *Curriculum for*

Agricultural Science Education (CASE) courses (i.e., curriculum designed to increase science content coverage in AFNR Education) reported higher science teaching intentions than their peers who did not teach the CASE curriculum. While resources such as the pre-developed CASE curriculum have been found to increase interdisciplinary connections between AFNR and core content areas, the interdisciplinary learning environment is limited to the expertise of the individual AFNR educator. Once the educator has completed professional development associated with the curriculum, he or she must rely on the curriculum and his or her own understanding of the core science content and skills to facilitate the connections between AFNR and science, potentially resulting in limitations to interdisciplinary teaching and learning.

Alternatively, collaboration between AFNR and core content area educators is a strongly cited recommendation which can provide opportunities for combined expertise throughout the school year and can create a more robust environment for interdisciplinary teaching and learning (Morgan, Parr, & Fuhrman, 2011; Myers & Thompson, 2009; Osborne & Dyer, 1998; Stephenson, Warnick, & Tarpley, 2008; Warnick & Thompson, 2007). Previous studies focused on collaboration between AFNR and science teachers indicate growth in collaboration over the years from less than nine percent of science teachers reporting collaborative activity with AFNR teachers (Osborne & Dyer, 1998) to 29% of science teachers and 39% of AFNR teachers reporting collaborative efforts (Warnick & Thompson, 2007). However, a more recent empirical investigation of the extent of collaboration between AFNR and core content area educators was not found in the literature.

In addition to scant current research exploring the scale of interdisciplinary collaborations, the relationship between interdisciplinary educator collaboration and outcomes associated with interdisciplinary teaching in school-based AFNR Education has been largely unexplored. One study was identified which determined the likelihood of mathematics and career and technical education (CTE) educators to illuminate connections between mathematics and CTE through the *Math-in-CTE Model* (Morgan et al., 2011). The study found teachers valued the collaborative opportunities and interdisciplinary connections the model promoted and were "likely, but not highly likely, to incorporate the model into their teaching" (p. 82). The findings suggest the potential to increase interdisciplinary connections through collaboration; however, more research is needed to determine the relationships between collaboration and

interdisciplinary teaching and learning within the scope of AFNR Education.

THEORETICAL FRAMEWORK

If interdisciplinary teaching and learning is the goal, opportunities to engage with others, contribute to an interdisciplinary community, and refine interdisciplinary practices must be created (Wenger, 2009). Collaboration between AFNR and core content area educators provides opportunities to create a community of practice focused on interdisciplinary teaching and learning. However, not all collaborative efforts share equal success. The theory of collaborative advantage describes the balancing act required by collaborative efforts, which can result in "collaborative advantage" or "collaborative inertia" (Vangen & Huxham, 2005; 2014). Collaborative advantage is the positive, forward energy created by collective action among members, the ideal achievement of collaboration; whereas, collaborative inertia is the idle lack of energy created by conflict and exasperated by ineffective management (Vangen & Huxham, 2005; 2014).

To promote collaborative advantage among collaborations in practice, Vangen and Huxham (2005; 2014) described various factors which influence collaborative processes and outcomes. They group the factors into themes, such as efficiency, collaborative structures, accountability, and resources, among others. Each theme indicates a characteristic or phenomena which influences the collaborative practice toward collaborative inertia or collaborative advantage (Vangen & Huxham 2005; 2014). However, the themes do not act in isolation. Rather, they overlap to depict the integrated and complex nature of collaboration (Vangen & Huxham 2005; 2014). For example, the presence or lack of collaborative structures can support or detract from accountability among the parties involved. The segregated, yet overlapping, structure of the theory allows for exploration of specific themes (e.g., accountability or resources) in research or practical contexts, while illuminating the dynamics and complexities of collaborations (Hibbert, Huxham, & Smith Ring, 2008).

The theory of collaborative advantage is operationalized in the current study by examining three quantifiable characteristics of collaborative interactions, related to efficiency (i.e., frequency of interdisciplinary interactions, duration of interdisciplinary interactions, and duration per instance of interdisciplinary interaction). However, as interdisciplinary collaboration is promoted in AFNR Education, it is imperative success must not be measured solely by the number of

collaborations; rather, by the ability to foster collaborative advantage, operationalized as emergent communities of practice enhancing interdisciplinary teaching and learning through intentions to teach leadership, mathematics, and science in school-based AFNR Education. While the theory is designed to allow for exploration of specific themes (Hibbert et al., 2008), the authors note, a focus on the exploration of efficiency characteristics results in an incomplete view of collaborations as described by the theory, thus indicating a limitation of the current study. However, the study serves as a first step in exploring interdisciplinary outcomes associated with collaborations in AFNR Education.

PURPOSE AND OBJECTIVES

The purpose of the current study was to understand the characteristics of interaction between AFNR and leadership, mathematics, and science educators on a national scale, as well as the relationship between interaction and the intentions of AFNR educators to teach leadership, mathematics, and science in school-based AFNR Education. This study was guided by the following objectives.

1. Describe characteristics of interaction between AFNR and leadership, mathematics, and science educators.
2. Analyze the relationship between characteristics of interaction and intentions to teach leadership, mathematics, and science in school-based AFNR Education.

RESEARCH METHOD

Data utilized for this study were derived from a larger research project in which survey methodology was used to collect quantitative data.

Population, Sample, and Data Collection

The target population included all school-based AFNR educators in the United States during the 2015-2016 school year. A simple random sample of 950 school-based AFNR educators from the National FFA Organization frame was obtained. Due to frame error (i.e., incorrect email addresses), potential respondents were limited to 828. Dillman's (2007) tailored design method was used to collect data in November and December of 2015. Usable data were provided by 212 respondents (n = 212; response rate = 25.60%). Using methods described by Linder, Murphy, and Briers (2001), non-response bias was determined not to have occurred, as a

comparison of on-time respondents (i.e., those responding within the first three points of contact; n = 168) and late respondents (i.e., those responding within the last two points of contact; n = 44) resulted in no statistically significant differences.

Instrumentation

Three variables of interest for each core content area (i.e., leadership, mathematics, and science) were utilized from the larger dataset. The first two variables quantified interaction between AFNR and leadership, mathematics, and science educators. For the first measure, frequency of interaction, respondents were asked to indicate the "average *instances per week* [spent] talking with leadership, mathematics, or science teachers (i.e. middle school, high school, or post-secondary) about their discipline's content." Similarly, for the second measure, duration of interaction, respondents were asked to report "average *hours per week* [spent] talking with leadership, mathematics, or science teachers (i.e. middle school, high school, or post-secondary) about their discipline's content." Each variable was reported separately for interaction between AFNR and leadership, AFNR and mathematics, and AFNR and science educators.

The third variable of interest was intentions to teach leadership, mathematics, and science in school-based AFNR Education. Sought in this group of variables were intentions to teach leadership, mathematics, and science in courses AFNR educators had taught, were currently teaching, or planned to teach, indicating familiarity of the educator with the curriculum. For familiar courses, respondents reported the percentage of curriculum in which leadership, mathematics, and science content/practices were intended. Responses were summated across courses to determine average intentions to teach leadership, mathematics, and science across school-based AFNR Education curriculum.

It is important to note respondents were asked to self-report all "interaction" and "intention" variables. The authors recognize the limitations associated with self-reported data; however, resources (i.e., cost) prohibited other methods of data collection.

Face and content validity were evaluated by a panel of experts, which included four faculty in school-based AFNR Education. Reliability was established via a pilot test among 31 preservice teachers at Utah State University and Oregon State University. Each construct of interest, intentions to teach leadership (Chronbach's Alpha = .96), mathematics (Chronbach's Alpha = .93), and science (Chronbach's Alpha = .96), exceeded the threshold for reliability (Fraenkel & Wallen, 2000).

Data Analysis

The first research objective, describing the characteristics of interaction between AFNR and core content area educators, was analyzed using descriptive statistics. Two respondent variables (i.e., frequency per week and duration per week) were utilized. A third variable, duration per instance, was calculated by dividing average duration per week by average frequency per week. Objective two was accomplished by analyzing correlations between the three characteristics of interaction and intentions to teach leadership, mathematics, and science in school-based AFNR Education. Effects sizes for correlations were established at .10 = small, .30 = medium, and .50 = large (Cohen, 1988).

RESULTS

Research objective one sought to describe the characteristics of interaction between AFNR and leadership, mathematics, and science educators (see Table 1). On average, AFNR educators reported interacting with science educators between three and four times per week (M = 3.42, SD = 5.52) resulting in nearly three hours of weekly interaction (M = 2.90, SD = 5.43); whereas interaction with leadership educators occurred about three times per week (M = 2.97, SD = 5.53) and approximately two hours and eight minutes per week (M = 2.14, SD = 4.29). Interaction between AFNR and mathematics educators occurred about twice per week (M = 2.12, SD = 4.98) for a total of about an hour and 20 minutes per week (M = 1.36, SD = 3.55). While the weekly frequency and duration varied, average time per interaction was similar across discipline areas, at about an hour per interaction (i.e., leadership M = 1.04, SD = 3.48; mathematics M = 1.05, SD = 3.76; and science M = 1.10, SD = 3.26).

Overall, interaction between AFNR and core content area educators varies; though, over half of AFNR educators reported at least weekly collaboration with core content area educators (i.e., mathematics, = 60.00%, leadership = 69.70%, and science = 82.50%). Conversely, 17.50% of AFNR educators reported no interaction with science educators, 30.30% reported no interaction with leadership educators, and 39.00% reported no interaction with mathematics educators, which suggests an opportunity to initiate new interdisciplinary communities of practice.

Research objective two sought to analyze the relationship between characteristics of interaction and intentions to teach leadership, mathematics, and science in school-based AFNR Education. Regarding interaction between AFNR and leadership educators, there existed a trivial

(Cohen, 1988) correlation between both frequency (r = -.04, p = .587) and duration (r = -.04, p = .623) of interaction and leadership teaching intentions, as well as a small (Cohen, 1988) negative correlation between duration per interaction and leadership teaching intentions (r = -.14, p = .118; see Table 2). However, no statistical significance was found among the correlations.

Table 1: AFNR Educator Interaction with Leadership, Mathematics, and Science Educators

	F	*M*	*SD*	Min.	Max.
Leadership					
Instances per Week	185	2.97	5.53	0	45
Duration per Week	182	2.14	4.29	0	40
Duration per Instance	130	1.04	3.48	0	40
Mathematics					
Instances per Week	177	2.12	4.98	0	50
Duration per Week	182	1.36	3.55	0	40
Duration per Instance	111	1.05	3.76	0	40
Science					
Instances per Week	177	3.42	5.52	0	50
Duration per Week	182	2.90	5.43	0	40
Duration per Instance	149	1.10	3.26	0	40

Note. *F* = Frequency, *M* = Mean, *SD* = Standard Deviation. Duration indicates "interaction time (hours)." Duration per instance indicates "average time (hours) per instance."

Table 2: Relationship between Interaction with Leadership Educators and Intentions to Teach Leadership

Characteristics of Interaction	Dependent Variable: Intentions to Teach Leadership	
	Pearson Correlation (*r*)	*p*-value
Instances per Week	-.04	.587
Duration per Week	-.04	.623
Duration per Instance	-.14	.118

Analysis of the relationship between interaction with mathematics educators and intentions to teach mathematics identified duration per instance had a statistically significant, small (Cohen, 1988), negative correlation with intentions to teach mathematics (r = -.21, p = .024; see Table 3). Additionally, while insignificant, interaction frequency had a small (Cohen, 1988), positive correlation (r = .15, p = .052) and duration had a trivial (Cohen, 1988), negative correlation (r = -.07, p = .319) with mathematics teaching intentions.

Table 3: Relationship between Interaction with Mathematics Educators and Intentions to Teach Mathematics

Characteristics of Interaction	Dependent Variable: Intentions to Teach Mathematics	
	Pearson Correlation (r)	p-value
Instances per Week	.15	.052
Duration per Week	-.07	.319
Duration per Instance	-.21	.024

Interaction between AFNR and science educators revealed a similar relationship (see Table 4). There existed a statistically significant, small (Cohen, 1988), negative correlation between duration per instance and intentions to teach science (r = -.24, p = .003). Though insignificant, trivial (Cohen, 1988) correlations were also identified between weekly frequency (r = .06, p = .417) and duration (r = -.06, p = .430) of interaction and intentions to teach science.

Table 4: Relationship between Interaction with Science Educators and Intentions to Teach Science

Characteristics of Interaction	Dependent Variable: Intentions to Teach Science	
	Pearson Correlation (r)	p-value
Instances per Week	.06	.417
Duration per Week	-.06	.430
Duration per Instance	-.24	.003

DISCUSSION AND CONCLUSIONS

The current study sought to understand the characteristics of interaction between AFNR and leadership, mathematics, and science educators as well as the relationship between interaction and the intentions of AFNR educators to teach leadership, mathematics, and science within school-based AFNR Education. Results suggest AFNR and core content area educators do collaborate, with at least 60 percent of AFNR educators reporting interactions with core content area educators at least once per week. The finding suggests continuous increases in collaboration from the late-1990s (Osborne & Dyer, 1998) and mid-2000s (Warnick & Thompson, 2007). However, the focus of collaborations should not be measured solely by amount of interaction, rather by outcomes.

Findings from research objective two suggest the amount of interaction during collaborative activities is related to interdisciplinary teaching intentions. However, what appears to matter is not the number of times educators interact per week or the length of time they engage per week, but the duration of each interaction. Regarding interactions between AFNR educators and science and mathematics educators, a statistically significant, negative correlation exists between the duration of each instance of interaction between AFNR educators and science or mathematics educators and AFNR educators' intentions to teach science or mathematics in their curriculum, indicating a positive relationship between shorter collaborative meetings and higher interdisciplinary teaching intentions.

Established conclusions are supported by the theory of collaborative advantage as the interactions characterized in interdisciplinary collaborations contribute to, or detract from, interdisciplinary teaching intentions. The shorter interaction of AFNR and mathematics and science educators contribute to collaborative advantage, where the increased interdisciplinary teaching intentions occur (Vangen & Huxham, 2005; 2014). However, longer interaction appears to contribute to collaborative inertia, where barriers prevent attainment of interdisciplinary outcomes (Vangen & Huxham, 2005; 2014).

While the current study explored the scope of interdisciplinary interaction, a wholistic view of the relationship between collaboration and interdisciplinary teaching and learning is limited. The current study did not explore the content nor context of interdisciplinary interaction; therefore, it is unclear what exhibited factors, beyond duration, frequency, and duration per frequency, contribute to, or detract from, collaborative advantage.

Research exploring the content and context of such interactions may provide insight into the relationship between shorter interactions between AFNR educators and science or mathematics educators and AFNR educator intentions to teach science or mathematics. For example, longer interactions may occur during mandated department meetings where little time is devoted to discussing interdisciplinary connections; whereas, shorter interactions may occur in a brief after-school meeting to ask for support with the next day's lesson.

RECOMMENDATIONS

Increased collaboration between AFNR and core content area educators has been recommended to promote further interdisciplinary teaching and learning within school-based AFNR Education (Stephenson et al., 2008; Warnick & Thompson, 2007). Implementing this recommendation has the potential to initiate new communities of practice centered around interdisciplinary teaching and learning (Wenger, 2009); however, practitioners should be intentional about engaging in short conversations with core content area educators. Additionally, to support the development of communities of practice, teacher educators should provide guidance and opportunities to practice interdisciplinary interactions among pre-service teachers in AFNR, mathematics, science, and leadership, as well as other core content areas.

While shorter interdisciplinary interaction was found to be correlated with higher mathematics and science teaching intentions, the content of these interactions is unknown. A limitation identified in the current study is the absence of data describing the content and context of interdisciplinary collaborative interaction; therefore, a qualitative study exploring such interaction is recommended.

Further, the current study analyzed the relationships between collaborative interactions and interdisciplinary teaching intentions in school-based AFNR Education. Recognizing collaborations have potential to promote interdisciplinary connections among all individuals involved, future research should explore interdisciplinary teaching intentions of other core content area educators participating in interdisciplinary communities of practice.

The current study identified practical strategies and opportunities for future research and practice to continue the growth of interdisciplinary teaching and learning within school-based AFNR Education. With focused efforts, school-based AFNR Education and core content area practitioners,

teacher educators, and researchers can create interdisciplinary communities of practice to better the learning experience for all students.

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Maker's Mind: Interdisciplinarity, Epistemology, and Collaborative Pedagogy

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ABSTRACT

This article considers the epistemological consequences of interdisciplinary, collaborative pedagogy through the lens of a practitioner whose goal is to theorize and contextualize her practice. The author traces connections between interdisciplinary pedagogy and the idea of Making or makerspaces. Giving in-depth examples of interdisciplinary, integrative, project-based collaborative activities that have an affinity to the concept of Making, the author concludes by suggesting some important epistemological consequences of a "Maker Pedagogy."

Keywords: Interdisciplinary; Epistemology; Collaboration; Pedagogy; and Makerspace/Making

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My teaching partner, Lee Orlando, gestures toward a laughing 6th grade student.

"He's never even smiled in class before," she says quietly. Lee has been his teacher for over 6 months now. The student's life circumstances are challenging and there have been frequent school absences.

He continues smiling and laughing, interacting with other 6th graders and the college sophomores who sit interspersed at the table. They are brainstorming ideas for a new hero who has never before existed, creating the

hero's name, backstory, and motivations. The work is creative, playful, sometimes silly.

"This is amazing," Lee says. I think we both feel humbled by the breakthroughs, small and large, that have happened in this unique collegiate/middle school partnership (described in detail below).

I have not always practiced a highly collaborative, inventive style of pedagogy. For years, I suspect that my teaching was a bit plodding and regimented. During my first year as an Assistant Professor, I wrote lectures that I hoped were polished gems, and practiced each three times before delivering it. (Embarrassingly, this is no exaggeration.) I loosened up considerably in Year Two and even more in later years. But—to use a sports metaphor—for much of my teaching career I focused on competent execution of the fundamentals, occasionally supplemented by creative play-making. I took the rules as given. I didn't question the refs.

My teaching game has since changed considerably. Because I now teach in an inquiry-based, consciously interdisciplinary, general education curriculum, I don't tie ideas from multiple fields together and call it a day. I literally have to think differently. I also teach differently, collaborate often, build pedagogical partnerships on and off campus, and tap into the generative power of multi-age learning collaborations. I'm becoming a Maker. What does this mean for my students, my colleagues, my institution, and my professional/personal self? What might it mean for higher education as a whole?

In this article, I refer to "Maker Pedagogy" as teaching activities that are interdisciplinary, immersive, integrative, multi-age, project-based, and collaborative. Maker Pedagogy entails that students are active, moving and Making, not memorizing. The key component of Making, as I will describe below, is that it is done in concert with others. Maker pedagogy is collaborative, born of ideas brainstormed in concert with fellow teachers, scholars, students, and other partners. The creativity is reflexive; the process iterative. Ideas are tried and assessed on the ground, improved, sometimes discarded, with a view toward student immersiveness and involvement.

Before we dig into the theory of Maker Pedagogy and trace its relationship to interdisciplinarity, let's look more closely at a specific example from my teaching practice.

Maker Pedagogy Example 1: Othello Graphic Novel Project

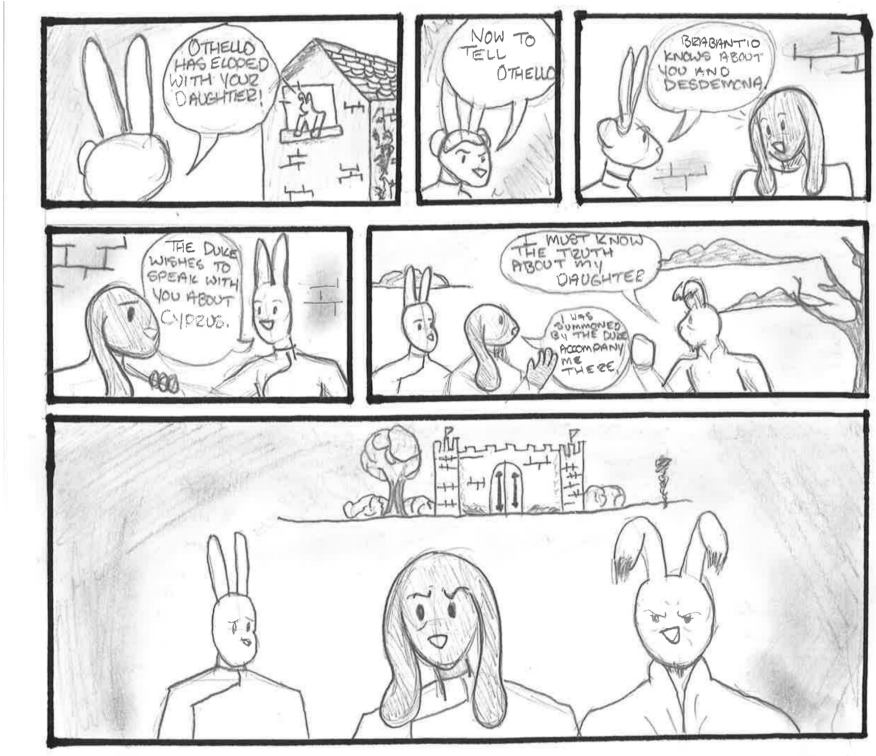
COR 120/125 Concepts of Community/Rhetoric of Community tasks 40 students, in groups of 5-7, to retell the story of Othello in graphic novel form. Students must choose how to tell the story, organize their work, create the art, find appropriate quotes from the text, and execute their vision while making

ongoing group decisions and resolving intergroup conflict. They have 5 hours to complete the project over the course of two back-to-back sessions.

Example 1 Context

The cohort system in our general education program allows first year students to get to know, and work closely alongside, 40 fellow students across two linked courses (COR 110: Concepts of Self and COR 115: Rhetoric of Self). Erik Shonstrom is my partner in designing integrative, inquiry- and-project-based collaborative learning activities for COR 110/115, and we take this task very seriously. We get students moving, interacting, and strategizing early on as we ask them to create and prototype new ideas. We also work in an iterative way, tweaking our pedagogy based on what has and has not worked in the past.

Figure 1: *Othello* With Bunnies



From the beginning of our partnership, Shonstrom and I have worked to teach COR 110/115 simultaneously and back-to-back on the same days. This allows us to teach our classes separately, or—as we do now every single day—join both sections together for a large, nearly 3-hour long block of time. This flexibility enables us to watch films together, go on field trips together, and

do creative projects like the Othello Graphic Novel together (see example below). Each semester, we design new, immersive, sometimes spontaneous activities for the classes. Cohorting this way is logistically challenging since it must be worked out with the Registrar both in terms of days/times that the courses are taught, and also in terms of booking appropriate classrooms. Despite the challenges, however, Shonstrom and I both believe that when done correctly, cohorting increases student engagement and retention by creating a true learning community where students feel they belong; where students engage in unusual, fun learning activities, both in and outside the classroom; and where we together create the conditions for successful collaboration and experimentation.

THE POWER OF "MAKING"

After sixteen years teaching in a traditional liberal arts college and seven years in an interdisciplinary general education curriculum, I have come to understand the key connection between interdisciplinary pedagogy and the idea of **Making**. The *Othello* graphic novel project described above illustrates the kind of "intellectual flexibility and playfulness" that characterizes interdisciplinary endeavors (Welch 2011, p. 34). Multiple skills and perspectives are brought to the learning process; many minds and interlocutors are required. Something is learned in the process of making something else.

Bullock (2014) describes Maker Pedagogy as

*an approach that utilizes the principles of ethical **hacking** (i.e., deconstructing existing technology for the purpose of creating knowledge), **adapting** (i.e., the freedom to use a technology for new purposes), **designing** (i.e., selecting components and ideas to solve problems), and **creating** (i.e., archiving contextual knowledge obtained through engaging in the process of making, as well as the actual tangible products).*

Following Bullock, McGregor (2018) refers to Maker Pedagogy as "understanding how things are made by taking them apart, and then using that understanding to put things together in different ways."

Maker labs and spaces are blossoming on college campuses. In 2014, 153 higher education institutions signed a letter to President Barack Obama, committing "to supporting Making on their campuses in a diversity of ways" (Byrne and Davidson 2015, p. 6).

Almost all [of these institutions] saw Making as synonymous with creativity, inventive, spontaneous, open, communal, collaborative and passionate exploration of personal ideas. In particular, "a spirit of creativity and

spontaneity" were seen as key qualities of the Maker Movement, which yields a "collaborative culture" ... "defined by intellectual curiosity" (Byrne and Davidson 2015, p. 10).

What is a Makerspace?

According to John Spencer, a Makerspace is "designed and dedicated to hands-on creativity" where students are "actually making something" (Gonzalez 2018). "Makerspaces are informal sites for creative production in art, science, and engineering where people of all ages blend digital and physical technologies to explore ideas, learn technical skills, and create new products" (Sheridan et al. 2014, p. 505). These spaces teach students "to engage in iterative thinking, creative thinking, critical thinking," as well as how to pivot, change, revise, persevere, and solve complex problems (Gonzalez 2018). Making is also inherently interdisciplinary:

"The potential being seen at campuses across the country is the opening of the physical and mental boundaries of higher education, opening up disciplines to one another, relationships across organizations, and new ways of getting to know one another in a productive, outcome-focused enterprise" (Byrne and Davidson 2015, p. 10).

The deeply collaborative experience of Making also helps dismantle traditional academic silos:

Making "erases disciplinary boundaries" ... or transcends them. At its core it fosters cross-campus experiences for students, faculty and staff and supports engaged "interdisciplinary collaboration between diverse fields, such as art, architecture, product design, science, journalism, business, and law" (Byrne and Davidson 2015, p. 11).

Sheridan and colleagues discovered something similar in their survey of three diverse Makerspaces:

[D]isciplinary boundaries are inauthentic to makerspace practice ... Makerspaces seem to break down disciplinary boundaries in ways that facilitate process- and product-oriented practices, leading to innovative work with a range of tools, materials, and processes (Sheridan et al. 2014, p. 527).

In the *Othello* Graphic Novel project, students complete the assignment with tools from literature, art, history, pop culture, graphic design, and project management, among others. They are learning new ways of seeing *Othello*, transcending divisional boundaries in making a product of which they tend to be quite proud. As Roffey says: "The maker movement is about teaching and learning that is focused on student centered inquiry. This is not

the project done at the end of a unit of learning, but the actual vehicle and purpose of the learning" (Roffey).

Interdisciplinary Making and Epistemology

Making can feel revelatory for students, who learn in the academy that there have always been gatekeepers determining what counts as knowledge. Stanley and Wise note that "a given epistemological framework specifies not only what 'knowledge' is and how to recognize it, but who are 'knowers' and by what means someone becomes one" (2002, p. 188). Knowledge construction is thus connected to social acceptance and power, as thinkers such as Michel Foucault, Thomas Kuhn, and Susan Bordo have argued.

The Maker is in a unique epistemic position, however. The practice of integrating insights from different disciplines "endeavors to position [interdisciplinarity] as an effective strategy for comprehending, navigating, and transforming knowledge." (Welch 2011, p. 2). It is a "real synthesis" of knowledge and methodological approaches (Jensenius 2012). Wright characterizes this process as a rhizomatic, nonlinear, and deliberately messy approach whose goal recognizes "how different disciplines and fields of study work alongside and against each other towards the shared goal of 'meaning-making.'" (2017). Rather than seeking one objective truth or meaning, interdisciplinarians work to create insight into the question at hand from multiple perspectives. Through inquiry, there is an active process of Making and re-making knowledge rather than a process of 'discovery.'

Hence the process itself, and the environments in which it occurs, holds the promise of being more democratic and less hierarchical in terms of who can demonstrate knowledge. Interdisciplinary makerspaces— including classrooms—are immersive, playful, and iterative. As Welch says, "Interdisciplinarity engages in epistemological pluralism, the holistic amalgamation of insights from diverse perspectives" (2012, p. 34). Philosopher John Dewey understood the necessary connection between pluralistic inquiry and democratic practice, noting that "all modes of human association," including schools, must exemplify the idea of democracy (1927, p. 143).

...the future of democracy is allied with spread of the scientific attitude. It is the sole guarantee against wholesale misleading by propaganda. More important still, it is the only assurance of the possibility of a public opinion intelligent enough to meet present social problems" (Dewey 1939, p 148-149).

Ideally, knowledge creation in an interdisciplinary Maker context is democratic, with students and teachers learning from each other:

Being a maker in these spaces involves participating in a space with diverse

tools, materials, and processes; finding problems and projects to work on; iterating through designs; becoming a member of a community; taking on leadership and teaching roles as needed; and sharing creations and skills with a wider world (Sheridan et al. 2014, p. 529).

Indeed,

Making "transcends the traditional hierarchy of knowledge dissemination and cuts across faculty, staff, and student populations." In particular, it fosters engaged peer-to-peer learning (Byrne and Davidson 2015, p. 10).

The spirit of inquiry that infuses Making is analogous to the growth mindset approach chronicled by Carol Dweck. Whereas a "fixed mindset" believes that qualities like intelligence are finite, either-you-have-it-or-you-don't personal endowments, "growth mindset" maintains that qualities are cultivated through effort (Dweck 2008, p. 6-7).

When you enter a mindset, you enter a new world. In one world— the world of fixed traits — success is about proving you're smart or talented. Validating yourself. In the other — the world of changing qualities — it's about stretching yourself to learn something new. Developing yourself (Dweck 2008, p. 15).

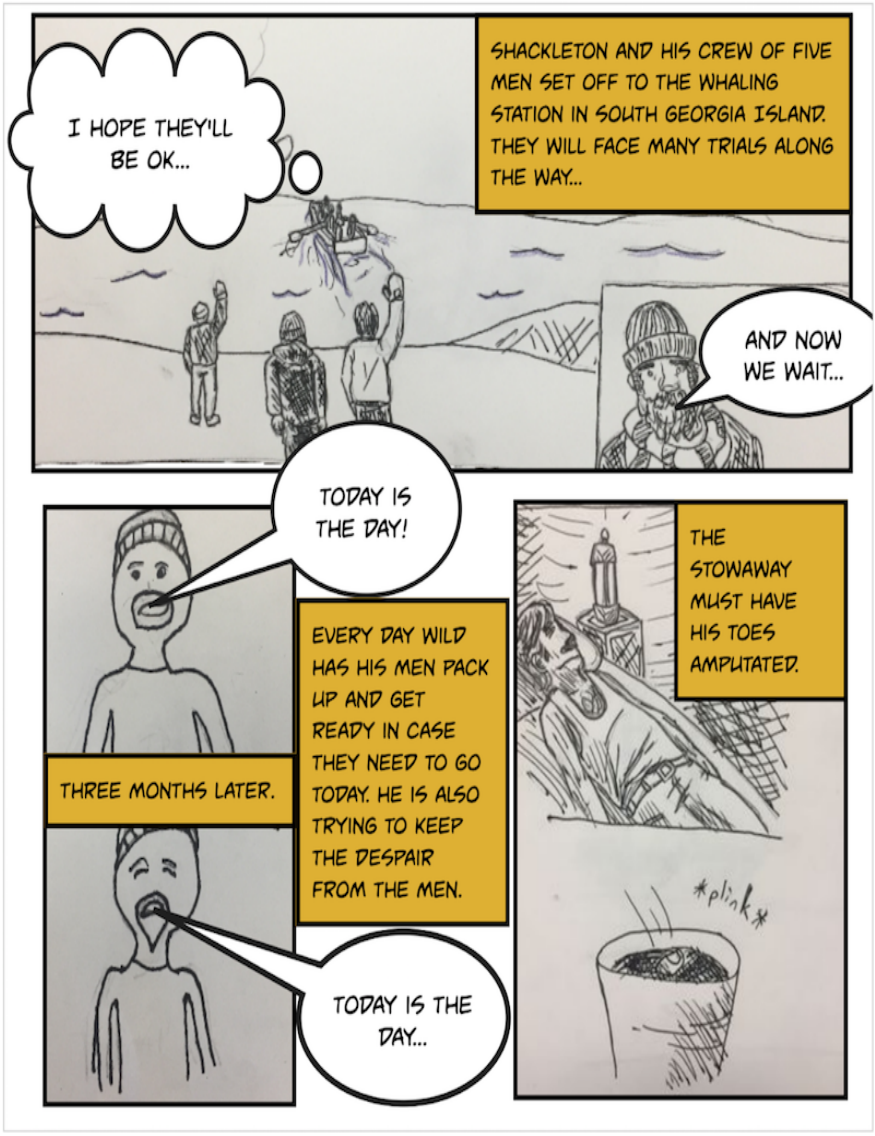
In Making, iteration and growth is an article of faith. Sheridan et al find that Makerspaces "value the process involved in making — in tinkering, in figuring things out, in playing with materials and tools," and find that learning "is deeply embedded in the experience of making" (2014, p. 528). In the same way, students who create the *Othello* Graphic Novel (above), or engage in the multi-age Hunt Middle School partnership (below) grow their knowledge by tinkering with ideas, playing with materials, bouncing techniques against each other, never knowing precisely what will work or how, until it does — or doesn't. The learning is indeed in the Making.

Maker Pedagogy Example 2: Multi-Age Partnerships

In COR 270, Heroines and Heroes: Tween Alliance, Champlain students are partnered with Hunt Middle School 6th graders. Students are typically matched 1:1, but sometimes two Champlain students end up partnering with one HMS student. In the fifth year of our collaboration, students are tasked with creating graphic novel panels that illustrate one moment in the hero's journey of Sir Ernest Shackleton and the crew of The Endurance. One noteworthy facet of this multi-age collaboration is that students of very different ages and abilities learn to speak the same theoretical language of Joseph Campbell's hero's journey. This partnership takes place over a five

week period and is the centerpiece of our semester's work. See two different videos of this partnership in action here and here. Below is one example of the Shackleton Graphic Novel project:

Figure 2: panels from Brett and Elliott's graphic novel, 2019



Example 2 Context

COR 270 Heroines and Heroes is designed to examine what heroic stories can tell us about who we are, have been, and aspire to be, particularly in the context of the West. The beginning segment of the course is anchored by an

attempt to understand and interrogate Joseph Campbell's concept of the "hero's journey" or "monomyth" in his influential book The Hero With A Thousand Faces.

The very existence of this immersive teaching partnership is predicated on collaborating across disciplines, ages, and levels of instruction. (Clearly, I am also borrowing the project from the successful Othello Graphic Novel Project in COR 110.) Having known Lee Orlando for years, I knew that she was a gifted, innovative K-12 educator. I suspected that the hero's journey was a conceptual lens that she and her students might find engaging. Moreover, I believed that a multi-age partnership would be mutually beneficial for our students. Lee readily agreed, and we dove into the necessary preparations. Our first student partnerships began in Spring 2015.

COR 270: Tween Alliance is unique because it models multi-age and on/off-campus collaboration for my students; it integrates Core Division work into the external Burlington community; it requires Champlain students to become mentors; it requires that Champlain students communicate effectively and work efficiently to produce a product that off-campus audiences will see; it facilitates a melding of the creative imaginations of 12 year olds and 20 year olds; and it enables 6th graders in the city of Burlington, many of whom have never before envisioned themselves as potential college students, to make meaningful contact with Champlain College.

Lee and I hope to leverage the enthusiasm produced by the graphic novel project and subsequent Do It Yourself (DIY) Hero project with the goal of seeing how the hero's world looks through the eyes of a different age demographic. It is a unique opportunity for video game designers, artists, graphic designers, elementary education majors, filmmakers, and professional writing students (among other majors) to practice empathy, gain insight, and remind themselves what "heroic" looks like through 12-year old eyes. It is not merely about learning specific content, although that certainly has value. Indeed, it is more about learning how to see through an older/younger person's eyes, thereby creating a more creative, inclusive, and empathetic worldview. This is a key component of the lifelong learning we want for our students.

My third example of Maker Pedagogy involves collaboration and Making not by students, but by faculty members on behalf of students.

Maker Pedagogy Example 3: Interactive Digital Text

Bodies: A Digital Companion *is an online, interactive course text created on the free, open-source Scalar publishing platform. For several years, COR 270: Bodies instructors at Champlain College switched back and forth amongst existing Bodies textbooks that did not precisely met the needs of our students. The idea for a new text was first envisioned as a printed reader that would encompass the major themes of the course as reflected in the various*

personalized iterations that are currently being taught. Instead, the digital text that resulted combines well-known academic writing about embodiment, new essays written by Bodies instructors, and relevant media artifacts.

Example 3: Context

I helped Dr. Katheryn Wright lead a collaborative group to realize this project successfully. The digital text goes far beyond the tweaking of course materials that professors are obliged to do each semester as part of normal teaching responsibilities. Indeed, it seeks to answer the intellectual and practical question "how best to construct a Body Studies text that is interdisciplinary, inquiry-based, created specifically for undergraduates at a professionally-focused college, and is published collaboratively?"

Our goal was to enlist fellow Bodies professors to develop a text that suits the specific needs of our students and the Core Division's inquiry-and-project-based pedagogy. Many existing texts in the area of Body Studies are written for advanced undergraduate and graduate students, and tend to be highly theoretical, often assuming significant prior knowledge of disciplines like gender studies, sociology, philosophy, and anthropology. We realized that our creative, professionally-focused students would benefit from a new, interdisciplinary, fully digital approach. The creative possibilities of this approach are only now emerging.

My work on this project included a great deal of learning and networking about possible digital platforms. I organized a Bodies Working Group in which COR 240 instructors met regularly to discuss our digital text, and along with Katheryn Wright, became part of Middlebury College's Digital Liberal Arts Initiative reading group. She and I also attended the week-long Digital Humanities Summer Institute at the University of Victoria, British Columbia in June 2017, and DH@Guelph in June 2018, in order to learn more about digital humanities and solicit advice about our digital text.

Collaboration is both a prerequisite and outcome of Bodies: A Digital Companion, requiring over half a dozen Core faculty to think and design together. Ultimately, the Bodies digital text collaboration models that innovative projects are interdisciplinary, student-focused, and designed in response to existing needs. The end product is one our campus uses and other campuses could emulate. Here is one page of the Digital Companion:

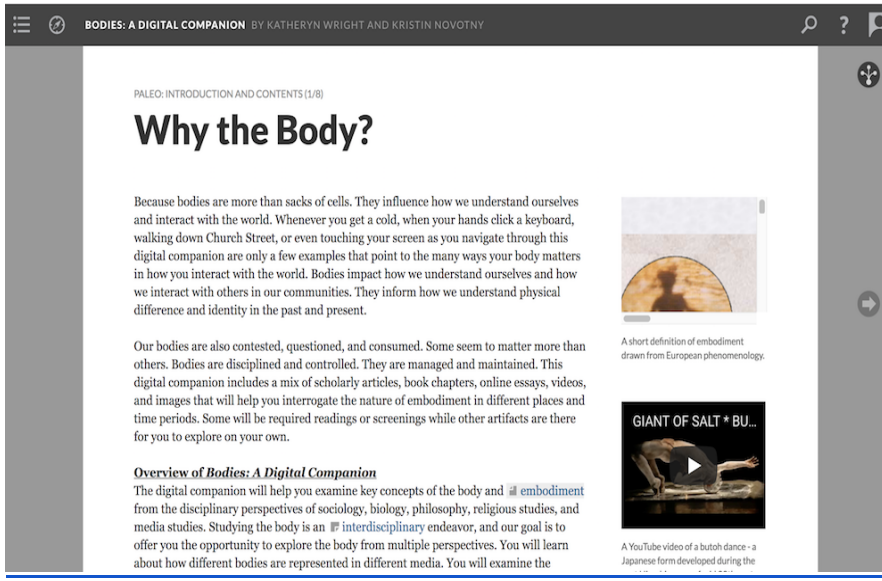


Figure 3: "Why the Body" page from *Bodies: A Digital Companion*

THREE EPISTEMOLOGICAL LESSONS FROM MAKER PEDAGOGY

Interdisciplinary Maker Pedagogy has multiple epistemological consequences, suggested here only in brief. First, because it embodies the very spirit of growth mindset, it has the ability to empower Makers (whether students or faculty members) and encourage self-knowledge. Second, it has the power to "unMake" long-standing, often problematic knowledge hierarchies and democratize learning in multi-age collaborative ways. Third, in more sobering vein, we must acknowledge the ways in which Making is mediated —and can be undermined —in higher education.

Making, Knowledge, and Self-Empowerment

The act of Making is self-fulfilling and iterative; it gives us the impetus to make more. "The No. 1 thing that the maker movement and makers continue to generate are new makers," [Paul] Gentile says. "Once people are around the maker movement they realize they've been missing something exciting. It goes to a very human need of creating" (DiGirolamo, 2019).

The more I collaborate with Makers, and the more I make myself, the more permission and joy I feel in experimenting. I cross disciplinary boundaries more often, engage in spontaneous play, dabble in new modalities that may or may not bear fruit. Although the benefits of this practice should be obvious to an educator like me, Making has been a hard-fought personal journey.

Until the end of high school, I saw myself as more of a Maker than

my adult life would suggest. I found joy in creating: acting, choral singing, writing poetry and prose. Ironically and sadly, for many years my adult academic life didn't reflect that creativity. I was a first generation college student with a textbook case of impostor syndrome, trying very hard to find my lane and stay in it. When I entered undergraduate and eventually graduate school, I swapped a growth mindset for a fixed one. Sensing that my academic endowments weren't enough in this new environment, I tried to adopt the posture of what academics were 'supposed' to be. Clearly, that contributed to the less-than-spontaneous way I taught for many years; it was as though my mentors were perched on my shoulder, and I didn't want to let them down.

Eventually, through successes and failures, I began to shuffle off fixed expectations of what being an academic meant for me. As I collaborated with educators of diverse academic background, I became not only more diverse and experimental in my teaching methods, but more open to my own possibilities as a thinker and Maker. I also began to see the need for modeling this mindset in the classroom. As Hannah McGregor (2018) stresses, to build student capacities for Making she herself needs "to be willing to bring my own fannish affect into the classroom, and model to them what it looks like to make something because I'm passionate about it."

"UnMaking" Knowledge Hierarchies

In 1993, Edward Said lectured on the qualities of "amateurism" in a way that, to this reader, presaged a Maker mindset:

"...amateurism [is] the desire to be moved not by profit or reward but by love for an unquenchable interest in the larger picture, in making connections across lines and barriers, in refusing to be tied down to a specialty, in caring for ideas and values despite the restrictions of a profession. (Said, 1993)

The interdisciplinary, immersive, collaborative projects in which classroom Makers engage strike me as avenues for democratizing the pursuit of knowledge in ways Said and Dewey would appreciate. Interdisciplinary thinking and Making has the potential to unmoor implicit boundaries in one's academic practice, as it has mine, between higher education and K-12, between theory and practice, between being an "expert" and having beginner's mind. It has the potential to broaden and complicate epistemological beliefs (how knowledge gets created, by whom, for whom). Now more than ever, I think of my college students and their 6th grade partners as knowledge makers. Via Maker Pedagogy, I am forced to confront spoken and unspoken hierarchies of knowledge creation that my career in academe has instilled.

Debbie Chachra would likely disagree with this take on Making. She writes in *The Atlantic* that

Making is not a rebel movement, scrappy individuals going up against the system. While the shift might be from the corporate to the individual ... it mostly re-inscribes familiar values, in slightly different form: that artifacts are important, and people are not ... Describing oneself as a maker—regardless of what one actually or mostly does—is a way of accruing to oneself the gendered, capitalist benefits of being a person who makes products (Chachra, 2015).

Chachra further locates her teaching work in opposition to Making: "To characterize what I do as "making" is to mistake the methods—courses, workshops, editorials—for the effects" (2015). Chachra's critique is pedagogically compelling: how should a teacher properly characterize her work to produce learning without commodifying it? If teaching work is not a product or saleable artifact, what is its nature?

I maintain, though, that what is to be celebrated about Maker Pedagogy is process, not product. It is inquiry. Flexibility. Curiosity. Openness to new angles of vision. Immersiveness. Playfulness. Exhilaration. Successes and failures. Movement. Growth. It is not the graphic novel that students have produced per se, but the process of dreaming it and producing it together. Giving more students opportunities to engage in Making is a part of recognizing their existing capacities, and opening the door to discovering others. It is also to recognize how certain groups of students have been systematically limited or excluded because more traditional education formats have marginalized them.

Maker Pedagogy thus invokes an interesting, possibly disruptive set of power dynamics. As noted above, the spaces where Making happens hold the promise that, within its walls, more democratic practices might obtain.

On one hand, a professor is empowered to design the parameters of the Maker classroom, and not everything is allowed. For instance, one difference between Making writ large and Maker Pedagogy is that "Unlike many schooling structures, the work in makerspaces is voluntary; people choose which learning arrangements suit their needs, what to work on, when to work on it, and whether and how they want to continue" (Sheridan et al 2014, p. 527). However, if students are to be graded on a project, they cannot just walk away from it entirely as they might if abandoning a project in a Makerspace. The teacher holds a particular kind of power in this context.

On the other hand, the practice of Maker Pedagogy means that students have power too. In the Hunt Middle School collaboration, for example, both the college sophomores and 6th graders have equal power to determine which section of Shackleton's journey to capture in their graphic novels, or which Do It Yourself Heroes to create. They are not identical to their college counterparts, but their voices matter.

In any classroom, students and teachers are not equally situated, and education is always already inflected by gender, race, class, and age. My sense

therefore is not that Making erases power differences completely, but instead allows new power and practices to emerge, thereby unsettling typical hierarchies.

Mediated Knowledge Making: Institutional Implications

"There is no getting around authority and power, and no getting around the intellectual's relationship to them." (Said, 1993)

Inevitably, the act of Making is mediated by structural realities, and knowledge production is woven together with institutional support/commitment or lack thereof. Interdisciplinary collaborative Making requires time, space, materials, money, and institutional will. Collaborations are often stymied by the very real institutional burdens that exist.

Here are some of the logistical realities that have affected my professional partnerships with Erik Shonstrom, Lee Orlando, and Katheryn Wright:

Funding needs to be obtained, often far in advance. **Permissions** may need to be granted. **Transportation** needs to be secured (e.g., buses hired). Overlapping **meeting times** must be found. Teaching and vacation **schedules** (college vs K-12) must be taken into account. **Rooms** need to be booked, including classrooms which are large and flexible enough so that Making can happen 'spontaneously.' Longer teaching **time blocks** must be requested. **Curricular space and instructor autonomy** must exist so that teachers have the bandwidth to experiment.

Creating the conditions for Maker Pedagogy is dependent on making a case to administrators, often many months in advance. That's a familiar scenario for most academics, but *is it antithetical to the spirit of Making*? What does it mean for curricular and pedagogical autonomy? I am very lucky that for the past 4 years I've had an institutional grant source that funds transportation to and from Hunt Middle School. Should innovative pedagogy have to depend on luck?

In sum, I am concerned that such institutional burdens work to thwart atypical creative collaboration and, particularly, spontaneous Making. This affects our pedagogy, curriculum, and — most importantly — our students, privileging the status quo in curricular and pedagogical terms.

CONCLUSION: MAKER'S MIND

In the introduction, I maintained that Maker Pedagogy causes me to think differently, teach differently, collaborate often, build pedagogical partnerships on and off campus, and tap into the generative power of multi-age learning collaborations. But what does this mean for my students?

The three examples above show that my students are engaging in interdisciplinary, immersive Making in multiple projects across multiple courses and age groups. Sometimes the learning process is chaotic. But to apply a phrase from James Scott in a very different context, Maker Pedagogy embraces the "tolerance for confusion and improvisation that accompanies social learning, and confidence in spontaneous cooperation and reciprocity" (Scott 2012, p. *xii*). Part of making it work entails believing that it will work.

Colleagues within, and increasingly outside, my academic division know that I'm up

for trying new styles of collaborative pedagogy. Indeed, my Making has been inspired by many of them. My closest collaborators (including Shonstrom, Wright, and Orlando) are themselves highly creative Makers. What might it mean to have more colleagues, and entire departments and divisions, reach out to each other through Making?

As a faculty member, I feel more like a Maker each day. My creativity feels less

bounded both in my professional and personal lives. I don't always take the rules as given. I see beyond the fears I had in my early years of teaching, when I wanted to do everything by the book, when I searched for belonging in academic spaces by proxy via other scholars' tested methods.

Higher education itself is shifting along with our students, and a burgeoning industry

is attempting to translate the needs of Generation Z to the college classroom. Selingo writes about a *Chronicle of Higher Education* report showing Gen Z students' desire for combined virtual and face-to-face learning. The "tips for developing an effective educational experience for Gen Z" are right out of the Maker Pedagogy playbook: let students tell their stories using their tools; create immersive environments; build flexible learning spaces (Selingo 2018).

Suggestions like these point to the potential of the digital humanities as a key

component of both Maker Pedagogy and liberal/general education. Katheryn Wright and I are currently collaborating on a project that attempts to rethink liberal/general education through the prism of the digital humanities. In doing so, we are beginning to explore how the concepts of interdisciplinarity, Makerspaces, and place-based learning sit at the intersection of digital humanities (DH) and liberal/general education. Digitally or otherwise, we agree that "learning is deeply embedded in the experience of making" (Sheridan 2014, p. 528).

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Interdisciplinary and Intergenerational Project, *Ulisses' Pirate*: An Empirical Study in the Context of Basic Education

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ABSTRACT

The aim of this study was to analyse the impact of an interdisciplinary and intergenerational educational experience in the elderly, in teachers, students and their parents or guardians. Creative Dance and Drama Workshops were articulated with Portuguese, PE, Arts and IT subjects. A total of 20 6th graders, their parents or guardians, five teachers and 15 elders participated

in the study. An analysis of 194 free evocations based in the free word association technique was performed, along with 17 semi-structured interviews. From the literary texts "Os Piratas" and "Ulisses", an expressions-based work was proposed, where drama and movement games were explored. Evocations of the central core were of Friendship, Learning, Affection, Solidarity and Interaction. Of the 264 text units analysed, interaction with the elders was highlighted. In the teachers' perception about the subjects and workshops involved in the project, a valorisation of IT and of Portuguese was registered. It is also relevant the amount of references to values and to the Interaction with the elders. This interdisciplinary and intergenerational project has revealed itself valuable for the integral and humanistic training of the students, having also given rise to corporeal artistic and emotional experiences relevant to their well-being.

Keywords: Interdisciplinarity; Intergenerationality; Basic Education.

INTRODUCTION

The integration and contextualization that today's school aims for should not only guide children's education, but also the educational intervention with other age groups. On the other hand, intergenerational work between children and the elderly may act as a facilitator of inclusive, integrated and creative social practices. Accordingly, the benefits of articulated intergenerational work are recognised in various domains, which the area of gerontology is an example (Carlson, Saczynski, & Rebok, 2008; Kaplan, Liu, & Hannon, 2010; Ouellet, Romero, & Sawchuk, 2016).

Recent concerns with ageing, despite their legitimacy, cannot justify prejudice associated to age nor be promotors of social cleavages between the young and the elderly, and the active and retired population. In this sense, initiatives that promote interaction between these populations might start an attitudinal change of the young towards the elderly (Bales, Eklund, & Siffin, 2010; Knapp & Stubblefield, 2010).

The aim of this study is to analyse the impact of an interdisciplinary and intergenerational educational experience in the elderly, teachers, students and their parents or legal guardians, raising awareness in the scientific and educational community about the benefits of intergenerational and integrated practices with the children and the elderly. Therefore, theoretical assumptions underlying this work are firstly presented. After, the educational experience "Ulisses' Pirate" is presented and analysed in detail.

INTERGENERATIONAL AND INTERDISCIPLINARY PROGRAMMES

An intergenerational programme is defined as a social vehicle that allows to different generations the opportunity of integration and involvement with matters related to society (Generations United, 2002). Operationally, it is expected that these programmes have some reciprocity of their cognitive, social and affective benefits. The number of studies about intergenerational studies in relevant scientific journals underlines the scientific robustness of this field of study (e.g., Bales, et al., 2010; Carlson, Erikson, & Kramer et al., 2009; Kaplan, Lin, & Hannon, 2010; Knapp & Stubblefield, 2010; Villas-Boas, Oliveira, Ramos, & Montero, 2015). In this sense, several social policies that promote the social integration of the elderly in the community have arisen. The promotion of spaces of intergenerational integration that have an educational and socializing role is deemed as a relevant strategy for a successful ageing process. The desirable biopsychosocial balance of the elder is achieved with the help of social policies, the family, friend networks and groups of interest, all together in the struggle against discrimination and prejudice that gravitates around old-age in the western culture (Ferreira, Maciel, Costa, Silva, & Moreira, 2012).

In the case of the elderly, the benefits that derive from these practices may be of social, functional or mental nature, something that has been recurrently indicated in the relevant literature (for a detailed explanation, "Experience Corps" - Gruenewald, Tanner, Fried, et al., 2016).

Regarding the benefits of this type of programmes, it is important to refer the positive impact that they have in school performance. For example, in schools where the elderly was a regular presence (volunteering for 15 weekly hours), children improved their results in reading (Rebok et al., 2004). Additionally, interaction with the elderly promotes the development of social competencies, such as communication, problem solving, positive attitudes towards the elders and communitarian sense of helpfulness (Corporation for National and Community Service, 2005).

Bales, Eklund and Siffin (2010) note that the young tend to improve their concept of elderly after having participated in intergenerational programmes. Volunteering with them, in a context of proximity, also allows the development of the young's' social and personal components.

Within the scope of interdisciplinary projects and having the integration of different areas of knowledge in education as reference, an excessive fragmentation of knowledge in separate areas is still present. The disciplinary "division", albeit necessary, has not provided the needed flexibility in order to promote the articulation and complementarity of

contents that belong to various school subjects. Russell and Zembylas (2007) present three arguments in favour of the role of artistic subjects in integration: 1) the promotion of stimulating intellectual and emotional learning experiences; 2) the development of forms of knowledge that link different areas; and 3) the improvement of learning and creativity. Accordingly, school interdisciplinarity is considered an efficient approach to the learning process, respecting not only what the students know but also their integration (Fazenda, 2015).

RESEARCH METHOD

Objectives

The project "Ulisses' Pirate" was based in the promotion and implementation of interdisciplinary and intergenerational practices and worked on the artistic, cultural, social and human components. It had the following objectives: 1) to know the opinions of students, parents, teachers and the elderly regarding the project; 2) to produce a positive effect in the elders' well-being; 3) to contribute to a more holistic and integrative training of the student.

Participants

A total of 20 sixth grade students (nine boys and 11 girls, 11.72±1.10 years), 20 parents or their legal guardians (42.63±4.54 years), five teachers (51.81±4.66 years) and 15 elders (10 women, five men; 81.42±9.99 years) participated in this study. The parents or legal guardians signed a free informed consent at the beginning of the school year, allowing their child to participate in the project.

"Ulisses' Pirate" Workshops

The integrated and intergenerational practices of the project were composed of Creative Dance and Drama workshops, taught by two external specialists that did not belong to the school staff and had not had prior contact with any participant. Drama Workshops were held during the whole school year (October 2015 to June 2016) and Creative Dance started in mid-February and ended in June 2016. Each session lasted 50 minutes.

These workshops articulated with other subjects: Portuguese, Physical Education, Music Education, Visual Arts, and Information Technologies. From the texts "Os Piratas" by Manuel António Pina and "Ulisses", by Maria Alberta Meneres, an expressions-based work was done, exploring drama and movement games, as well as the construction of puppets with both students and the elderly. This exercise, named "Ulisses' Pirate",

was presented at the end of the school year to the educational community and terminated the intergenerational and interdisciplinary programme, where both young and elders interacted in a context of integrated and expressive practices. The convergence of Dance, Drama, Music and Visual Arts allowed play, sharing and dreaming.

Instruments

Free evocation of words technique. Abric's Central core theory (Abric, 1998) was used to know the opinions of students, parents, teachers and the elderly regarding the project. The free evocation of words technique was used, with the following instruction: "write the first five words or phrases that come to your mind when you think of intergenerational practices" (induction term).

Semi-structured interviews. A total of 17 semi-structured interviews were made to four elders, four students, four parents or legal guardians, four teachers and one element of the school board. Two interview scripts (one for students, teachers, parents and legal guardians; the other for the elderly) were sent to four experts in the research field and changed accordingly. This process was then repeated with another panel of experts. The first script had questions including: 1) Tell us about the good things that happened in this project. Were there any bad aspects? Can you tell us which subjects were part of this project? 2) What do you think of the work that you did in Drama and Dance sessions? 3) What solidarity-oriented activities/projects did you do this year in school? In What ways this kind of activities may be important for the students?

For the elderly, the following script was used: 1) Tell us about the good aspects of this experience. Were there any bad aspects?; 2) In what ways did you change with this experience?; 3) Which activities did you enjoy the most and why?; 4) Which activities did you enjoy the least?; 5) How did you feel/which emotions did you experience before, during and after participating in the activities with the children?; and 6) How the children react when they were with you?

Formal and ethical procedures

Data gathering was done from June 12 to 15, and after the end of the project. The interviews were done within the school premises and in the retirement home, individually.

The intervention and investigation aimed to guarantee the respect of all ethical standards, assuming maximum confidentiality. The participants in the study were informed about the particularities of the present research. A formal authorization from the school's pedagogical council and from the

retirement home was also obtained. In order to obtain informed consent, a formal presentation letter was sent to the children's parents or legal guardians where they were informed about the objectives and implications of the study, having anonymity and confidentiality being assured. Each participant manifested their acceptance in participating in the study in a written consent.

Data analysis

Free recalls. The free recalls, obtained from an inductor term (intergenerational practices), were analysed using a specific software - EVOC v.2005 (Ensemble de Programmes Pemettant L´Analyse des Evocations) and SIMI (Similitude) (Vergès, 1993), developed from Vèrges techniques (1992, 1994). In EVOC (2005), the recalled words were listed and analysed by crossing its recall frequency with the average order of each recalled word, essentially to understand the central core intergenerational practices and the peripheries. Then, an index of position and one of frequency was calculated, to rank the importance of the word in the set of data collected. The crossing of these two criteria produced a four divisions matrix (Abric, 1994a, 1994b; Oliveira, Marques, Gomes, Teixeira, & Amaral, 2005), in which the terms were classified according to their significance levels. Therefore, the terms that correspond to the central core of representations are in the upper left quadrant. Lower left quadrant contains words considered as contrasting elements, words placed in the upper right quadrant constitute the first periphery. Lastly, the words in the lower right quadrant encompass the external and more flexible elements of the second periphery (Abric, 1994a, 1994b; Vergès, 1992).

Semi-structured interviews

To characterise the opinion of the participants, content analysis (Bardin, 2008) was made using QSR NVIVO software, v.9.0. This was done globally (for all interviews) and specifically (for each participant) by presenting the most referenced indicators in relation to the number of interviews [sources (S)] and the number of coded references [text units (TU)].

Validity was guaranteed by following the recommendations present in the literature for similar studies. Interviews were reviewed by experts, according to Litwin (1995). Before coding, the coders were subjected to a training process and methodological procedures were followed as recommended by Hill and Hill (2002). Intra and inter-coder reliability was tested through Cohen's Kappa (Fonseca, Silva, & Silva, 2007) with results considered as excellent [inter-coder reliability (97.52%) and intra-coder reliability (98.51%)].

RESULTS

Free evocation of words

A total of 194 free evocation of words were obtained from the term "intergenerational practices". The words were included in the database by the order in which they were recalled, having the order of evocation been matched with their frequency. This allowed a representation with four quadrants, separated by the mean order of evocation (OME) and recall frequency (f), highlighting the possible core and peripheral elements of the representation structure (Table 1).

Table 1: Free evocation of words obtained from the inductor term Intergenerational practices: Order of Evocation (OE), Mean Order of Evocation (OME) and frequencies (f).

Inductor Term: Intergenerational practices					
OE <=2.90 f >=10	*f*	*OME*	*OE >2.90 f >=10*	*f*	*OME*
Affection	14	2.64	Learn	13	3.62
Friendship	14	2.21	Respect	20	3.20
Learning	14	2.29	Satisfaction-Show	14	3.70
Interaction	13	2.62			
Fun	18	2.56			
Sharing	11	2.64			
Satisfaction-project	13	2.77			
OE <=2.90 5 ≤f <9	*f*	*OME*	*OE >2.90 5 ≤f <9*	*f*	*OME*
Caring	6	2.17	Affectivity	5	3.40
interesting	6	2.50	Happiness	7	3.71
Satisfaction-activities	6	2.60	Well-being	9	3.11
Solidarity	6	1.33	Intergenerational	5	4.60

Of the 194 recalls, 18 different words have emerged, with a mean order of evocation (OME) of 2.9. Regarding the inductor term "intergenerational practices", the central core is represented by the concepts of Affection, Friendship, Learning, Interaction, Fun, Sharing and Satisfaction-project. The first periphery (higher OE and f values) contains concepts that feed the central core such as Learn, Respect and Satisfaction with the show. The second periphery (lower OME and f values), the terms

Caring, Interesting, Satisfaction obtained with the activities and Solidarity are found. Lastly, the fourth quadrant (higher OME and lower f values) contains the terms Affectivity, Happiness, Well-being and Intergenerational.

Semi-structured interviews

To assess the impact of this educational and interdisciplinary experience, the coded TU are framed in a perspective of positivity or negativity according to its content. Table 2 presents the results according to type of participant.

Table 2: Text Units codified by participant

	Positivity		Negativity		
Intervenient	TU	%	TU	%	TU (Total)
Students	292	80,44%	71	19,56%	363
Teachers	378	85,91%	62	14,09%	440
Parents / legal guardians	404	92,24%	34	7,76%	438
Elderly	139	91,45%	13	8,53%	152
TOTAL	1213	87,08%	180	12,92%	1393

Results show that 87.08% of the total TU were associated with positivity, which reveals the positive impact this project had on them. According to each type of participant, it is possible to verify that parents or legal guardians (98.24%) and the elderly (91.45%) are the groups that indicated a higher number of positive aspects associated with the project. On the other hand, the students are the ones who highlighted a higher number of negative aspects (19.56%).

In students' opinion, interaction with the elderly (S=4; TU=26) and transmission of values (S=3: TU=12) were the main positive aspects of the experience. Teachers, in addition to transmission of values (S=5; TU=32) and interaction with the elderly (S=5: TU=17) referred the exercise "Ulysses' Pirate" presented to the community at the end of the school year as another main positive aspects of the project (S=5; TU=18). A similar opinion was expressed by the parents or legal guardians. To them, transmission of values (S=4; TU=63) and interaction with the elderly (S=4; TU=36) were the main positive aspects drawn from the experience. Lastly, the elderly highlighted

the positive aspects that resulted from the interaction with students (S=4; TU=24).

When results are analysed globally (n=17), participants referred as positive the interaction with the elderly (S=13; TU=79) and transmission of values (S=12; TU=107). Conversely, excess of teaching hours (S=7; TU=37), extra activities in addition to the curricular times (S=6; TU=46), tiredness (S=6; TU=20) and lack of non-organised time (S=4; TU=15) were the aspects deemed as negative.

Lastly, regarding the perception participants had about the subjects involved in the project, the following results were obtained: Art (S=4; TU=21), Portuguese (S=4; TU=16) and Music (S=4; TU=15) were the most referenced by students; Drama Workshop (S=2; TU=4) was the most referenced by parents or legal guardians; Art (S=4; TU=7) was the most evidenced by teachers. In the sum of interviews (S=13, as these questions were not asked to the elderly), Art (S=9; TU=31) and Portuguese (S=8; TU=23) were the subjects that, according to the participants' perception, had a greater participation in the experience.

DISCUSSION AND CONCLUSIONS

According to the main goals of the study and the results obtained, it is possible to conclude that this type of educational practice, with a strong social and artistic component (through the interdisciplinary and intergenerational approach), complements the curricular component of the school, connecting itself with the surrounding community. On the one hand, intergenerational and interdisciplinary practices meet the premise of lifelong education, based in the four pillars of knowledge of Education for the 21st century (Delors, Al-Mufti, Amagi et al., 1996): learn to know, do, be and live together. These pillars of knowledge were pictured when the concepts that emerged from the recalls regarding the project were analysed – Learning, Sharing, interaction, Fun, Affects and Friendship, as well as Satisfaction obtained with the activities of the project.

Additionally, regarding the positive impact that this project had on the wellbeing of the elderly, that these participants regard as positive the interaction they had with the students. The benefits in the elderly and in students that derive from these kinds of social and inclusive processes and in active methodological practices has been widely documented, and this study supports them.

We believe that the positive aspects of this experience, interaction with the elderly and transmission of values, in the students' opinion compensate some less positive references to the project (excess hours, extra activities in addition to the curricular times, tiredness and lack of non-organised time), favourably supporting the contribution or this project for a more holistic and integrational formation of the student. These two aspects are, in fact, highlighted both by

teachers and by the parents and legal guardians. The promotion of this type of formation meets the recommendations of UNESCO (2016), consubstantiated in the central idea of a holistic, ambitious and universal education, inspired in a vision that education transforms the life of people, communities and society. Social, Artistic and Cultural Education, in convergence with intergenerational practices, may materialize tin universal and integralist vision of today's school.

Educational practices should integrate and articulate the different knowledge areas that belong to the school curriculum and, on the other hand, make educational work more dynamic and active incentivising the collaborative and autonomous work of students. The exercise "Ulysses' Pirate", presented to the community in the end of the school year was another positive aspect of the project, as referred by the teachers. Globally, this project reflected an interdisciplinary work, developed by various subjects that compose the 6th grade curriculum.

In sum, this interdisciplinary and intergenerational project revealed as positive for the integral and humanistic formation of the student, through the corporeal, artistic and emotional experienced that allowed, having also developed well-being in the elderly, improving their support in terms of emotionality and conviviality.

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Participation in the Egyptian Pre-university Education Sector: International Organizations' Perspectives

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ABSTRACT

This paper discusses participation in the pre-university education sector by reviewing three stakeholders: Local communities, the Boards of Trustees (BOTs) and Non-Governmental Organizations (NGOs), their contributions to the sector, and their main challenges that prevent them from realizing more significant impacts from the perspectives of international organizations' officials. The paper adopts a qualitative method and builds on data gathered from semi-structured interviews with twelve international organizations' officials. The paper suggests that the lack of community participation has a lot of interactive factors within a very complex, complicated and demotivating context. It concludes with a set of recommendations that may be considered by the government of Egypt and the ministry of education for enhancing participation within the pre-university education sector.

Keywords*:* Boards of Trustees, Community Participation, Education Sector, International Organizations, NGOs.

INTRODUCTION

This paper discusses participation in the pre-university education sector by reviewing three main stakeholders: Local communities, the Boards of Trustees (BOTs) and Non-Governmental Organizations (NGOs), their contributions to the sector, and their key challenges that prevent them from realizing more significant impacts from the perspectives of international organizations' officials.

Participation includes a wide range of processes and refers to "Spontaneous cooperation between people, their agreement to work together and to contribute actively to the choice and implementation of development projects and programs that help achieve society's goals" (UNDP, 2003, Preamble, Para. P.4). Participation includes problem diagnosis and definition, information collection and analysis, priorities articulation and goal settings, resources assessment, programs deciding and planning, designing implementation strategies and apportioning responsibilities, programs management and progress monitoring (Shaeffer, 1994).

The World Bank (2002) states that:

> International research and experience suggest that active participation and shared decision-making is much more likely to foster genuine ownership of reform programs. It is also likely to increase the possibility that solutions to local problems can be found at the local level (p. 48).

Both top-down and bottom-up approaches are used by policy-makers with the aim of improving accountability. Empirical research suggests that the effectiveness of the top-down approach is limited. Therefore, the bottom-up participatory approach has received increasing attention. Decentralization and school management are adopted to utilize the information advantage that communities possess regarding their children's needs, harness their strong incentives to monitor the performance of teachers and principals, and make the best use of their comparative advantage in monitoring (Serra, D., Barr, A. & Packard, T. , 2011).

METHOD

This paper builds on qualitative data that were gathered mainly for my PhD thesis from semi-structured interviews that were conducted in English as

well as document analysis. All interviews were conducted in Cairo except one that was held in Upper Egypt.

Participants

Twelve international organizations' officials were interviewed, three from UN organizations and nine from international donor agencies; ten with an Egyptian background, one European and one Asian; seven women and five men. They had received educational credentials of high quality. All of them had at least a master's degree; 50% had completed their doctoral degrees at western universities; and four of them held the rank of a university professor.

For confidentiality, I transcribed the interviews myself. Names of the participants were changed in a systematic way without any reference to their real names, identifying information or their organizations of affiliation. After transcribing the interviews, transcripts were then sent back to participants to check for validity and verification. They were informed that it was completely up to them to add, delete, change or edit the transcript with the aim of improving and focusing their contributions. A final version of the transcripts was reached in the light of the received feedback.

RESULTS

Data gathered from different sources were categorized into the following main themes: Local Communities, the Boards of Trustees (BOTs) and Non-Governmental Organizations (NGOS). More sub-themes were identified later.

I- Local Communities

According to the United Nations Development Programme Evaluation Office (2004):

> International experience shows that the effectiveness of education can be enhanced through using community-driven changes appropriate to local opportunities for employment, productivity and life-skills - thus generating higher returns to education (pp. 4-5).

Similarly, the World Bank (2013) suggests that "communities tend to express greater satisfaction with decisions in which they participate, even when participation does not change the outcome or when outcomes are not consistent with their expressed preferences" (p. 10).

Thus, participation is important not only for increasing and mobilizing resources required for implementing educational reforms but also for its contribution to enhancing the level of satisfaction among communities and beneficiaries as it gives them the chance to take part in decision-making processes and get actively involved in governance and management of the education sector.

Recent trends in international projects in education show a participative approach by increasing the involvement of local stakeholders. International organizations and governments have to work harder to ensure greater cooperation at the local level as there are increasing expectation among communities and local governments they should be more involved in decision-making processes at all levels (International Institute for Educational Planning (IIEP), 1999). Thus, it can be argued that participation can enhance governance through empowering local communities and getting them more involved in decision-making. In other words, enhancing participation can impact governance positively.

Mba and Ongolo-Zogo (2010) state that:

> Good governance includes institutional reforms for a better visibility of public initiatives, a greater sense of accountability of the leaders and the mobilization of management competences. The supporters of deconcentrated and decentralized powers think that good governance is justified by the fact that the communities are in total control of the management of social services (p. 4).

The Egyptian Ministry of Education (2007) seeks to develop the responsibilities and roles of local communities to become more involved in supporting education improvement especially at the school level. It aims at mobilizing the local capacity and resources for improving planning, organization, accountability and monitoring processes.

Local communities have contributed to several pilots, initiatives, and achievements to support the education sector; such as the Alexandria experiment and community schools that have been recognized by international organizations as successful practices.

The Alexandria Experiment

The Alexandria Experiment was launched after signing a memorandum of agreement among the MOE, the Governorate of Alexandria, the USAID, and the Alexandria Development Center (NGO) for implementing a pilot program that aimed at enhancing participation,

implementing advanced decentralized management, delegating authorities and responsibilities to the school level, and providing teachers and administrators with advanced training programs. In support of this initiative, the MOE delegated unprecedented authorities to the Governor of Alexandria. The initiative enabled the mobilization of community resources with a high degree of disbursement-flexibility for providing incentives for employees, purchasing equipment and furniture, enhancing education process and implementing awareness campaigns (United Nations Development Programme (UNDP), 2004).

The success of that initiative in promoting decentralized decision-making and empowering local communities encouraged the MOE to implement similar initiatives in six other governorates, namely: Cairo, Fayoum, Beni Suef, Minia, Qena and Aswan (Hammad, 2012).

Unfortunately, the success of the Alexandria Experiment that was recognized by national and international stakeholders failed to be mainstreamed in other governorates and was not even sustained in Alexandria.

Community Schools

Community Schools represent a good example of effective community participation to the education sector in Egypt where local communities normally donate the land for building schools. Community schools aim at providing educational opportunities for the most deprived regions through utilizing a student-centered approach where teachers facilitate the educational process and adopt multi-level classes (Ministry of Education, 2002).

Since their inception in 1992, Community Schools supported by UNICEF have served disadvantaged areas and offered a second chance to dropouts and those not enrolled in primary education. They support learners and communities, provide suitable opportunities for girls, and demonstrate benefits for students and their families (Ministry of Education, 2014). In 2016/2017, the number of those schools reached 5000, accommodating 123,672 students; 89,439 girls and 34,233 boys (Ministry of Education, 2017).

Taking into consideration the whole context of community schools, they implement a number of facilitation and flexibility criteria. For example, they do not comply with the specifications defined for school-buildings; two facilitators from the local community work in those schools; learners do not pay expenses or commit to a school uniform; and the flexibility of hours to

allow learners to fulfill their personal and professional commitments and activities (NCERD, 2015).

Local communities are presented according to the following sub-themes: Weak Community Participation, An Environment for Success, and Community Participation Challenges.

Weak Community Participation

All participants agree that participation in the education sector is weak which negatively impacts its governance. Jack, for example, confirms the weak participation in the education sector though he is confident that donors will address this issue in their programs and projects. He states that:

> I do not think there is enough participation from society into problems that face the Ministry of Education. This is my personal point of view. But I am sure that donors are working on this and they can avail opportunities for the public to participate in the decision-making as well at least at the local level.

Adam presents a very similar opinion suggesting that although community participation in Egypt is low, even when compared to other developing and neighboring countries, there is a potential opportunity to increase its level in the education sector. This opportunity can be understood in the light of the expansion of the NGOs' sector. Adam explains:

> Participation is limited but growing. The bottom line we are talking about growing participation from civil society in education policy-making, but it is still limited relatively to other countries; even other developing and Arab counties. The number of organizations working on education is increasing.

Adam confirms the weakness of participation in Egypt and justifies it in the light of political and cultural aspects rather than economic ones. He suggests that the lack of participation can be better justified by the political and cultural environment:

> In Egypt, I think the lack of participation is a tendency and related to the political and cultural aspects rather than economic aspects. My understanding is based on what happened after 2011. After 2011, there was unexpected level of participation in elections, constitutions and so on. So, the lack of participation is not actually related to

> poverty because the revolution has not provided prosperity to Egypt up till now. The political and cultural environment of the revolution, surrounding what happened, I think gave people a motive to participate.

Sandy indicates that the lack of awareness of the public and local communities is a powerful factor that affects negatively the level of participation in the education sector suggesting that raising awareness of local communities regarding education, its importance and the change they can make in their schools will improve participation.

An Environment for Success

Adam implies there is no one single stakeholder or factor that makes the success of educational reforms. He explains the importance and elements of the supportive environment for enabling success. He gives the example of the "Alexandria Experiment", where the efforts of different stakeholders interacted and led to its success. Success factors in Alexandria included: political leadership from the governor of Alexandria and educational leadership at the governorate level; partnership and contributions of international organizations, represented by the USAID through Education Reform Program (ERP), and the private sector; and participation of local communities, the BOTs and NGOs. Adam explains:

> In Alexandria, we are talking about good political leadership, Abdel Salam Al-Mahgoub, was a very good governor and very popular at the same time. He had a very good relationship and a trust relationship with the private sector. The private sector put money in this and international organizations found the good raspy to go ahead and participate in this kind of initiatives. We talk about many success factors worked together at the same time. When you have leadership, motivated private sector, some ideas, packing from the international organizations, non-governmental organizations and civil society, you can talk about this. Lack of participation in Egypt is not embedded in the country. It depends on the circumstances. The experience of Alexandria is really a very good example of this. When you have the environment ready for this, people participate.

To clarify what he means by a successful environment, Adam uses the following metaphor: "When the success ingredients come together, you have a good dish".

His perspective is in accordance with other participants' views that suggest that people become more involved, motivated and enthusiastic to participate in education when they realize there are serious efforts from different stakeholders; especially those emerging from the education sector.

Community Participation Challenges

There are several challenges that face the effective participation in the education sector emerged from the participants' perspectives and are presented according the flowing sub-themes: Poverty; Lack of Participation Culture; Lack of Motivation; Lack of Trust; and Barriers and Negative Participation.

Poverty

Egypt is not a poor country according to international standards and is ranked as a middle-income country by the World Bank. However, poverty continues to be a serious challenge (UNESCO, 2008). The national poverty rate has risen from 16.7 percent to 26.3 percent in 1999/2000 and 2012/2013 respectively. There is a great discrepancy among different geographic regions. In Upper Rural Egypt, for example, over half of the population live under the poverty line (Ministry of International Cooperation, 2016).

Poverty may be a strong factor in reducing the level of participation, but it does not prevent it totally. Even in governorates with high poverty rates, participation exists in different forms.

It seems that most participants have an agreement regarding poverty's negative impact on the level of participation. Participation may take different forms that do not always include the financial contributions. For example, in different governorates, people contribute to schools' maintenance activities with their own efforts and time.

Peter, for example, is convinced that poverty negatively impacts the level of participation. He suggests that enhancing participation in general requires financial resources. In response to a question on whether he thinks that poverty contributes to the weak participation to the education sector, he states that:

> Yes, [poverty] contributes to the lack of participation. Setting up these dialogues, is time consuming and it is costly because you have to arrange places; you have to carry out outreach measures; you have to invite people; you have to inform people that this is taking place; and the information material has to be prepared. This is not something that anyone can do. The whole thing requires financial means.

This comes in accordance with the United Nations Development Programme Evaluation Office (2004) that suggests: “The very poor do not have a voice in official participation structures because they are too busy seeking out the means of survival” (p. 27).

Peter indicates that the poor are less likely to participate as they are more focused on addressing and fulfilling their own basic needs. Thus, participation is not a priority for the poor, as he suggests:

> I think the extent to which people are eager to participate or engage in this type of processes is dependent on their income, on their capabilities. So, if you are struggling with your basic needs, and someone asks you to join the Boards of Trustees, you will say: “Sorry, I have better things to do”; which is understandable.

Suzanne confirms that poverty has a negative impact on participation stating that: “Definitely; poverty is an issue. Surely the more poverty, the less support to education you will find”.

Adam, however, suggests that the results of studies that explored the relationship between poverty and participation come inconsistent and could not show one single trend:

> One of the main themes in development is the relationship between political development and economic development like the relationship between the level of participation and the standard of living and the poverty incidence and so on. Let’s say that the results of most empirical studies on this issue is mild. There is no trend saying that poverty will lead to lower participation because we have specific international experiences, in poor countries, but they have very active people in services like education, health and municipalities.

Adam’s opinion is in accordance with United Nations Development Programs (UNDP, 2003) that states: “Though the evidence is inconclusive, the low level of political participation would suggest that poverty is an obstacle to people having a proper voice in the decisions which affect their lives” (p. 49).

Nadia, also, indicates that poverty is not a barrier for the effective participation in the education sector, but the lack of awareness is. She refers to the importance of local communities’ awareness and commitment in enhancing participation in many positive ways.

It can be concluded that poverty is a barrier to participation in education, but it does not prevent it. Evidence from the ground demonstrates that even the poor contribute to the education sector in many ways. They can offer their time, efforts and skills to improve schools' environment, repair schools' furniture, conduct maintenance, and paint classrooms. However, they still need to be informed and given more chances and channels to participate.

Lack of Participation Culture

The lack of participation is justified by the lack of that culture as Ramzy suggests. He states that people tend to be more involved and engaged in education and educational services that are monitored and provided by the private sector, because they have to pay for those services. Consequently, they would like to make sure they pay in return for getting quality educational services.

Ramzy explains:

> Participation is very poor because people do not have the culture to participate. It is the problem of free education. If you compare the public education with the private education, you will see because parents pay a big amount of money to private schools, they go and are very serious. There is also a bad tradition in public schools. When parents come, the school starts asking them for donation for improving the school and things of that sort. So, parents are very reluctant to go. You need to create a new culture and you need new ways to get people involved. If you listen to media or talk to any person on education, any person, they will criticize education and say: "What is this kind of education?". But these kinds of opinions go nowhere because there is no channel to receive or discuss this.

Ramzy explains that parents are more reluctant to participate in any school activities or attend any school events. They tend to keep away from participating in school activities such as the meetings of the BOTs, formerly Parents-Teachers Councils (PTCs), as in those meetings they are normally requested to donate funds to schools.

Mark also indicates that the lack of participation culture is a factor in reducing participation impact on the education sector, its governance and management; even with the existence of governance structures such as school boards. He asks: "How a citizen can participate effectively in the

schooling system? You have Boards of Trustees but still the culture it is not there. So, I see the level of participation is not that good".

Lack of Motivation

Adam justifies the lack of participation in the education sector by the absence of a clear motivation. He suggests that people would be more engaged and involved if they witness that their contributions lead to real improvements and changes. He says:

> I think participation is related to motivation. If people realize that their participation leads to change, they will participate. If the political environment gives them a message that your participation is indifferent and will not lead to a real change, people will respond by not to participate rather than insisting on that position. This is a difference between Egypt and other countries. In some other countries when you say your participation will not lead to change, this leads to more participation and more insistence on change. But in Egypt when people feel their participation is not counted so they do not voice and avoid.

Sarah gives a very similar point of view, suggesting that people are more motivated and interested in contributing to education reforms and initiatives when they see serious efforts exerted by the education sector at all its levels. She states that community efforts to support the education sector can take different forms such as supporting schools' improvement plans, mobilizing resources, providing necessary equipment and materials and implementing school maintenance:

> When the community sees serious initiatives from the school or from the Ministry that they want to do something that is really good for their children and starts to see good quality services provided for their children, they really support. In community schools, for example, they donate locations to the Ministry. In inclusive schools, they bring shadow teachers for disable children. They provide materials and extra resources for children with disabilities. They are willing to do anything for their children. They demonstrated that very well in all that they pay and invest in private tutoring.

Lack of Trust

One of the most serious challenges facing the education sector is the lack of trust among its different stakeholders. It is a phenomenon that can be clearly seen in almost every single aspect of the sector. Lack of trust within the sector is associated and justified by the lack of transparency; the lack of information, data and statistics; and the lack of data sharing and flow among different stakeholders.

Sarah blames the MOE for its inability to gain the trust of different stakeholders including communities and parents. She suggests that the MOE has to raise their awareness of reform efforts and get them more involved in consultations and decision-making processes. She argues:

> If the government can really regain trust of the communities, people and parents, that it is really serious on doing something good for their children. The problems and weaknesses are all over the place. Everyone is talking about them. The good things are not as much, and no one talks about them even the Ministry. So, if they could publicize more on what they are trying to do, start involving parents and communities with them, start listening to them and having them as active partners, not just listening to them and then going and doing their own things, but really involving them and really strengthening good governance. When you give the community the responsibility of the school and ask them: "Please come and help us", I think this will make a lot of difference.

Barriers and Negative Participation

Peter suggests various barriers that lower the effective participation in the education sector, suggesting that those barriers are not necessarily related to the political environment. He indicates that people may have different reasons for not participating including their avoidance of taking more burdens; their feeling that they lack the required capabilities; their inability to contribute in a meaningful way; insecurity to express their points of view; low income and the lack of education. As Peter sees it:

> Participation is even hindered by things that have nothing to do with the political environment. If we are talking about city that is as huge as Cairo, and my commute is very long to the place or the school or wherever the Board of Trustees is going to meet, so this is going to hinder my participation. Sometimes people feel they will not be able to contribute anything meaningful. They may feel their capabilities

are not enough. They may feel insecure for expressing their views or articulating their ideas in such an open place. Sometimes if you have platforms that include people from different backgrounds, or that are meant to include people from different backgrounds, people from the lower income or have limited education might feel it is not their place. They will not be able to express their ideas in a proper way. They will say: “This is not for me. People will not take me seriously. People will laugh at me. This is not for me.

The UNDP (2003) describes the challenges facing participation in Egypt as follows:

> There are other psychological and cultural obstacles facing participation, including the suspicion of government and all its related agencies, the suspicion of other individuals, complex and ambiguous laws, individualism, lack of initiative, the weakness of collective work, passivity, and indifference. These and other cultural and psychological features that are in contradiction with the culture if participation, hamper both local and human development (p. 66).

Nancy identifies the lack of coordination as a challenging area that the MOE should work on to enhance participation and maximize its impacts on the education sector when she states:

> The participation of civil society in pre-university education sector is very important and promising. The efforts exerted by civil society and non-governmental organization are huge and cannot be ignored. The Ministry of Education can benefit from these efforts if it leads efforts towards better coordination.

Mary suggests that sometimes voices of communities, families and parents can have very negative impacts on education and its reforms. Those voices can be described as negative participation when they constitute strong resistance that undermines initiatives introduced by the MOE to reform the education sector and overcome its challenges. Mary states that:

> Participation has also disadvantages in the sense that secondary education system needs to be reformed. It is a very flood system. However, even when the Ministry gets some good ideas and initiatives to try and reform that system, it is the people, families,

parents, citizens who obstruct the process. So, overall there is a very strong and powerful voice for people in education, but sometimes that voice is good and sometimes it is not.

II- The Boards of Trustees

The BOTs have an important role to play in the education reform strategy in Egypt. The principal rationale behind their establishment was to intensify the role of communities in the education reform. They have been envisioned as the vehicle through which a wide range of stakeholders can participate in educational planning, development, monitoring and the evaluation of the educational process (Education Reform Program, 2008).

The importance of the consistent approach between school and home could be influential on students' performance and that is why it is important to have parents' involvement in school activities. However, in Egypt, there are no regular and frequent meetings or class observation days (JICA, 2016).

After being piloted in collaboration with the USAID in seven governorates, the BOTs have been implemented all over the country. In 2005, the ministerial decree, No. 258 was issued to mainstream the BOTs in all Egyptian schools for increasing the involvement of different stakeholders in supporting the education sector, contributing to its governance and management, participating in decision-making processes, and enhancing monitoring of school processes and activities (Ministry of Education, 2005). However, the BOTs still face significant challenges to realize their desired goals towards empowering schools and enhancing their decision-making authority.

According to the Ministerial Decree No. 289 of 2011, regarding the reorganization of the BOTs, the school BOT is composed of thirteen members: five elected members representing students' parents; four public figures chosen by the Governor or a delegated representative; three teachers from the school elected by their colleagues; and the principal. The school BOT is responsible for realizing decentralization in management, monitoring, evaluation and decision-making processes; encouraging local and voluntary efforts to enhance community participation in supporting education; improving the educational process and overcoming its challenges; and fostering cooperation between parents and teachers (Ministry of Education, 2011).

The BOTs are presented through the following sub-themes: A Golden Opportunity; Impact; and The BOTs' Challenges.

A Golden Opportunity

BOTs play a significant role in providing advisory support to school management through bringing the communities, families, and experts closer to schools and developing an environment of trust and support to those schools from their local communities (UNESCO, 2008).

Despite facing several challenges in their implementation that undermine their purpose and roles, the BOTs are considered a real opportunity to move towards a more decentralized education sector through giving a voice to communities and families in education governance and management.

Jack describes the BOTs as a golden opportunity that can enhance community participation in the Egyptian pre-university education sector when he says:

> The Boards of Trustees is a golden opportunity for participation from the communities and parents in the education process. It is not limited to the school level. Obviously, there are different levels of Boards of Trustees at the district level, the governorate level and the national level as well. I think this is the main avenue for citizen participation in the education system.

Mary stresses the importance of the BOTs in the Egyptian society and the education sector as they can contribute to improving the relationship between schools and families. Before the establishment of the BOTs, there were the Parents-Teachers Councils (PTCs) that were associated with the idea of inviting parents to schools mainly for collecting donations, which made parents reluctant to participate or even attend those meetings. Mary explains:

> Boards of Trustees are good. The relationship between school, parents and families improved. Previously, parents and community members were afraid to go to schools because the moment they stepped in they were asked for money. Now there is this body and they have tried to work with it. It is doing well. They help schools with ideas, they participate in decisions-making. They help in school-improvement plans. They help schools towards accreditation. What is most important is that community feels they have a say in the school belonging to them.

Mary concludes that an effective leadership at the school level, represented in school principal, is very crucial for the successful implementation and effective contribution of the BOTs stating: “In order to have a good BOT, you must have a good school leader”.

In general, school principals, however, lack the necessary knowledge, the required professional capacities and the positive attitudes that enable them to take the initiatives they should (Rizk, 2016).

Impact

Suggesting that the authorities of the BOTs in Egypt are very limited, Hammad (2012) refers to the BOTs as “pseudo participation” where the focus is on activities related to supervising of school activities and resources mobilization. However, issues like policy design, curriculum development, staff hiring and firing, and textbooks design stay untouched to a great extent.

Many participants indicate that the BOTs have achieved several positive impacts within the education sector though there is still a huge room for improvement. Ramzy, for example, confirms the existence of good practices in some governorates in Upper Egypt and stresses the importance of identifying and spreading good practices and the remarkable achievements of the BOTs at their different levels. Those practices can represent guidance a model to follow. According to Ramzy:

> I noticed some good practices in Qena, Luxor and Fayoum. However, the main challenge is how to get the best output of such a board. That is one thing. The other thing is to take their suggestions seriously and to authorize and delegate them. Give them responsibilities they can use to improve schools. If, for example, you have a good school, good district, or good governorate, you have to make these practices shine. You can say the Board of Trustees in this school has done this and this and because they did that the school improved and students are happy to go to this school. Look at that district, they are very good at strategic planning at the district level. That board managed to make that district number one in students’ achievement.

Mary suggests that the BOTs contribute to generating new ideas and concepts. She stresses the importance of raising awareness of local communities, families and parents and the positive effects this would have on education when she shares:

> The Boards of Trustees raised some new ideas, some new concepts in the Egyptian society. People who are interested can be members in the Boards of Trustees. This is a governance body. A very important governance body. There are lots of contributions. Many people, individual citizens at micro level have raised interest in education. They are donating their time and money. They are building schools. Definitely, awareness is a factor, and education is a factor. Every family is suffering from the education system, so many individuals are motivated enough to try to help out if they can help out.

Jack suggests that the BOTs are important, however, they are not enough. He refers to the BOTs as one arm of the two arms of community participation at the local level. He states that community participation can be enhanced with the presence and involvement of the elected local councils that would provide more room for participation and open new windows for citizens to get their voices heard. He explains:

> The BOTs are just one arm. Right now, we do not have elected councils at the local level. I think if this takes place, and I know the country in the process of doing this after doing this at the central level. If this takes place along with the BOT, I think there will be an available structure for citizens to vote their opinions and to voice their concerns and be heard at the local level. I think this is important. Right now, it is only the BOT and maybe it is not sufficient.

The Boards of Trustees' Challenges

There are several challenges hindering the effective implementation of the BOTs in Egypt including their weak roles, the lack of awareness forums that encourage parents and local communities to participate and support schools to realize their desired objectives. Some schools have not even activated the BOTs and do not participate in local community activities. Moreover, there is a lack of cooperation between the BOTs and other organizations to implement activities that benefit schools and a lack of using school buildings and resources to provide community services and activities (National Center for Examinations and Educational Evaluation) (NCEEE), 2015).

The participants identify a set of challenges that negatively affect the BOTs and their performance including scaling-up failure, the lack of effectiveness, the lack of incentives and monitoring, and the lack of awareness.

Scaling-up Failure

Mary refers to the inability of the MOE to scale-up successful pilots as one of the most serious issues that undermine the success of education reforms. She justifies the scaling-up failure by the lack of clear regulations, the lack of capacity, and the lack of financial resources. The BOTs are not an exception. The implementation of the BOTs was successful in some governorates such as Alexandria because of the availability of successful factors that are not necessarily available in other governorates. Mary suggests:

> Scaling up is not only a problem for the BOTs. Scaling up is a problem for everything. Donors spend money on projects as pilots like the Alexandria BOT. That is one example, but they do not get scaled up because the Ministry does not know how to scale up. The Ministry needs capacity for scaling-up. In order to do that, you have to change the law. You need to change certain regulations and legislations. You need to have a budget. You need to have a scaling-up plan and the Ministry does not have the capacity for this. The BOTs are not scaled up and many other similar initiatives. It is because you have a model. The Ministry takes the model and puts it in a decree. This model was not created out of a decree. This was created out of an initiative. In order to have anything scaled-up, you need to create the same conditions. The reform must be inside a context. If you take it out of its context, it does not succeed.

Mark explains that the implementation of the BOTs and their performance in Egypt vary widely from one governorate to another. That variation can be justified by the great discrepancies among governorates in their resources and capacities as he explains:

> It is different from one governorate to another. But when you talk about Alexandria, you are talking about urban governorate, where there is a huge awareness, and a number of the Boards of Trustees' members are big businessmen in Alexandria. They have large amounts of money that can support education system in Alexandria. So, it was successful. This is not applied to other governorates. If you measure it on a measure from zero to ten, you may have from two to seven for instance.

Sandy stresses the fact that the impact of the BOTs depends to a great extent on their members as the composition of those boards vary widely among schools. Members' education, socio-economic, positions and connections can absolutely influence their contributions and affect their performance.

Lack of Effectiveness

Suzanne suggests that the lack of effectiveness is one of the serious challenges that hinder the successful implementation of the BOTs in Egypt. Though there are various efforts exerted by the BOTs all over the country, those efforts should have a clear direction to ensure their positive impacts on the education sector. For Suzanne:

> You have the Boards of Trustees. You have infrastructure for this participation. For each school, you have a Board of Trustees that is supposed to come from the community and from parents. This is, definitely, a good thing. You will find a lot of work done at schools by people. Even at the local level, you will find people donating to schools. There is an interest in supporting the whole system, but it is not directed in the right direction and there is no coordination for these efforts.

Adam indicates that the BOTs are good structures with opportunities to enhance governance and improve participation within the education sector. However, he concludes that reducing their authorities and limiting their roles have resulted in reducing their positive impacts. He explains: "Boards of Trustees are good, but a change happened through taking out some of the responsibilities of these boards which decreased their impact. The system in Egypt is not that institutionalized and this is the case in many developing countries".

Ramzy suggests that controlling and tying the BOTs with a lot of rules and regulations hinder them from implementing their school improvement plans and doing what they should do. He states: "If you are going to tie them with a lot of rules, that is going to prevent them from implementing what they want for their schools".

Lack of Incentives and Monitoring

Peter indicates that the BOTs are supposed to enhance participation in education. However, he suggests the necessity of taking the required measures to activate, empower and encourage them to take their

responsibilities and realize their goals. One of the mechanisms he recommends is the use of incentives, not only financial, but also in their different forms. In Peter's view:

> Now you have these platforms that are supposed to enable participation. You need a series of measures to enable them to work which means proper outreach, proper moderation, maybe sometimes also incentives for people to participate. When I talk about incentives, I mean incentives in a broad general way. It does not always have to be related to money. It can be recognition or satisfaction that something, an idea that you provided, is now being implemented.

Sarah criticizes the negative position of the MOE in monitoring the performance of the BOTs and ensure they practise their authorities and take their responsibilities effectively. She raises concerns and doubts about the lack of support required for enhancing the BOTs' performance as well as the knowledge and skills of social workers who are supposed to facilitate the work of the BOTs when she asks:

> What is the role of the Ministry of Education? These are the people who are elected, then what? You just leave them? Go and do whatever they want to do? Even social workers who are responsible for the Boards of Trustees, what knowledge and skills they have about this? How much do they know about good governance? How much do they know? What needs to be done and what should be done?

Lack of Awareness

Sarah refers to the lack of awareness from the BOTs' members as one of the biggest challenges facing the effective implementation of those structures. She suggests that the BOTs' members should fully understand their roles, responsibilities and authorities to succeed. She explains:

> They need to understand the responsibilities before they nominate themselves to be elected. There are responsibilities they have to take. Maybe the government needs to revisit roles and responsibilities and level of authority given to the Boards of Trustees and whether the individuals who are sitting in those boards are prepared for these roles or not. Are they aware of what is required from them to start with? Do they understand what their roles are? Do they understand what it means to be a member of the board? Does any entity monitor the

> performance of the boards? What happens if the board is not really performing or helping the school? If you are elected in the board and you do not perform, and do not show up, what happens? I am taking it back to awareness because those who are not that much educated, you can help them.

Sarah, in response to a question on why she thinks the implementation of the BOTs were successful in Alexandria and are not doing that well in other governorates, stresses the importance of enhancing awareness of the BOTs and local communities when she shares:

> There were more awareness campaigns about what they are; what is expected from the communities; schools were open to the communities to go and see; not just to pay money and are not involved. People were well informed about what is happening. There was proper monitoring so on and so forth. When you go to scale, you lose all these things.

III- Non-Governmental Organizations (NGOs)

NGOs are "interest groups of active individuals outside the governmental framework. They act independently on different issues" (UNDP, 2003, p. 68). The difficulties associated with scaling-up and ensuring sustainability is one of the common obstacles facing the interventions of NGOs in general as they are often local and project-based on a small scale and many of those projects prove to be short-lived. That can be understood in the light of the lack of resources and qualified well-trained capacity (Ulleberg, 2009).

Egypt is described as possessing one of the largest and most vibrant civil society in the developing world (Ministry of International Cooperation, 2016). However, such generalizing statements should be considered carefully and critically, as there are a lot of serious challenges that face NGOs and hinder their work.

Though the history of civil society in Egypt can be traced back to the nineteenth century, they still face serious challenges and severe restrictions. They are not allowed to receive any foreign funds without permission from the Ministry of Social Solidarity. They are not allowed to engage in any political activity unless they are registered as political parties. The Ministry of Social Solidarity has the right to dissolve any NGO that performs illegal operations. In June 2015, the total number of NGOs reached 45,034. The highest percentages of NGOs are located in governorates of

Cairo, Giza and Alexandria; (18%, 10% and 7%, respectively), whereas South Saini has the lowest with a percentage of 0.3%. This can be justified by the population of governorates and the low attention towards establishing NGOs at the frontier governorates (Amin, 2015).

NGOs are presented according to the following sub-themes: Implementers and Service Providers; Suspicion and Strict Control; Capacity Variation; Unsupportive Climate and Bureaucracy; and Foreign Fund Dilemma.

Implementers and Service Providers

Suzanne describes NGOs as powerful implementers with strong and varied experiences and effective outreach mechanisms. However, she stresses that NGOs are totally ignored and avoided by national authorities. Authorities normally look at those organizations with a lot of suspicion and doubts, especially those who receive international funds. Suzanne explains:

> NGOs have good experiences at the school-level. They have good experiences with students. They have good experiences with teacher training. There are a lot of teachers' trainings going on by NGOs. Even dealing with students directly for supporting the fees of the school. I think they are not involved. They are out of the picture in a way. But, I think they are ignored. They are totally ignored.

Mary praises the potential huge contributions of NGOs and their capacity to do excellent work at the grassroots level with communities and schools if they are provided with the right supportive atmosphere. She finds that NGOs possess several strengths in certain areas such as awareness campaigns, outreach, resources mobilization, and school construction. She continues:

> NGOs can make excellent work, with communities and community schooling. They have already in the past, but the Ministry needs to have oversight. NGOs are very good at raising awareness. They are very good at campaigns. They are very good at helping communities to mobilize resources. They are good at establishing community schools. But these are not good days for NGOs; maybe in the future. NGOs are very important. They are implementers. They are grassroots implementers and they are the closest to people, families, and communities. They have more outreach especially in villages, helmets and areas with poverty.

Sarah confirms that NGOs in Egypt contribute to the education sector in many positive ways. She states that:

> NGOs have done lots and lots of very good pilots for education reform; Community Schools is one example. They did a lot of curricula to help children, educate and provide them with life skills. Particularly in non-formal education, they have done a lot of good things. In technical and vocational education, they work with business owners. They can reach communities that the Ministry of Education can not reach because they are on the ground and know how to reach different communities.

Adam describes NGOs as service providers rather than decision-makers within the education sector concluding that certain educational areas need more involvement of NGOs such as the nexus between education and disabilities. Adam clarifies:

> We have organizations working on education but mainly they provide services. They are not interested in decision-making and accountability aspects. Currently, some of the organizations start working on accountability and policy-making aspects. During the preparation of Egypt 2030 strategy, the Ministry of Planning and the Ministry of Education invited a considerable number of civils society representatives to participate in the formulation of this panel. I think there are issues like disabilities that receives no attention from the civil society and so on. Till now, I think, it is very limited.

Suspicion and Strict Control

For long times, NGOs working in Egypt were met with suspicion by national authorities even before the January 25th revolution 2011, and this was especially true for those organizations focusing on political themes such as democratization and political rights. One of the strongest reasons the government deals with NGOs with a lot of suspicion is that some of them have hidden agendas including the spread of extremist thoughts and recruiting new members for extremist groups.

NGOs, working in Egypt, have no friends. That was the way Mary describes the state of suspicion, isolation, neglect and avoidance NGOs face. She states: “NGOs are not the friends of the Ministry of Education. they are not the friends of the Ministry of Social Solidarity. They are nobody’s

friends. They look at them with suspicion, a lot of suspicion even before the revolution".

Suzanne describes that the Government of Egypt cannot be blamed and has strong justification to deal with NGOs with suspicion as many of them proved to have malignant hidden agendas. She, however, blames the government for not assessing NGOs, understanding their previous experiences, advising and directing them when she says:

> I do not blame the government for being suspicious towards NGOs. We have a lot of cases. High percentage of the children come from poor families. Sometimes NGOs are not allowed to get into the schools. Even those implementing projects for donors sometimes are not allowed to enter schools. Definitely, they look at them with suspicion. Sometimes it is justifiable and sometimes it is not. However, there is no a proper assessment of NGOs. What are their previous experiences? They can sit with them, assess them, advise them, and direct them, but this link does not exist.

Sarah presents a similar point of view stating that:

> Currently, they are now in a very awkward position particularly with security. During last period, some NGOs were discovered to have political interests that made them on the spot. It is the same as what is facing us as well. Security clearance every step of the way makes it really very difficult.

Mary refers to the issue of "control" that undermines the impact of various efforts of NGOs and prevents them from contributing to the education sector in a more effective way. She indicates that the MOE wants to fully control those organizations and their activities. That can be understood in the light of the suspicion and doubts associated with NGOs. In other words, because the government deals with NGOs with a lot of suspicions and doubts, it puts them under strict control, which impacts negatively their performance. As Mary sees it:

> NGOs have two challenges: The Ministry of Education wants to control them completely. So, when they are completely under control, it is frustrating. Number two when they start working with the Ministry, governorate, district, they get caught. That is why it is very

difficult for donors and very difficult for NGOs to work with the Ministry.

Capacity Variation

The NGO sector in Egypt witnesses a wide variation among different NGOs' capacity. Sarah suggests that most NGOs still need a lot of training and get their capacity built. In making this point, Sarah notes:

> Capacity of the staff working there, they need a lot of support in this regard. In this sector, you will find few good NGOs at a high level who are familiar with proposals writing and getting funds so on and so forth. Then, you will find the grassroots community associations. This space in the middle is a bit empty. That is what is required and that is what we need. We need to train more NGOs to do better work in education.

Unsupportive Climate and Bureaucracy

In Egypt, the mechanisms of participation by NGOs are weak for several reasons including the restrictive NGO laws; weak NGO infrastructure; and the feeling among the populace that their involvement will have little impact. More efforts need to be done to enhance participation such as decentralizing decision-making and facilitating the roles of the NGOs involved in providing social services (El-Saharty, Richardson and Chase, 2005).

Peter implies that what can be seen on paper is very different from what is observed on the ground. That is because of the lack of supportive climate for such reforms. The government normally blocks a lot of NGOs on purpose because of its suspicion of their agendas. This practice from the Egyptian authorities does not only affect NGOs and their performance, but also international organizations and their initiatives as they rely on NGOs as implementers. As Peter clarifies:

> Setting up participative platforms is very nice on paper and is really useful whenever there is an enabling environment for this type of processes to take place. What we observed here in Egypt is that currently the government is not enabling this type of processes. A lot of civil society engagement is blocked. We have some programs which were heavily based on NGOs to implement certain things especially related to outreach to certain communities. We do not know how to reach or have not built trust yet. And we found strong

difficulty to implement these programs because of the current climate we have and the legal framework.

Mary identifies the bureaucracies and complexities within the education sector as main challenges facing different national and international, including the NGOs. They undermine exerted efforts in many ways and are responsible to a great extent for the lack of effectiveness and efficiency within the sector. For Mary:

> These are the challenges: The bureaucracies and complexities of the education sector and the fact they need to be controlled. It may take four or five months, for an NGO to get an approval to work with the Ministry of Education. Hopefully, this will be only temporarily.

Foreign Fund Dilemma

NGOs in Egypt are under threat and as a result many organizations reduce their activities, cease operations, or move outside the country. Egypt accuses NGOs of acting as agents for various nefarious actors, which creates a climate of hostility that discourages the pursuit of NGOs' work. The government made it very risky for NGOs to pursue foreign funding, which undermines their ability to maintain staff, continue operations and implement their activities. The government officials often declare that funding approval is an issue of transparency or combating foreign plots (Ruffner, 2015).

Peter mentions that a lot of cooperation between international organizations with NGOs is blocked because of the unsupportive climate controlling NGOs. Sometimes, international organization are not able to pay for NGOs to implement some activities because of the suspicions associated with foreign funds. This means that efforts and initiatives of international organizations are affected directly in a negative way by the challenges facing NGOs.

Peter stresses the importance of political will of the Egyptian authorities in facilitating and supporting such cooperation between international organizations and NGOs. Without that political will, that cooperation cannot work. In Peter's words:

> It is difficult to pay a civil society organization to do something because it is foreign funding. On paper, we all know it is very important and it has to be done and that it is useful when carried out. But, first of all, it requires the political will of your partner. If it does

not see it as a priority, then it will be a terminal for us to do it in any way because it will not work.

CONCLUSION

In Egypt, the lack of community participation or the lack of effective participation in the education sector has a lot of interactive factors within a very complex, complicated and demotivating context. Those factors include the lack of trust between the public and government; the high incidence of poverty that makes people more focused on getting and fulfilling their needs; and the lack of awareness and education. It is true there are several positive examples of community participation even from the side of the poor who contribute to enhancing education process and school environment in different ways. However, the participation level is not satisfactory and there is still huge potential for improvement.

Enhancing participation can be seen as one of the top priorities and solutions to be adopted by the government; especially with over-centralization of the education sector and its very tight budget. It is one of the most effective mechanisms to improve education governance by getting communities, families and parents more involved in education and taking more responsibilities in decision-making processes. It is the gateway for increasing and utilizing available resources required by the education sector. To encourage and support effective participation within the education sector, there are a lot that need to be done to enable the context and create a more supportive environment

RECOMMENDATIONS

The following recommendations may be considered by stakeholders to enhance participation in the pre-university education Sector. They are presented in two sections: 1) The government of Egypt and 2) The Ministry of Education:

The Government of Egypt

1. Reviewing and redistributing authorities and responsibilities within the pre-university education sector. It is crucial to intensively consult and carefully investigate what authorities and responsibilities are to be delegated or devolved from the central level and to what level.
2. Moving towards a more decentralized education sector supported by the highest level of political leadership, commitment and will.

Achieving decentralization is a mutual responsibility that requires strong political commitment, will and collaboration among different national organizations including the Presidency, the Cabinet, MOF, the Ministry of Local Development, the Ministry of Social Solidarity and the MOE. It has been demonstrated on the ground that the current rigid bureaucratic management education system is unable to manage efficiently and effectively that huge sector.

3. Implementing financial decentralization as a key step for moving towards actual education decentralization. It requires a direct intervention and support from the MOF. Without financial decentralization, there will be no real decentralization within the education sector as finance always controls the decision-making processes.
4. Enhancing awareness of the public and local communities regarding the importance of education and the possible ways they can contribute to the education sector. That can enhance the level of community participation in the education sector.
5. Attracting, encouraging and empowering NGOs to contribute more effectively to the pre-university education sector.
6. Reducing security procedures and barriers imposed on NGOs considering NGOs as real partners and powerful implementers to maximize their contributions to the education sector.

The Ministry of Education

1. Encouraging and supporting participation of local communities to maximize their contributions to the education sector, allow them to take part in monitoring, evaluation, decision-making and management processes.
2. Reviewing responsibilities, authorities and roles of the BOTs to maximize their impact on the education sector, its governance and management and decision-making processes in a more effective way.
3. Empowering and enhancing the performance of BOTs at all levels. The BOTs, especially at the school level, can have a very positive and direct impact on enhancing school environment and learning/teaching processes.
4. Providing effective training programs and building capacity of the BOTs. Once recruited, BOTs' members should be trained and supported to ensure their effective inputs and participation.

5. Encouraging and attracting well-qualified and enthusiastic members to the BOTs.
6. Rebuilding strong relationships of coordination, consultation and trust with NGOs. Cooperating with NGOs as real partners and effective contributors to the education sector would facilitate, enhance and maximize their roles, responsibilities and contributions.

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Let All Voices Be Heard: Exploring International Students' Communication Challenges in the Internationalized Classroom

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ABSTRACT

In many cases, faculty and staff are unaware of the unique challenges that international students experience in classrooms, and teaching priorities may not be aligned with the learning needs. To address the gap in perspectives between students and faculty/staff, this focus group study involved international students, staff, faculty and instructors. The purpose is to identify barriers that international students face in cross-cultural interaction and develop strategies that faculty and staff can use to provide effective support. The study reveals multi-layered challenges that cross-cultural transition and language barriers can create for international students, and roles of domestic students in cross-cultural interactions. The resulting discussion highlights teaching and advising strategies that faculty/staff can employ to enhance the learning experience for international students.

Keywords: Cross-cultural Communication, Cross-cultural Interaction, International Students, International Student Advising, Intercultural Pedagogy

INTRODUCTION

In an increasingly globalized world, providing students with learning opportunities that will further develop their intercultural competencies is an invaluable component of a college education (Lee, Poch, Shaw, & Williams, 2012). While many types of educational activities may help to foster these skills, the presence of international students in classrooms across the U.S. increases the chances for all students to learn and engage with diverse perspectives. When provided with structured opportunities, American students can learn valuable information about international students' home cultures, and international students can contribute unique insights to the learning process (Leask, 2009). In U.S. classrooms, discussion-based and student-oriented teaching styles dominate; however, these active learning approaches are not necessarily familiar to some international students (Smithee, Greenblatt, & Eland, 2004). Even though international students may be aware of this difference prior to their arrival, in practice, it is not intuitive to shift to a different mode of teaching and learning (Yu, Isensee, & Barbara, 2016). To assist international students with their transition to U.S. campuses, faculty and staff need to make time to deepen their understanding of the uniqueness of international students' prior experiences and diverse learning styles. With strategic support from faculty and staff, students from all backgrounds can benefit by increasing their intercultural knowledge when they have opportunities to interact more effectively across language and cultural barriers.

Research Questions

To gain a greater understanding of communication challenges that international students experience and how faculty and staff try to support students to navigate those challenges, this study aims to answer two main research questions outlined below. These research questions were also evolved after reviewing the findings from previous research completed at the same institution (Peters & Anderson, 2017).

1. What factors contribute to the communication and interaction challenges that international student experience?
2. What strategies do students, faculty, and staff identify as important in providing support to international students?

METHOD

Focus group methodology was selected to provide in-depth and elaborated perspectives to explore the research questions. This study is approved by the university's Institutional Review Board (IRB) where the authors work at.

Participants were recruited and selected considering their demographic background and colleges/offices they are at.

Table 1: Overview of focus group participants

Participant Type	Number of Participants	Number of Focus Groups
International Students	18	3
Teaching Assistants	9	2
Instructors and Faculty	13	3
Staff	30	5
Totals	70	13

Focus groups were conducted using a semi-structured interview protocol. Focus group questions were tailored slightly to fit the population represented by each focus group (international students, teaching assistants, instructors & faculty, and staff). Each focus group lasted approximately 60 minutes and were co-facilitated by the authors. All focus groups were audio recorded upon permission. Detailed notes about participants' responses were also recorded during each session.

Once all the focus group sessions were complete, the audio recordings were transcribed by an outside transcription service, rev.com. Transcriptions were imported into Excel and the researchers then used an open coding process to analyze the transcriptions. This involved first analyzing each sentence of the interview transcripts, and then choosing to assign a code to a segment that held meaning relevant to the research questions (Maxwell, 2013). After analyzing the transcripts at the sentence level using this method, the two researchers agreed upon categories by reviewing the relationships between codes or clusters of similar codes (Shank, 2006). As a final step, broader themes were identified that corresponded to our research questions (Yin, 2014).

FINDINGS

In this study, student participants discussed the challenges of learning how to use academic English in interactive classrooms and described the cultural barriers they faced. Participants from all focus groups emphasized peer interactions, particularly with U.S. peers, as a primary area of concern. Faculty and staff participants also discussed concerns about various

difficulties with referring students to campus resources, including knowing which resources would be helpful for students among other challenges. Specific themes related to each research question are described below, with selected quotes provided.

Research Question 1: What factors contribute to the communication and interaction challenges that international student experience?

Theme 1a: The challenges international students experience are multi-layered, meaning they encounter barriers related to both language and culture, as well as many other factors. Some faculty and staff participants did not always attribute the barriers that students experienced to primarily one challenge - instead, in many cases they described a "multi-layering of things" that often creates compounded barriers for students. For example, if the challenge students are experiencing is primarily related to language barriers or cultural difficulties, it may also be impacted by emotional stress, previous educational preparation, financial limitations, mental health concerns, and pressures from family, among other things.

> "But it's emotional for them, like every time, every second. Like when they mispronounce something, or you know, every moment of that navigation is emotional, to recognize and, and work with that. But I think it needs to be though, because living in a different country with different languages it's a traumatic experience in some ways. And it's a mental drain for trying to understand everything" (Staff participant).

> "There's some intersection, I think, between cases of this type and family pressures. When you talk to students, you hear students describe a lot of pressure, family expectations back home and, graduation timelines, and visa timelines, such concerns about completing a program. It can cause heightened anxiety, it can cause plagiarism, but it can also complicate the resolution process too" (Faculty participant).

Student participants explained that they experienced the most intense language barriers when they first arrived in the U.S. Some students discussed speaking in academic settings (presentations, discussions, and other interactions) as their most difficult challenge, and several highlighted how difficult it can be to learn and use academic vocabulary. Similar to perception of faculty and staff participants, when comparing language and cultural barriers, many students perceived cultural barriers to be more complex and more integral to their ability to form successful social networks. Some students commented that improving their language proficiency was more straightforward because they could identify opportunities to practice, but

acclimating to culture and developing their sociocultural knowledge took a longer time and more ambiguous.

> "After a while I think most of us here speak pretty good English and don't have such problems anymore. Then after that, it's more of a culture thing I think. People who grow up here like, how they party is different from the way we hang out. And I cannot make conversations with them about those TV shows and songs they grew up with" (Student participant).

Theme 1b: Navigating campus bureaucracy is challenging. Faculty and staff participants described a range of challenges they perceive students to have when acclimating to various expectations in the campus environment, including navigating administrative policies, the advising system, and classroom expectations; finding a supportive network; and identifying and using the appropriate supporting resources. Representative quotes include:

> "When students, particularly international students, first come to campus, they are arriving right before school starts, when course selection is at its worst with additional processing time. If they are transfer students or a new freshman from another country from a non-native English-speaking country, it is very challenging to register in a timely manner" (Staff participant).

> "I think that admissions and the colleges and departments need to do a better job of helping students navigate that process, which is often times having to be compressed into a three-day period. We're advising them on Friday, and then they're having to decide what classes they're going to take on the following Tuesday after Labor Day. That's bewildering for anybody, let alone somebody who has these additional challenges to negotiate" (Faculty participant).

Theme 1c: Cross-cultural communication is a "two-way street". Faculty and staff described challenges they observed in students' cross-national interactions both in and out of the classrooms. While there was some discussion about the tendency that international students have to segregate into monocultural groups, participants also expressed concerns about the need to better prepare domestic students to interact with international students.

> "I don't know what to do to make domestic students nicer and more inclusive. I wish they'd just not be ignorant" (Staff participant).

> "There is clearly a cultural difference in how they [international students] engage in groups. Their comfort level with their English exacerbates that issue significantly. So, they typically are more likely to sit back and observe and not interject and participate until the other team members have built some relationships, which some of the [domestic] students aren't very good at. They're very task focused and so I try and coach them, you know, to do more of that" (Faculty participant).

> "When you work in a group, others [domestic students] are working and talking fluently. And I can't interrupt them, or to slow down the whole process as a group. So, I never stop them, and I am just following quietly" (Student participant).

Research Question 2: What strategies do students, faculty, and staff identify as important in providing support to international students?

Theme 2a: Facilitate a connection among international students with other students. Faculty, staff, and student participants discussed the importance of creating "a connection with students" as a key strategy for support. Sub themes include creating peer mentoring opportunities, intentionally assigning mixed small groups to promote interaction and participation in class, and even structuring "forced interactions" when necessary as a way to help students become more comfortable interacting with each other over time.

> "In the context of those group discussions, I think they probably feel less comfortable speaking up. It's reduced by a little bit when you put them into smaller groups. They'll have groups of three or four in which they work on projects and workshop and talk with one another. In that context I think people talk a lot more freely and can make progress" (TA participant).

> "In my classes for group work, if you let them choose their groups, all of the Chinese students go to one group, right, and then, you know, you get the other group over here, and you get the athletes over there. I have to forcibly mix them up, and don't allow them to form their own group" (Faculty participant).

Theme 2b: Build trust with students. Some TA and staff participants described the importance of building trusted relationships in faculty-student and staff-student interactions. These participants described the importance of communicating in a way that demonstrates care, compassion, and investment in student success. A few students also

mentioned the important and ways that faculty and staff could build a trusted relationship during teaching and advising.

> "It's a balance because it's putting pressure on students but also I find that when I meet with students, they see that I care. I always tell my students that it doesn't make me happy to see you not succeed. It doesn't give me any pleasure to give a failing grade. When I say those types of things, then they know that I'm rooting for them. It also helped plant a seed for my students being responsible, being accountable, and not hesitate seeking out learning resources from me" (TA participant).

> "I really want them to do well, and I tell them, I'm investing in your success, really like a family member. Not just saying it, but acting that way, and they really feel for it, and then they're gonna listen to what I have to say and probably follow my advice because they trust me" (Staff participant).

Theme 2c: Normalize language development progress and help-seeking. Faculty and staff participants described that successful international students as those who were persistent in their determination to overcome language, cultural, or other barriers. Some expressed concern that a reluctance to ask for help would limit students' abilities to be successful in their academics. Specific perspectives that help to illustrate this concept of student self-advocacy include the willingness to ask questions, identifying and using campus resources, recognizing that it is okay to make mistakes, and confidence in their individuality and strengths. Many participants discussed about ways to normalize help-seeking for all students. A few TAs also highlighted their belief that all students were learning the language of their discipline, and how this realization helped to reframe how they viewed all students' contributions in class.

> "I was always told that the best students are the ones who are asking for help. Professors on campus are encouraging it, and they are happy to see you asking questions and trying and wanting to do well. I think that's maybe a distinction that I've seen among students" (TA participant).

> "The ones that are not afraid to say, 'I do not understand,' or, 'Can you tell me again?' or will come back the next day and ask the same questions are the ones that succeed. I think depending on where they're from, they probably don't have the habits asking or saying that they need help or dealing with a lot of emotional and mental transition" (Staff participant).

Theme 2d: Guide international students using to better utilize campus resources. Participants discussed different ideas for how to increase resource awareness at the faculty and staff level, such as visiting department meetings, brown bag lunch sessions, etc., to get to know more about international student's ever-changing needs and how to assist with their success and wellness. TAs and faculty explained their methods for referring students to resources in a mindful way considering international student's cultural background. In general, students described their appreciation for various resources on campus, and expressed receptivity to resource referrals if they could tell that faculty were genuinely trying to be helpful and caring.

> "I think one of the barriers for me was knowing where to direct them if it wasn't my skill set. I only suggest the available resources I can do to suggest. But it took me a lot of time searching to find those sources. Our course coordinators don't like to make those super readily available to us" (TA participant).

> "One thing that is an issue is to figure out where to send students for support. I'd like a list of resources, like if you have non-native speakers who has a paper assignment, here's a resource to help them… I'd like the resources sent by emails straight to faculty" (Faculty participant).

DISCUSSIONS AND CONCLUSIONS

Faculty and staff will be better prepared to support international students when they are more aware of the "multilayered" factors that influence students' experiences. As some staff participants described, the challenges that international students face are complicated and compounded by many possible variables, such as emotional stressors associated with cultural transitions, the tedious and exhausting experience of studying in a second language, navigating unfamiliar academic expectations, and the difficulties of trying to establish a new support network. Student participants illustrated these multilayered challenges when they expressed anxieties about their confidence levels, speaking proficiency, and their ability to negotiate cultural and social dynamics in group discussions.

All students may benefit from resources and training that prepares them to interact more effectively across language and cultural barriers. Student participants expressed that one of their greatest challenges, beyond even the difficulties of learning and using academic English, was interacting with U.S. peers and navigating group dynamics. International students have frustrations from U.S. students' lack of interest in getting to know them or including them in group discussions. TA, staff, and instructors echoed these

concerns, stating from observations that U.S. students often seem to lack of motivation when engaging with international students in classroom or co-curricular settings. Students explained that while they could identify tangible strategies to improve their English, and time spent in the culture facilitated this, some found it harder to navigate discussions and social interactions that required cultural insider knowledge.

Critically important, simply advising students to improve English will likely not resolve the challenges they face. Students also need support to overcome cultural differences. The cultural differences are not only in forms of language or accent, but also can be reflected on how international students prefer to participate in classes, how they engage with faculty and peers, and how they might seek help when needed. Faculty and staff need to make efforts to deepen understanding of diverse cultural values that international students bring to campus and learn how to work with proficiently with students from various backgrounds. Suggestions for faculty and instructional staff to cope with cultural variance in classrooms may include providing explicit academic expectations, incorporating a variety of ways to present learning materials, facilitating opportunities for meaningful interactions among students and instructors, and being patient and allowing time for non-native English speakers to practice and grow by providing exemplary performance (Carnegie Mellon University, 2014).

Students may become more confident self-advocates and better "navigate campus bureaucracy," if faculty and staff can develop supportive subcultures in which language development and support-seeking are normalized. Self-advocacy behaviors named by faculty and staff participants included asking questions regularly, using resources proactively, and finding opportunities to network and be involved. Considering the effort students may need to exert when navigating various forms of campus bureaucracy, and the compounding influence of culture and language difficulties, international students may benefit from faculty and staff advocates who seek to minimize barriers and normalize help-seeking.

It is also clear that resource awareness is a high priority for faculty and staff. More strategic and comprehensive outreach from offices that offer support to international students could be helpful to address this gap. Furthermore, faculty and staff may also need to identify new ways of communicating to both colleagues and students about resources.

In conclusion, institutions shall systemize and customize supporting resources taking international students' needs into account. A starting point is to get to know our international students, as well as at an individual level without any assumption knowing that they are all from different parts of the world and they might be quite different even if they are from the same country. Recognizing international students' contributions to U.S. campuses and assisting international students perceived academic challenges is a shared responsibility for the institution and all people on our campus.

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(Un)Disciplining Interdisciplinarity: Root Metaphors, Matrices, and the Limits of Psychology in Postmodern Education

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ABSTRACT

In interdisciplinary education, metaphors often provide the epistemological clarity that is lacking in our definitions and theories of interdisciplinarity. The problem is that ineffective and unsubstantiated metaphors proliferate. We lack a root metaphor or shared world view of interdisciplinarity. Is it time that we move away from thinking in terms of metaphors? Some instrumentalists in interdisciplinary studies argue yes and propose a pragmatic constructionist approach for interdisciplinary education. This theoretical study determines that this proposal is incomplete. It reveals that an intertextual view of interdisciplinarity is not only more appropriate, but it integrates the competing theoretical and pedagogical approaches in the field. This article also identifies "the matrix" as the metaphor best positioned to sustain this integration and to bridge the widening gap between disciplines.

Keywords: Activity Theory, Dialogism, Interdisciplinary Theory

INTRODUCTION

Interdisciplinarians tend to turn to the world of metaphors to provide the epistemological clarity that is often lacking in our multi-dimensional definitions and theoretical rationales for interdisciplinarity (Graff, 2015; Jacobs, 2013; Lattuca, 2001; Moran, 2010; Newell, 2013; Nissani, 1997; Ribeiro & Relvas, 2018). However, some metaphors work better than others, and this explains why many of the metaphors for interdisciplinarity are unsustainable. Interdisciplinarity lacks what Pepper (1942) and Botha (2009) call a *root metaphor.* In other words, we do not have a shared world view of interdisciplinarity or its definitions, theories, practices, or assessments. Instead, we have a proliferation of terms and metaphors that do more to confuse than clarify interdisciplinary theory and practice (Newell, 2001). According to Klein (1996), "Interdisciplinary activities and processes cannot be depicted in a single image. The metaphor of a web, a network, and a system are often invoked" (p. 19). More creative metaphors include fish scales (Campbell, 1969) and fractals (Mackey, 2002). Piso (2015) is one of the few writers who examine critiques of metaphors in interdisciplinary studies by scholars such as Veronica Boix Mansilla. Piso (2015) describes how linguistic metaphors can inform our understanding of integration in interdisciplinary studies, but he does not fully consider the theoretical underpinnings of Boix Mansilla's criticisms. What if Piso (2015) had explored his dialogic perspective in the context of Boix Mansilla's critique of metaphors? Would this support or challenge her call for a psychological study of interdisciplinary learning based on constructionist theory? Returning to Boix Mansilla's concerns about the role that metaphors play in interdisciplinarity will provide us with an opportunity to examine these questions in order to determine whether metaphors do more to improve or hinder our understanding of theory and practice in interdisciplinary education.

Boix Mansilla (2010) identifies crossroads, trading zones, and bridges as examples of other metaphors used by interdisciplinarians to explain interdisciplinary intellectual activities. According to Boix Mansilla (2010), "Metaphors have served us well as evocative approximations to interdisciplinary cognition. However, they have proven less productive in their ability to structure strong research agendas or to design empirically grounded programs on interdisciplinary learning and its assessment" (p. 289). She proposes a move away from the "evocative language" of metaphor in order to better illuminate "the phenomenon of interdisciplinary learning in epistemological and cognitive terms" (pp. 288-289). Boix

Mansilla (2010) claims that psychological studies of interdisciplinary learning and cognition are scarce but needed to provide the generative epistemological foundation for interdisciplinary education that she claims we are missing. To advance her case, Boix Mansilla (2010) calls for a pragmatic constructionist view of interdisciplinary education as a way to account for the various activities that we have come to associate with interdisciplinarity, particularly integration (pp. 288-289). The problem is that scholars across the disciplines indicate that her proposal provides an incomplete assessment of learning, interdisciplinarity, and particularly psychology (Berger & Luckmann, 1967; Derrida, 1978; Frodeman, 2014; Klein, 1996; Klempe, 2018; Kvale, 1992; Tennant, 2000; Usher & Edwards, 1994). Shotter (1991) offers a useful synthesis of the major concerns that we have with Boix Mansilla's reliance on what critics see as academic or mainstream psychology's attachment to scientific paradigms (also see Holzman & Morss, 2000). He concludes that cognitive psychology's veneration for scientism has resulted in inadequate explanations of its subject matter. Shotter (1991) claims that "the cognitive approach ignores both the role of social and rhetorical processes in its own creation" (p. 498). Reductive, objective, and empirical formulations for the explication of mental processes can never be completely reliable. Cognitive psychology is better illuminated by metaphors and the tools that effectuate human existence: language and conversation (pp. 501-507). Cognitive abilities must be assessed in terms of what people say and do and not "the myths of the mind." Shotter (1993) agrees that a rhetorical turn in psychology and other disciplines is a significant departure from the instrumental, ahistorical, and reductive conceptualizations of cognitivism that disproportionally influence research, teaching, and learning for instrumentalists in interdisciplinary studies (see examples in Augsburg, 2005; Newell, 2013; Repko & Szostak, 2017).

Boix Mansilla's theory of interdisciplinarity is yet another example of instrumental interdisciplinarity and the shadow it casts over conceptual interdisciplinarity. To navigate interdisciplinarity's complex landscape, Lattuca (2001) develops a typology that helps us to define instrumental and conceptual interdisciplinarity. Though her views are contested among scholars in interdisciplinary studies, Lattuca (2001) claims that the instrumental approach is more practical, methodical, and oriented toward problem-solving and research. The critical or conceptual approach is more theoretical, nonlinear, and oriented toward challenging knowledge structures (pp. 10-12). In her study of the typologies in interdisciplinarity, Klein (2017) describes this distinction as the "fault line" in the current discourse in interdisciplinary studies. Klein's assessment is poignant because it

represents "conflicting energies" that are linked and divided by the kind of hierarchization that substantiates disciplinarity (Foucault, 1995, p. 104). This paradox reaffirms the need for a metaphor in interdisciplinary studies that can help us to bridge the gap between our competing views of interdisciplinarity.

PURPOSE STATEMENT

This discussion makes a case for a dialogic consideration of interdisciplinarity. As a form of dialogue, intertextuality signifies the anti-foundationalism that we associate with metaphors, language, and interdisciplinarity (Derrida, 1997; Farris, 2017; Leitch, 1986). It questions the objectivism that psychology and interdisciplinarity too often adopt or adapt for a scientific veneer (Graff, 2015; Klempe, 2018). I challenge the view that psychological or instrumental interpretations of interdisciplinarity can provide an adequate rationale for an integrative pedagogy in today's digital culture. Ironically, many scholars in interdisciplinary studies support rules and operational theories that inadvertently discipline the complexity and unpredictability that characterize interdisciplinarity as a form of heterogeneous and disruptive thought (see more on this point in Frodeman, 2014; Klein, 2001; Mackey, 2002; Welch, 2018). Not only are these rules and theories metaphors for modernism, but they call attention to the intracontradictions and divisions between those who support critical/conceptual interpretations of interdisciplinarity and those who support instrumental/methodological interpretations. As a consequence, the greatest challenge to interdisciplinarity's future may come from the ideological tensions within its ranks and not criticisms from the outside (Fish, 1989; Graff, 2015; Jacobs, 2013). A root metaphor grounded in an epistemology of texts can help us to bridge the gap in our ranks and the even wider gaps between the human, social, and natural sciences in academe.

To move us toward this goal, I first explain why Boix Mansilla's criteria for a pragmatic constructionist epistemology reproduce the problems that they try to solve with a modernist approach to psychology. Using Jacques Derrida's science of supplementation as a theoretical paradigm and a challenge to the authority of modernism and mainstream psychology, I synthesize the dialogic iterations of his concept in the theories of Julia Kristeva and Roland Barthes. This synthesis not only identifies *intertextuality* as an alternative epistemology for interdisciplinarity, but it also signifies "the matrix" as a trope for intertextuality. Next, I describe how intertextuality as a pedagogy is supported by postmodernism and activity theory. Activity theory is a growing tradition in psychology that integrates

instrumental and conceptual approaches to interdisciplinarity. Finally, I conclude by recommending the matrix as the metaphor best positioned to sustain this integration, thus helping us to develop a new discourse for interdisciplinarity that resonates across the disciplines.

A PRAGMATIC CONSTRUCTIONIST EPISTEMOLOGY

Boix Mansilla (2010) argues that a pragmatic constructionist view of interdisciplinary learning helps to explain the processes and practices in interdisciplinarity. Interdisciplinary learning is described as "a process by which individuals and groups integrate insights and modes of thinking from two or more disciplines or established fields, to advance their fundamental or practical understanding of a subject that stands beyond the scope of a single discipline" (p. 289). Four criteria are required in Boix Mansilla's epistemological framework for interdisciplinary learning. First, in order to account for the multiple forms of disciplinary perspectives, the framework must be pluralist. Second, the framework should be relevant to interdisciplinary learning. Third, the theory has to account for the dynamic movement of knowledge from "less to more accomplished instantiations." Last, the framework must provide a means for knowledge quality assurance and acceptable standards (p. 294). Boix Mansilla (2010) goes on to identify the four core cognitive processes or steps involved in this epistemological blueprint: "establishing purpose; weighing disciplinary insights; building leveraging integrations; and maintaining a critical stance" (p. 298). These processes interact as learning progresses, thus resulting in improved understanding or reflective equilibrium (pp. 299-300). In order to test the capacity of the framework, Boix Mansilla (2010) applies it in the context of two learning examples—one involving a historical monument and the other, the relationship between climate change and water availability.

After review, it appears that Boix Mansilla's theory supports the epistemological position that she wants to challenge. She evaluates how our epistemological assumptions often frame and shape our understanding of interdisciplinarity. Specifically, Boix Mansilla (2010) critiques the ways in which positivism limits our conceptualization of interdisciplinarity. She claims that positivism is reductive. It regards logic, science, and mathematics as sources of objectivity and truth (p. 293). Boix Mansilla (2010) concludes that a more pluralistic epistemological theory—pragmatic constructionism—is needed because it recognizes the multiple knowledge forms and activities that define interdisciplinarity (p. 294). However, some scholars might disagree. According to Frodeman (2014), the four core cognitive processes or steps used to support Boix Mansilla's pragmatic

constructionist paradigm are also positivist (pp. 43-49). Frodeman's critique is strengthened by the fact that Boix Mansilla (2010) uses what critics call *a modernist psychological approach* to support her position. Scholars in postmodern psychology such as Kvale (1992) and Holzman and Morss (2000) describe the important ways that the science of psychology is challenged and enriched by the introduction of postmodern perspectives in academic or mainstream psychology. How would a postmodern perspective enrich our understanding of interdisciplinarity? To answer this question, we need to examine the theoretical underpinnings that support Boix Mansilla's project.

When viewed through a postmodern lens, Boix Mansilla's theory may have more critics than advocates. What Boix Mansilla (2010) creates is a developmental theory of learning wrapped in a recipe for interdisciplinarity. Boix Mansilla's conceptualization of interdisciplinarity is what Klein (2001) calls "a modernist agenda in the midst of postmodern skepticism" (p. 44). Klein (2001) says methodical or process models of interdisciplinarity are common. While such models do have the potential to improve practices, they tend to be prescriptive (p. 51). This assessment also holds true for Boix Mansilla's theory. Ironically, Boix Mansilla (2010) turns to the philosophy of Nelson Goodman and Catherine Elgin to support her theory and to do a job that she probably suspects mainstream psychology cannot do alone, which is rationalize interdisciplinary learning based on cognitive processes (p. 295). In fact, postmodern critiques of psychology question whether psychology is capable of providing an adequate rationale for learning at all (Klempe, 2018, p. 384). According to Lyotard (1984), postmodernism is a reaction to modernism and the Enlightenment ideas on which it rests. Their grand narratives of progress based on reason and positivism failed to deliver what they promised. Lyotard (1984) defines postmodernism as the end of grand narratives of truth and the emergence of a deep suspicion of arguments that claim that rationality and science always lead to objectivity. In fact, truth is determined to be a form of discourse or text that is always unfinished, relational, constructed, and contextual (pp. 37-47). For many theorists, postmodernism describes the culture that represents this world view that Lyotard articulates. However, post-structuralism defines the intellectual movement and methods that we often associate with postmodern thought. It might be better understood as a critical approach that uses language and texts to disrupt all attempts to structure or freeze the multiplicity and heterogeneity that condition our notions of reality (Derrida, 1978, 1997).

In *Postmodernism and Education,* Usher and Edwards (1994) claim that educational theory and practice are founded on "the discourse of

modernity and its self-understandings have been forged by that discourse's basic and implicit assumptions" (p. 2). The authors claim that we need to reexamine our educational theories and practices from a postmodern perspective. Postmodernism is more than a body of pluralistic thought influenced by prolific theorists such as Jacques Derrida. It is a world view that informs practice. "In a sense," write Usher and Edwards (1994), "the postmodern perspective is a confrontation with epistemology and deeply embedded notions of foundations, disciplines, and scientificity" (p. 3). The discipline that Usher and Edwards (1994) evaluate using a postmodern viewpoint is psychology. They specifically focus on its relationship to disciplinary foundations and processes of legitimation in education (pp. 33-55). The authors argue that "psychology contains within itself a powerful tendency that uncritically supports the modernist grand narratives of progress through science, and, indeed, it is in this way that psychology readily becomes a powerful regulatory discourse" (p. 39). By adopting a scientific paradigm in psychology, we produce a modernist discourse that shapes our rationales, techniques, perceptions, attitudes, and academic structures (Holzman & Morss, 2000; Shotter, 1991). Like Boix Mansilla, many educators assume that psychology can describe the processes of the mind and make education appear more scientific. Usher and Edwards (1994) explain what causes us to invest in this belief when they claim that psychology "conditions its self-understanding to regard the natural sciences as the model and standard of scientific endeavor" (p. 39).

However, the authors conclude that psychology loses some of its critical force when it situates itself in a scientific paradigm. Psychology must expand its range of influences. Usher and Edwards (1994) argue that psychology's claim to scientific status is driven by the respectability and validation associated with the hard sciences. They go on to write, "It has needed to be seen as scientific since otherwise it would have had no warrant in a modernist scientific-technological culture" (p. 49). Usher and Edwards (1994) and Klempe (2018) would agree that pedagogy in the age of digitalization demands that psychology (re)consider a postmodern world that is characterized by complexity, hybridity, and continuous knowledge formations. With this perspective in mind, Usher and Edwards (1994) and Farris (2017) reveal the ways in which theorists such as Derrida also serve as postmodern pedagogues who can help us to discover an alternative epistemology that explains interdisciplinary learning. After examining Sigmund Freud's use of writing as a metaphor for describing cognitive processes, Derrida (1978) implies that the psyche is paralogical like writing (pp. 196-231). In fact, writing or *grammatology* is Derrida's master concept for dynamism and meaning-making. Not only does Derrida (1997) challenge

the positivism associated with modernism and mainstream psychology, but his theory of supplementarity provides us with a paradigm for understanding interdisciplinarity, metaphors, matrices, and the intertextual nature of epistemology (Usher & Edwards, 1994, pp. 119-135; Norris, 1987, pp. 65-68, pp.113-117).

DERRIDA AND SUPPLEMENTARITY

In *Of Grammatology,* Derrida (1997) cites C. S. Peirce (1955) as one of the first to describe the supplemental nature of sign systems in the process of communication. As a mathematician, scientist, philosopher, and semiotician, Peirce makes important contributions in several disciplines. He contributes to our contemporary understanding of the conceptual importance of language and mathematics as tools for communication and analysis. According to Parshall (1998), Peirce and his father are powerful influences on James Joseph Sylvester, the mathematician credited with defining the term *matrix* for its use in algebra. In his noted definition of a matrix, Sylvester (1904) writes, "I have in previous papers defined a 'Matrix' as a rectangular array of terms, out of which different systems of determinants may be engendered, as from the womb of a common parent; these cognate determinants being by no means isolated in their relations to one another, but subject to certain simple laws of mutual dependence and simultaneous deperition" (p. 247). Unlike Sylvester, Peirce has interests in many academic areas beyond matrices. He is particularly interested in semiotics. Peirce (as well as Ferdinand de Saussure) is considered one of the fathers of semiotics. Chandler (2002) explains how Peirce's model provides the foundation for semiotics from which structuralism and post-structuralism originate. More importantly, Peirce's conceptualization of the sign as dialogic creates the groundwork for what would later be called *intertextuality* (discussed below) (Chandler, 2002, p. 34). Peirce (1955) develops a three-part model of the sign that consists of representamen (form of the sign), interpretant (sense made of the sign), and object (that to which the sign refers). The interaction of these parts is what he calls *semiosis.* According to Peirce, signs participate in translation and they, like all thinking, are dialogic. He says, "We think only in signs. These mental signs are of mixed nature" (p. 115). Peirce recognizes the translation of signs as a paralogical process, but Derrida also sees it as a *science of supplementarity.*

According to Derrida (1997), the history of truth or *logocentrism* among Western philosophers, intellectuals, and educators has always involved a search for a transcendental signified, more specifically the privileging of the metaphysics of presence over absence and speech over

writing (p. 4). Derrida (1978) claims, “The history of metaphysics, like the history of the West, is the history of these metaphors and metonymies” (p. 279). As a consequence, these metaphors deeply influence the way that we come to rationalize our world in terms of differences, oppositions, and hierarchies. These structures help to control and “center” meaning. By focusing on language as a system of endless signification, Derrida (1978) uses *deconstruction* as a conceptual tool and activity for disrupting these structures. Deconstruction allows us to insert “alternative centers” or supplements so that we can realize new meanings and possibilities that have been hidden or marginalized. Derrida (1978) writes, “in the absence of a center of origin, everything became discourse—provided we can agree on this word—that is to say, a system in which the central signified, the original or transcendental signified, is never absolutely present outside a system of differences” (p. 280). In introducing Derrida’s philosophy (1997), Gayatri Spivak warns that deconstruction is perpetual and conflictual. It can “never be a positive science” (p. lxxxviii). Yet, Derrida argues that there is also a liberatory and pedagogical quality in deconstruction, as it helps us to overcome the disciplinary, theological, epistemological, and metaphysical obstacles that maintain and reproduce the status quo (Farris, 2017; Ulmer, 1985). Derrida insists that all knowledge is underwritten by writing. The interpretive nature of writing compromises anything that we think we may know or believe to be true. Henceforth, writing becomes the metaphor that Derrida uses to represent the structure of supplementarity. He concludes that “if supplementarity is a necessary indefinite process, writing is the supplement par excellence since it marks the point where the supplement proposes itself as supplement of supplement, sign of sign” (p. 281). As a form of writing, texts are figurations that are constantly on the move to the next signifying moment. There is nothing outside the text because everything is a text and all texts are always interrelated. Therefore, the text is the process and product of what we call knowledge (Derrida, 1997, p. 13; Leitch, 1986, p. 53). According to Norris (1987), “Writing, in short, is intertextual through and through” (p. 26).

In using supplementarity as a theoretical frame for explication and analysis, it is important to remember that the term *supplement* operates under two definitions. For Derrida (1997), supplement is both a “substitute” and an “addition” (pp. 144-145). Another fascinating way that he plays on these definitions of supplementarity is through algebra (p. 167). He turns to algebra for its metaphorical and explanatory value in the same way that his predecessors did. Derrida draws attention to the fact that early philosophers such as Leibniz saw reasoning and calculating as the same process, and algebra was synonymous with analysis. Leibniz is quoted as saying, “‘What

we call Algebra, or Analysis, is only a small branch, for it is this science that gives speech to language, letters to speech, numbers to arithmetic, notes to music; it teaches us the secret of stabilizing reasoning'" (cited in Derrida, 1997, p. 78). According to Plotnitsky (2003), algebra is defined by written symbolism, and this symbolism, whether realized in material form or not, represents a form of writing with universal characteristics that Leibniz and Derrida view as a type of philosophical algebra. The operations in algebra, particularly in a matrix, enact the logic of supplementarity. Derrida (1997) argues, "The supplement is always the supplement of a supplement. One wishes to go back from the supplement to the source: one must recognize that there is a supplement at the source. Thus, it is always already algebraic" (p. 304). Like the term *supplement, algebra* has a double meaning for Derrida. It represents an instrument for the technical analysis of various relations between elements, and it represents a philosophy of plurality, difference, and undecidability. The conceptual richness in language and mathematics gives them a philosophical common ground on which they create metaphorical reciprocity. Plotnitsky (2003) writes, "I see 'algebra' as a trope, perhaps the ultimate trope, or concept of formalisation, whether we think of formalizing systems (such as those of mathematics or, via mathematics, physics or other sciences), systems of concepts in logic and philosophy, or language, as in linguistics" (p. 99). Ultimately, the intersection between mathematics and Bakhtinian dialogism allows Julia Kristeva as well as Roland Barthes to blur the lines between structuralism and post-structuralism and appropriate *supplementarity* as *intertextuality.*

KRISTEVA, BARTHES, AND INTERTEXTUALITY

Intertextuality as a concept has a long history in Western thought. In order to help us to navigate the panorama of intertextuality, Worton and Still (1990) distinguish between the enactors of intertextuality and its theorists. The theorist at the center of contemporary notions of the concept is the Russian language philosopher Mikhail Bakhtin. In his complex theory of dialogue, Bakhtin (1986) imagines connections between different people, languages, texts, disciplines, and all differences. In essence, Bakhtin's philosophy of language or dialogism is a meditation on creativity and the interrelations between parts and wholes as well as sameness and difference. The central tenant in dialogism is that meaning is everywhere and in everything. Meaning is constantly being created and recreated through words and language. Bakhtin asserts that the word in language is shared and its processes are always dialogic, creative, and unfinalized. Bakhtin (1990) tells us that we can never know "the technical aspects of creation and

craftsmanship." He writes, "The actual work of creation is experienced, but this experiencing neither leaves nor sees itself" (p. 7). In notes from his later years as a scholar, Bakhtin (1986) makes this assessment about dialogic relations: "These relations are profoundly unique and cannot be reduced to logical, linguistic, psychological, mechanical, or any other natural relations" (p. 124). In dialogism, "each word (each sign) of the text exceeds its boundaries. Any understanding is a correlation of a given text with other texts" (p. 161).

After Bakhtin, Worton and Still agree that Julia Kristeva is the most influential figure in the development of intertextuality as an epistemological concept. Worton and Still (1990) write, "One of the most important, and earliest, interpretations of Bakhtin's work for a western public was by Kristeva" (p. 16). Other theories of intertextuality are mostly indebted to Kristeva's innovation via Bakhtin (see Alfaro's [1996] review of theorists such as Todorov, Culler, Genette, and Riffaterre, who contribute to our understanding of intertextuality). However, Derrida plays an important role in Kristeva's conceptualization of intertextuality. He actually mediates Kristeva's reading of Bakhtin. Alfaro (1996) claims that Derrida provides Kristeva with a view of texts that she does not derive from Bakhtin, and that is the dimension of supplementation. In fact, Alfaro (1996) would agree that the Derridean view of texts as supplementation is "crucial" to our understanding of intertextuality (p. 276).

Like Derrida, Kristeva provides us with more than one interpretation of intertextuality. In her appropriation of Bakhtin, Kristeva (1986) evokes the mathematical applications for which she is famous, then she inserts the word *"text"* into Bakhtin's quote in order to describe textual interrelations. Kristeva (1986) claims that the *"word"* maintains a special status along a horizontal axis (subject-addressee) and a vertical axis (text-context). When the two coincide, they reveal how "each word (text) is an intersection of word (text) where at least one other word (text) can be read" (p. 37). She goes on to use dialogism to argue that "any text is constructed as a mosaic of quotations; any text is the absorption and transformation of another" (p. 37). This transformation of texts creates a foundation for Kristeva's *semiotics.* It is the term that she (re)appropriates to describe the forces at play in language and to transform the subject in her critique of the *psychoanalytics* of Sigmund Freud and Jacques Lacan. Kristeva (1984) designates the terms *symbolic* and *semiotic* to characterize her semiotic process, which in many ways extends Derridean thought. The symbolic relies on a fixed meaning or structure for its signifying power and is analogous to modernism. The semiotic is the opposite of the symbolic and usually experiences the weight of its repression as a consequence. It

underpins postmodernism. For example, the semiotic relies on the heterogeneity in meaning and its capacity to disrupt all hierarchies and oppositions (Kristeva, 1984, pp. 24-25; Payne, 1993). The semiotic is always threatening to change the symbolic. Kristeva (1984) says, "what remodels the symbolic is always the influx of the semiotic" (p. 62). Kristeva's claim that (narrative) texts constitute a "dialogical matrix" is a reminder of her work's indebtedness to structuralism, Bakhtin, and Derrida. The combination of these elements helps her to express one of the earliest articulations of post-structuralism (1986, pp. 34, 46).

In *Revolution in Poetic Language,* Kristeva (1984) explores Bakhtinian and Derridean logic even further. Kristeva's conceptualization of intertextuality gets rebranded as *transposition.* She explains why she abandons the term that she coined. Kristeva (1984) writes, "The term *inter-textuality* denotes this transposition of one (or several) sign system(s) into another; but since this term has often been understood in the banal sense of 'study of sources,' we prefer the term *transposition* because it specifies that the passage from one signifying system to another demands a new articulation of the thetic—of enunciative and denotative positionality" (pp. 59-60). For the most part, the term changes but the general spirit of Kristeva's original conceptualization is basically the same. What must not get lost in Kristeva's revision is her articulation of the pedagogical implications of textual interrelations. The text is representative of the process of intertextuality and its product—the text. Like Bernstein (1990), Kristeva claims that the text is pedagogical, social, and transformational. In other words, the creator of texts is always already reading and writing a new text for others to read and write. Kristeva (1984) says, "In calling the text a practice we must not forget that it is a new practice, radically different from the mechanistic practice of a null and void, atomistic subject who refuses to acknowledge that he is a subject of language" (p. 210).

However, some will ignore Kristeva's advice and continue to see her theoretical achievement as more problematic than promising. Critics often accuse Kristeva of having conflicting applications of intertextuality in her work and a crypto-allegiance to formalism. Kristeva is also accused of (mis)appropriating Bakhtin's ideas and radicalizing them (Alfaro, 1996; Orr, 2003; Payne, 1993). These concerns often cause many of Kristeva's critics to use other definitions of intertextuality, particularly those expressed by her mentor, Roland Barthes. According to Orr (2003), Barthes introduces a definition of intertextuality that not only competes with Kristeva's but grafts from it and sometimes overshadows it (pp. 32-36). Barthes (1989) defines the text as an activity or a form of production where author and reader come together. Texts are continuously producing or "working." A text does not

stop because the process of language knows no cessation and meaning is always becoming (pp. 57-59). Barthes says, "The metaphor of the Text is that of the network" (p. 61). Moran (2010) claims that it is Barthes's appropriation of (cultural) texts that allows him to present a model of interdisciplinarity that reveals how various disciplines can be brought together around texts. More importantly, Barthes recognizes a connection between intertextuality and interdisciplinarity that suggests that the two are symbiotic and figurative equivalents in postmodernism (also see Orr, 2003, pp. 44-48). Barthes (1989) argues, "In order to do interdisciplinary work, it is not enough to take a 'subject' (a theme) and to arrange two or three sciences around it. Interdisciplinary study consists in creating a new object, which belongs to no one. The Text is, I believe, one such object" (p. 72).

Furthermore, Barthes shows us that the connection between intertextuality and interdisciplinary applies not only in post-structuralism but also in structuralism, which is heavily influenced by modernism and mathematics (p. 59). Arguably, one could say that interdisciplinarity and intertextuality live on a continuum for Barthes (1989). This may explain why "the claim to interdisciplinarity is often made on the ground of intertextuality," according to Klein (1996, p. 131). Moran (2010) argues that "Structuralism is interdisciplinary because all kinds of artefacts and phenomena can be interpreted as 'texts': for Barthes, a text is simply a vehicle for the production and dissemination of cultural meaning" (p. 77). Using a structuralist's approach (that he later replaces with a post-structuralist one), Barthes (1990) tests the potential and limit of textual signification and plurality in what he calls "a signifying matrix." Barthes (1990) concludes that the matrix is useful as both a model and metaphor (pp. 59-70). Klein (1996) agrees when she argues, "Matrix structure is another older form of hybrid community. 'Matrix' is both structure and metaphor. The word denotes something that gives form or origin" (p. 23). As a heuristic, the matrix may prove to be a useful tool in helping us to negotiate the various pedagogical approaches and methods available for teaching interdisciplinarity.

ACTIVITY THEORY AND PEDAGOGY

DeZure (2010), Haynes, (2002), Klein, (2002), and Lattuca (2001) all agree that there is no unique pedagogy, strategy, technique, or formula for teaching interdisciplinarity. Haynes (2002) claims that interdisciplinarity requires the use of a host of "powerful pedagogies" and simply cannot be taught with one approach. Klein (2002) says, "Interdisciplinary pedagogy is active, dynamic, and process-oriented. Application of knowledge takes

precedence over acquisition alone, accentuating development of skills of analysis and critical thinking" (p. 13). Newell (2001, 2013) outlines one of the most influential paradigms for practicing interdisciplinarity in the United States. Szostak (2002) and Repko and Szostak (2017) build on the theoretical foundation and best practices that Newell's work provides (Newell & Arvidson, 2018). According to DeZure (2010), technology has made it easier for us to collaborate and access methods and models that can help us to improve interdisciplinary instruction, but more work still needs to be done to fulfill their promise and potential (pp. 375-381).

To assist us, Bernauer and Tomei (2015) have developed the Integrated Readiness Matrix as a way to help academics reflect on their pedagogical philosophies, practices, and shortcomings. According to Bernauer and Tomei (2015), the Integrated Readiness Matrix is a "tool for identifying faculty skills and competencies along two critical dimensions of teaching: pedagogy and technology" (p. 55). This resource characterizes key pedagogical and technological theories, and it identifies some of the practices and frameworks that educators need in order to produce effective learning activities, better assessment strategies, and more competent students. Bernauer and Tomei (2015) insist that faculty must see pedagogy as more than the "art, science, and profession of teaching" (p. 3). Pedagogy is also defined by interdisciplinary relationships or what Bernauer and Tomei (2015) call the "pillars of teaching and learning." The pillars are philosophy, psychology, sociology, history, and leadership (pp. 3-4). Together, these disciplines create the kinds of dialogues that inform our pedagogical choices. According to Bernauer and Tomei (2015), we must go beyond the personalization of pedagogy in order to better integrate our perspectives and meet the learning needs of an increasingly diverse student population.

The theorist and pedagogue Paulo Freire illustrates what intertextuality looks like as an integrative practice or what is commonly called *dialogic pedagogy*. Freire (1990b) claims that since the dialogic process brings together theory and practice, dialogue must not be "reduced to the act of one person's 'depositing' ideas in another, nor can it become a simple exchange of ideas to be 'consumed' by the discussants" (p. 77). A pedagogy rooted in dialogue allows for the emergence and re-invention of knowledge and the development of consciousness, the awakening of critical awareness that grows out of critical learning environments that lead to the transformation of self and society. To demonstrate his point, Freire (1990a) uses a matrix as a tool for practicing intertextuality and fostering changes in student behavior and consciousness. He combines the following strategies and activities: a dialogic matrix, revised content, interdisciplinary teams,

thematic breakdowns, and codification. He says that when the words in a horizontal relationship or dialogic matrix are linked, participants can "join in a critical search for something new" (p. 45). Anti-dialogic matrices involve "vertical relationships between persons…. It is self-sufficient and hopelessly arrogant" (p. 46). Anti-dialogic practices lead to what Freire famously calls *the banking concept of education.* Freire (1990b) says, "In the banking concept of education, knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing" (p. 58). Education becomes a transaction between depositors and depositories.

Rule (2011) claims that a dialogic pedagogy is the exact opposite of the banking concept of education. Rule studies the relationship between Bakhtin's and Freire's theories of dialogue and concludes that there are commonalities in their perspectives. In creating a dialogue between the work of the two theorists, Rule (2011) discovers that they both recognized the open-endedness and unfinalizability of dialogue. Using dialogue as a grounding principle, Rule (2006) writes, "A poetics of dialogic pedagogy thus explores the creative tensions between constitutive elements such as learner and educator, formal and informal, programme and institution, university and community, seeing these are relations rather than polarities" (p. 80). However, Graff (2003) explains why conflicts, disagreements, and a wider range of outcomes may be a more logical expectation for a pedagogy based on dialogue. Graff (2003) famously advocates "teaching the conflicts" and Lattuca (2001) identifies others who agree (pp. 149-153). What Graff (2003) means by his phrase is that philosophical, social, and disciplinary conflicts are teaching opportunities that should be at the center of the academic curriculum. He says, "if disagreements over what should be taught and how are inevitable, the sensible course would be to quit trying to hide these disagreements and start making productive use of them in classrooms" (p. 12). Graff (2003) claims that "teaching the conflicts can be done in any discipline or subject area" (p. 12). More importantly, teaching the conflicts is a way to clarify academic culture and make the differences between disciplines more coherent for students. Evading conflicts obscures rather than transforms the life of the mind for students. Graff (2003) describes thinking as a dialogical process that depends on the contrasts that conflict provides. However, the academic curriculum too often does not reflect this approach (p. 13). Gadotti (1996) agrees. He claims that dialogic pedagogy has contributed to our contemporary understanding of learning and school systems. However, the pedagogy of conflict stands in its shadow. Echoing Derrida, Gadotti (1996) writes, "Conflict is a category I continue to claim as essential to all pedagogy. The role of the educator is to educate. Educating

presupposes a transformation, and there is no kind of peaceful transformation. There is always conflict and rupture with something, with, for instance, prejudices, habits, types of behaviors, and the like" (p. xvi). For Gadotti, all pedagogy refers to practice. It is performative. Pedagogy is action, and learning theory should reflect this important feature (1996, p. 7).

In activity theory, action is recognized as an essential part of the learning process. Activity theory supports a pedagogy that focuses on dialogic practices, and it serves as an example of the direction in which Holzman and Morss (2000), Shotter (1991, 1993), and Usher and Edwards (1994) suggest that psychology can expand beyond scientism (pp. 49-50). Wertsch (1981) identifies the major features of activity theory. In the theory, activities are evaluated from various levels and viewpoints. They are goal-directed and mediated. Activities are analyzed in terms of their developmental significance and their social processes. If we are to comprehend the assumptions and ramifications of activity theory today, we must recognize how it is influenced by the iconic psychologist Lev Vygotsky (Wertsch, 1981, p. 17). A contemporary of Mikhail Bakhtin and a noted critic of scientism in psychology, Vygotsky (1962) reminds us of the powerful role that semiotics play in our understanding of cognitive development and he anticipates the postmodern approach in psychology (Klempe, 2018). Vygotsky (1962) argues that a word is a "microcosm of human consciousness" and a psychological tool for continuous learning (p. 153). Vygotsky (1962) describes the relationship between words and thoughts as an intertextual process rather than a linear procedure. He says this process is a "continual movement back and forth from thought to word and from word to thought" (p. 125). The changes that occur are regarded as evidence of development. Vygotsky (1962) writes, "Thought is not merely expressed in words; it comes into existence through them. Every thought tends to connect something with something else, to establish a relationship between things. Every thought moves, grows, and develops, fulfills a function, solves a problem" (p. 125).

It is in activity theory that we see cognition and communication brought together by the integrative power of language and dialogue. Russell (1995) reveals the ways in which this connection can also inform our understanding of the symbiosis between interdisciplinarity and intertextuality. As a functional system, activity theory involves the following interactive components and not steps: "subject (a person or persons), and object(ive)(an objective or goal or common task), and tools (including signs) that mediate the interaction"(p. 53). Arguably, there are five important constituents involved in this system. Russell (1995) says, "Activity systems are historically developed, mediated by tools, dialectically

structured, analyzed as the relations of participants and tools, and changed through zones of proximal development"(p. 54). Mediational tools are interdisciplinary and metaphorical. They include actual tools, computers, speaking, reading, writing, music, architecture, and physical activities (p. 54). In the postmodern sense, mediational tools are equivalent to texts and they signify integration as an important feature in culture and activity theory. Russell (1995) reminds us that "texts are tools for carrying out some activity and they vary with the activity, just as hammers vary in their design and use depending on the work to be done using them"(p. 54). He goes on to write, "For those tools that are in the form of texts, meanings almost always arise in relation to previous texts (intertextuality) as well as relation to nontextual phenomena"(p. 55). Ultimately, activity theory characterizes learning as situated, pragmatic, intertextual, disciplinary, and interdisciplinary. In activity theory, the two modes of interdisciplinarity integrate rather than compete. Activity theory serves as an example of the continuum that Szostak (2015) conceptualizes and recommends. In his evaluation of interdisciplinarity, Szostak (2015) concludes that there is a symbiotic relationship between conceptual and instrumental interdisciplinarity. He confirms that we can begin to "cope with the seeming dichotomies" by defining the continuum between them (p. 103). Activity theory fulfills this role. Lastly, activity theory suggests that our conceptualization of learning may need to be redefined as the continuous change in human consciousness and performance due to interdisciplinary and interactive experiences with language and a changing world (Driscoll, 2000).

CONCLUSION

As a noted interdisciplinarian and systems theorist, Bateson (1979) has argued that "there is no existing science whose special interest is the combining of pieces of information" (p. 21). This may be true. However, this discussion reveals that we do have a metaphor in the *matrix.* It could prove to be just as beneficial as science in helping us to understand and negotiate complexity. Bateson (1979) appears to agree when he says, "What has to be investigated and described is a vast network or matrix of interlocking message material and abstract tautologies, premises, and exemplifications"(p. 20). This discussion not only describes an alternative epistemology for interdisciplinary learning based on a network of texts and activity theory, but it also outlines the ways that the matrix—as a paradigm, permeates postmodern theory and pedagogy. We also discover that the matrix represents a network of heterogeneous relations where the parts always relate to the whole. It symbolizes the unity of process and product,

reading and writing, and theory and practice. The matrix is the praxis and paralogic at the center of postmodern education.

More importantly, it is also inherently interdisciplinary. The matrix is one of the few terms that resonates across the human, social, and natural sciences. Most standard dictionaries will list the many meanings and disciplines associated with the word *matrix.* There are very few terms that rival its reoccurrence across academe. It serves as a metaphor that can help us to understand the future of teaching and learning, as it evokes the hypertextuality and connectivism that are now the hallmarks of online education. In their influential study of metaphor, Lakoff and Johnson (1980) remind us that metaphors are more than just words. They represent thought and action in conceptual systems. Conceptual systems are fundamentally metaphorical and so are our various formulations of cognitive processes (pp. 3-6). As the actualization of activity theory, matrix thinking brings these processes together as two aspects of the same phenomenon. Ultimately, the matrix is the trope that signifies the vast epistemological, biological, ecological, and digital network on which everything in existence can be framed and explored. As a symbol of Vygotsky's "web of meaning," the matrix is the kind of root metaphor that we need in interdisciplinary studies and higher education. We can only hope that its symbolic power will inspire new academic conversations about the role of psychology and disciplinarity in a world that is increasingly hyperinteractive and unapologetically interdisciplinary.

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Exploring Faculty and Student Reflections on Collaborative Teaching in the Honors Seminar Classroom

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ABSTRACT

University Honors programming in the United States is interdisciplinary and collaborative; from First Year Seminars to capstone research projects for upperclassmen, students embrace multidisciplinary learning and research. This approach, however, does not always translate into an incorporation of diverse perspectives of multiple faculty members in a given course. Utilizing a mixed-methods approach to explore the impact and results of a collaboratively taught Honors Seminar, this article departs from the authors' model of a co-taught course and then moves to an exploration of student responses that considers student perceptions of multi-instructor formats. In closing, this article addresses challenges to team-taught courses, from scheduling to institutional barriers, in an effort to encourage continued discussion about interdisciplinary and collaborative teaching in Higher Education.

Keywords: collaborative teaching, team teaching, interdisciplinary coursework, Honors programming

INTRODUCTION

Honors Seminars, allowing for meaningful and interdisciplinary intellectual exchanges in a small-group setting, are often integral components of Honors programming in the United States. A growing body of research focuses on this multi-disciplinary learning platform that can include First Year Seminars as well as Honors Seminars. The majority of existing studies, however, approach such courses as faculty-led research seminars with just one instructor. This article suggests that beyond the coursework itself being geared toward an interdisciplinary framework, Honors Seminars – and the students enrolled in these courses – also benefit from a multiple instructor model. The pages to follow highlight the value of collaborative teaching in the context of Honors Seminars. A critical approach to multi-instructor Honors Seminars capitalizes on the capstone research experience of many Honors programs; such Honors projects are traditionally collaborative in nature and encourage students to conduct cross-disciplinary work on a research team that is interdepartmental. Recognizing that interdisciplinary learning is a natural outcome of positioning multiple experts in the role of instructor, this paper analyzes student feedback to confirm the value(s) of team teaching in the Honors Classroom. We also address challenges in regards to planning and scheduling co-taught Honors courses and offer our own experiences to further comment on managing and negotiating teaching responsibilities. As a point of clarification, we use numerous terms synonymously to refer to the act of two or more instructors, ideally from varying disciplines, working together on a teaching team. The terms used in this article range from collaborative, co-taught, team-taught, to multi-instructor teaching or coursework.

While the paragraphs to follow discuss Honors Seminars and the existing literature approaching the multi-instructor design of such courses, we then move to offering a model for collaborative teaching in an Honors Seminar at a large, Midwestern, public institution. We give a brief outline of the Honors Program where we taught the collaborative Honors Seminar that is the focus of the present article and analyze the results of a pre- and post-test gauging the experience of students in the course. While the sample size is small – only 16 students were enrolled in the seminar – considering a subculture of Honors students and their anonymous responses to the course facilitates discussion on whether the experience of a team-taught Honors Seminar was positive (for both faculty and students alike).

Our aim is to further existing discussions as related to team teaching, endeavoring to move beyond the single instructor model in an effort to

embody and practice the values of Honors programs on a national scale. Team teaching is an established practice within Honors programming and the present article looks more closely at student responses to this collaborative approach while also addressing the experience of the faculty involved. In the penultimate section of the article, and perhaps most importantly, we include the results of the aforementioned pre- and post-test in which students enrolled in our one-credit seminar responded to prompts about the benefits of co-instructed courses and diverse perspectives in collegiate learning environments. In addition to the presentation and discussion of the survey results, we also discuss how we managed the team teaching experience, in particular during the pre-teaching phase. We acknowledge the challenges and limitations to co-teaching Honors Seminars, many of which are structural and relate to scheduling issues, thus signaling the need for continued research on the topic of collaborative teaching models in the Honors classroom.

LITERATURE REVIEW

What makes most Honors programs unique is their ability to pull together faculty from many disciplines and areas of an institution, connecting university-wide experts in order to teach and mentor students across majors and colleges. Students who participate in Honors programs do so from all corners of the university. They share an interest in and curiosity about research and a commitment to exploring topics beyond the coursework of their major and/or minor curriculum(s). This highly interdisciplinary approach to learning has long been a pillar of the Honors mission and vision, presenting both a unique learning opportunity for students and challenges to those facilitating Honors coursework. The following literature review is focused on bringing to light some overarching themes present in the body of work dedicated to Honors programs as well as collaborative teaching models. It is not intended to be exhaustive, but rather to help inform readers of the gaps noted in the existing literature on these two areas as they inform our own work in this field.

Research points to the highly multidisciplinary and interdisciplinary mission of Honors programs across the nation (Newell & Thompson Klein, 1996; Black, 2011; Shane, 2019). Black (2011) highlights how her program at Northwestern College in Minnesota endeavors to live up to this ideal, defining multidisciplinary as encouraging the engagement with and informed understanding of multiple disciplines such as “music, art, mathematics, and science,” resulting in more “well-rounded scholars” (p. 197). Black writes that admission to the Honors program at her institution means that students are committing to learning about multiple disciples and being “interested in

everything" (p. 197). For Black's Honors program, the goal is to create well-rounded and curious scholars who are not isolated within their majors:

> Finally, we wanted the honors program to be a vehicle for associating, connecting, and integrating concepts and knowledge from a variety of disciplines. As an overriding focus, we strive through the multidisciplinary structure to help our students see associations that connect one discipline to another. (p. 197)

Black frames her argument around a key question that relates to implementation: What does it look like for a program or course to be multidisciplinary and collaborative? There is not a large body of research addressing how the established value of multidisciplinary teaching and programmatic implementation translates into practice, but there is indeed recognition of the importance of posing these questions and expanding the literature around issues in higher education specific to Honors programs.

Walsh-Dilley (2016) explores the state of research on and about Honors programs and emphasizes the need for more research and data focused *on* Honors programs in contrast to coming *from* Honors students and faculty to better inform best practices in the field. She argues that we have a scarcity of research focused on Honors programs specifically and that filling this gap would not only allow programs to demonstrate their value to students and administrators but would also help answer some crucial questions related to Honors programming. One such question that our study also grapples with considers how we best implement the mission and vision of Honors programs in the courses offered to students. Walsh-Dilley calls for research that is both "longitudinal and comparative" as well as befitting the "style of scholarship to which we are committed: interdisciplinary, integrative, and community-engaged as well as inclusive of and empowering to students" (p. 32). In other words, the research on and about Honors needs to mirror the values of Honors programs in being collaborative, interdisciplinary, and committed to engaging multiple perspectives, voices, and disciplines. While there is a body of work dedicated to better understanding the first year Honors experience and Honors orientation courses (Zee et al., 2016), additional research on Honors seminars is needed.

A noticeable trend in the existing scholarship on Honors programs and coursework explores how Honors courses are ideally suited to exploring issues of human rights, global issues, and equity and social justice (Szasz, 2017). Some of the reasons for this include smaller class sizes, lower student to faculty ratios, and discussion-based seminars that allow for deeper engagement with complex topics. Since Honors Seminars often draw on the

expertise of faculty from many areas of an institution, students have the opportunity to engage with and learn from experts in multiple fields. In the present article, not only do we emphasize the importance of bringing multiple perspectives from faculty from all fields and disciplines to the Honors curriculum, but we also argue for the importance of providing multiple perspectives on complex topics within a single seminar.

Similarly, Abes (2009) highlights the importance of bringing multiple theoretical perspectives into a classroom, suggesting that applying a single methodology or theoretical framework to research and data is insufficient and limited. For instance, Abes points to methodological approaches that center a heteronormative experience and erase the lived experiences of trans, queer, and gender non-conform bodies. Abes argues that by reading data through only one lens that does not give voice to different perspectives and experiences, researchers are perpetuating the erasure of some of our students' identities by not bringing in additional theoretical models (such as feminist or queer theories) that highlight other ways to make meaning. While Abes' argument focuses on the ways we teach our students to critically apply analytical frameworks in research settings, there is a direct link from Abes' argument to the present argument. Both respond to how we teach our students to engage from a multitude of perspectives and how diverse lenses shape their academic experience; identity development is not limited to research settings but includes daily discussions in the classroom. In short, a seminar taught by multiple instructors allows students to explore a topic from multiple perspectives in a way that a single-instructor model often does not.

The existing body of work that looks at multiple instructor models and collaborative teaching is more extensive at the K-12 level, where general subject teachers often collaborate with subject teachers (art, music, world languages) and special education teachers to deliver classroom instruction. At the university level, fewer studies exist that explore collaborative teaching models and offer examples of best practices and successes (Letterman & Dugan, 2004; Clark & Zubizarreta, 2008; Schray, 2008; Ford & Gray, 2011). In particular, Ford & Gray (2011) provide a framework of five distinct team teaching models for college and university level instructors that account for concerns such as teaching at an overload, "donating" one's time to teach when only one instructor can be the instructor of record for the class, managing who receives pay for the course, and other such issues that may not have the same need for consideration at the K-12 level (p. 104).

Kluth & Straut (2013) similarly offer university instructors a starting point for thinking through different types of team teaching options, breaking options into three possible models which they term "parallel teaching," "station teaching," and "one teach/one assist" (p. 231-233). For parallel

teaching, instructors divide the class into smaller sections and deliver the course in tandem to smaller subsets of students, thus creating a smaller teacher to student ratio. For station teaching, instructors create subsections of a course and deliver different content to each "station" based on learning goals and objectives. As with parallel teaching, station teaching takes place in the same classroom space with two or more instructors present. Finally, for the one teach/one assist model, one instructor delivers the lesson plan while a second instructor plays the role of assistant and moves around the room aiding students as they take in the class content.

Both Ford & Gray (2011) and Kluth & Straut (2013) offer useful studies in thinking through the different types of team teaching scenarios and the actual practice of dividing both the labor and benefits of teaching with one or more colleague(s). Their work demonstrates how team teaching and the co-taught classroom could take on many iterations and does not need to fit into one particular model or example. Ideally, the team-taught course accounts for each instructor's strengths and experiences, availability, and desired teaching objectives and thus arrives at a model that pulls together the best of each instructor's skills and strengths while creating an optimal learning environment for students. We argue that team teaching models, moreover, can also allow less experienced instructors to benefit from the exposure to more experienced instructors in a way that feels collaborative and student-focused. In such cases, the emphasis is not on evaluating a newer colleague but on working together to offer an ideal educational experience for students that at the same time benefits the more junior faculty member as well.

Our article builds on the identified need for increased research on Honors Seminars beyond the first year experience and calls for further exploration of collaborative teaching by providing one model of how an Honors Seminar on Global Borders was team-taught at a large research institution in the Midwest. In the following sections, we present a model that we created for our Honors Program and offer insights on the student learning experience derived from a pre- and post-course assessment.

RESEARCH METHOD

The large research university in the Midwest where we co-taught our course along with a third colleague has a long-standing Honors Program, created in 1960. Like many Honors Programs, some of the founding elements of the program at our university include a First Year Seminar for freshmen, capstone Honors research projects, and optional Honors housing. Our focus in the present article is not on the these first-year oriented or research-based opportunities, but instead on the one- to two-credit Honors Seminars. These

special topic courses are available only to students enrolled in the Honors Program and generally cap at 17 students. Honors students are required to take at least two seminars to graduate, and this number can vary depending on the College in which the student is enrolled.

The diverse topics of these Honors Seminars builds on and accentuates the informal, small-group setting of the courses. Seminars can be organized topically or thematically and offerings each semester are extremely varied. There are courses on data and analytics, finance, chemistry, architecture, mythology, sexuality, music, conflict studies, language, and countless other topics. While some seminars speak to a discipline-specific student audience, given a more focused as opposed to generalist course description, the majority of the seminars do the exact opposite. Thus, business seminars are geared toward non-business or economics majors, humanities seminars might be intended primarily for students in STEM fields, and so forth. The goal is to introduce students to a variety of areas outside of their chosen major and discipline.

Our Honors Seminar on Global Borders offered a thematic-approach and covered both physical borders as well as metaphorical ones. Our course took advantage of the small-group setting and each weekly meeting followed a discussion format as opposed to a lecture-based model. This discussion platform proved ideal for a co-taught seminar given the fact it put less pressure on the three instructors to coordinate or align lectures and allowed the students instead to direct the dialogue during our meetings. Each class centered on a specific border – either metaphorical or geopolitical – and began with a student-led presentation on the topic and ended with an instructor summary of the topic (aimed at filling in any gaps or clarifying discrepancies). The three instructors teaching our Global Borders course included an Assistant Professor, a Senior Lecturer, and a Lecturer with academic advising responsibilities; each instructor represented a different discipline and brought diverse experiences to the course. Our collaborative team took advantage of the fact that instructing an Honors Seminar at our institution is open to both tenure and non-tenure eligible faculty as well as to professional staff and graduate students with teaching experience. The following section offers a closer look at each instructor's profile and area of expertise followed by a breakdown of how we divided our workload, structured the planning, and negotiated concerns related to team teaching a course.

Planning for success: managing the team-teaching experience

Our overlapping interests in the themes of borders, migration, nation building, and personal identity development brought the three of us together

to plan a team-taught course. One instructor identifies broadly as a Caribbeanist with specific research interests in the Haitian-Dominican border region as well as Latinx migrant populations in the Midwest. Another instructor is a lecturer of French and Arabic with a research interest in the Middle East and maritime borders. The third and final instructor is a researcher of gender and culture within a Western European context (Germany, Austria, and France). Two of the instructors have a personal connection to the topic of borders and migration as they both emigrated from their native countries at a young age. Additionally, all of the instructors connected over a shared interest in the migratory history of the Midwest. Following multiple conversations over a period of several semesters on these overlapping and intersecting topics, the three instructors decided to create a course that would build on the expertise and experience of each individual faculty member to enrich the course content with the intent of highlighting to students the interconnectedness of borders, nations, and (personal and collective) histories.

An additional consideration in creating a team-taught course that would bring together all of our diverse cultural perspectives related to our desire to offer a model for how colleagues in our department could bridge individual expertise or research interests to achieve exciting cross-disciplinary learning opportunities for students. The three instructors are housed in a multi-section world languages department that includes several language and culture sections under a shared departmental model. While we all share a physical space in our building on campus and convene for monthly department meetings, we rarely collaborate on teaching and research projects with colleagues outside of our language and/or culture section. Collaborations in the classroom setting, if any, take place most frequently between colleagues in the same section or with faculty members of outside departments and disciplines on campus. We were interested in exploring a partnership that takes advantage of the obvious and exciting ways in which our research as humanists and cultural studies scholars overlaps while also gaining from the insights and perspectives each one of us brings to the conversation to compliment the knowledge of the others on our team. As such, we shifted our casual conversations about borders and migration to official planning meetings the semester prior to proposing our course.

Planning for a course begins months, and sometimes years, before the course appears on the university schedule of classes and is taught for the first time. Our Honors Seminar, too, required us to submit a course proposal 1-2 semesters prior to the desired semester of the course offering. These pre-teaching meetings, even in the early phase of course proposal, allowed the team of three to connect, both on a personal and professional level, and clearly

frame the guiding theme of our course and each of our unique contributions to the seminar topic. After discussing and agreeing on the theme of our seminar, global borders, and also the theoretical background for our pedagogy – building on interdisciplinarity and collaboration – we then moved to finalizing the syllabus and dividing the workload in terms of teaching assignments. In these initial meetings, we decided that it would be most beneficial to us and our students to rotate between classes (each only fifty minutes in length) and solo teach each individual class with the exception of three joint sessions (classes during which all instructors would be present) at the beginning, middle, and end of the semester. This meant that we distributed the course content and structured the syllabus thematically based on which instructor would be present each week. We opted for this model as a way to disrupt the notion that geopolitical borders function in separation from one another and to demonstrate how borders are fluid, interconnected, and informed by other borders whether they be located in Europe, the Middle East, or Latin America.

Given the fact the Honors Seminars at our institution are one credit courses that meet only once per week for fifty minutes and are intended to be discussion based, we did not need to spend extensive time aligning our classroom approaches or teaching methodologies. Instead, we decided student presentations, weekly instructor-prepared discussion questions, and brief lectures from instructors would guide each class meeting. We also used these brief pre-teaching meetings to discuss and divide the instructor workload leading up to our team-teaching semester. One instructor finalized the syllabus and submitted the course proposal, another designed our course flyer to help recruit students, and the third coordinated a guided campus art tour in partnership with the University Museums that took place at the mid-semester point looking at border-themed art on campus.

Beyond addressing the focus of each class meeting on the syllabus, we also created a course hashtag. This virtual connection that existed beyond the classroom walls not only allowed us to share content with students vis-à-vis social media forums, namely Twitter, but it also served as an ideal way for the three of us to connect beyond email. Through the course hashtag, we were able to take a digital pulse of the classroom, discerning where discussions had led and tracking the breadth of content covered in class across instructors. Reading student tweets and engaging virtually with the articles and images shared by students as well as our co-instructors allowed the instructors not present in class on a given week to gain insight with regards to the direction of the course and student learning. For future team-teaching projects, we would like to expand on the virtual component of the course by including more online community building opportunities by using social

media and online platforms as that proved to be a useful, and somewhat underutilized, tool for those of us not in the classroom to stay connected to the group discussions and dynamics.

The fact that the Honors Seminar we taught was a one-credit pass-fail course, with no student work to grade other than providing feedback on student presentations, meant that we could avoid the sometimes time-consuming and/or polarizing conversations about assessing student work. We were, however, tasked with addressing student concerns with respect to the joint roles of multi-instructor teams. Especially in the first class session of the semester, the first of the three joint sessions, we clearly discussed how power would be negotiated in the classroom, clarifying that each of us would represent a different field of expertise and that all of us would engage fully and equally in our semester-long discussions of global borders. Our shared roles in the instruction of the course, all as instructors of record, resonated with students during the first joint-taught class when we introduced our research interests and backgrounds while also consciously drawing connections between our interdisciplinary connections and the motivations that led us to create a team-taught course.

Ford & Gray (2011) discuss the importance of establishing the expectations regarding the role of each instructor in a team teaching model, noting how "questions of authority and credibility can be intertwined with preconceived ideas of gender and discipline in the classroom" (p. 103). In our case, we emphasized our roles as equally invested instructors in the course with different yet related areas of expertise. We did this in order to dispel any student assumptions about expertise and credibility based on institutional roles and titles as well as privileged identities in the classroom (in this case, we primarily mean the instructors' gender and ethnic identities – visible identities that are loaded with cultural biases). In our experience collaboratively teaching as a team of three, questions of authority and expertise did not come up during the semester and our students engaged with us as equal members of a multi-instructor course.

RESULTS

Given the fact that a different global border topic guided each class, with the exception of the first, a mid-semester, and the last meeting of the semester-long seminar that all three instructors attended and led, it is important to reflect on what the students learned, in a general sense, about global borders. After spending time discussing the Haitian-Dominican border, borders of the Middle East, the Iron Curtain dividing Western and Eastern Europe, divided Germany and the Berlin Wall, as well as maritime borders –

to list only a few of the frontier zones that guided our discussion – how much did students really take away from a collaboratively taught course with little work assigned outside of class? While the following section analyzes the students' narrative-based comments in regards to our collaboratively taught Honors Seminar, the quantitative data that we collected from several Likert-scale questions included on the pre- and post-test confirm that students' knowledge on and understanding of borders expanded as a direct result of this course.

Below is the survey tool that we used to assess students' perceptions of the team-taught Honors seminar:

> On a scale of 1 to 5 (1 being strongly agree, 2 agree, 3 neutral, 4 disagree, and 5 being strongly disagree), answer the following 4 questions:
>
> 1. I have an understanding and general knowledge about a wide range of global borders in regards to geopolitical borders and shifting border policies.
> 2. Metaphorical borders also exist and are important to consider when addressing the topic of borders.
> 3. I consider our local campus community as relatively "borderless."
> 4. Borders can stand for religious, racial, cultural, etc. dividers.
>
> For the next two questions, give a short (1-2 sentence response)
>
> 5. How did or how do you think a co-taught course addresses diverse, global perspectives of a given theme, in this case "borders," in ways that a solo-taught course (one instructor) may not?
> 6. What are you hoping will be/what was your biggest takeaway from this class?

In particular, on the pre-test, only 18% of students in the seminar stated that they agreed or strongly agreed that they had an "understanding and general knowledge about a wide range of global borders in regards to geopolitical borders and shifting border policies." On the post-test, however, 86% of the students in the course confirmed the same. This shift in perceived knowledge on global borders is a consequence of the varied interests and expertise of the team of instructors. As previously mentioned, our course also offered a sustained focus on metaphorical borders and introduced students to various borderlands theorists. Thus, in response to another statement on the pre- and post-tests, "metaphorical borders also exist and are important to

consider when addressing the topic of borders," 35% strongly agreed on the pre-test whereas an overwhelming 93% strongly agreed on the post-test. While on the pre-test those students who did not strongly agree in regards to the existence of metaphorical borders did indeed agree (65%) with the statement, the fact that nearly all students selected the strongly agree option on the post-test corroborates that the broad thematic focus of the seminar further exposed them to metaphorical borders: racial, cultural, economic, and otherwise.

Perhaps more importantly for the goals of the present article, this survey also included an open-ended question about student perceptions of multi-instructor courses. Notably, we elected to give the same survey on the first and last day of class and comparing the comments on the pre- and post-test allows us to gauge if students had doubts or concerns about the teaching model at the start of the semester. Students were informed that the course would be taught by three instructors from different disciplines but had not yet experienced this particular co-taught classroom environment at the time of the pre-course survey. Particularly striking is that of the sixteen students that responded to this initial pre-test, all indicated positive associations with a co-taught curriculum on the final question posed on the survey.

Student responses to the open-ended questions were transcribed and analyzed for trends and repeated word pairings and word clusters. Using the search function in Microsoft Word allowed us to easily detect patterns and then confirm the number of times certain words or word combinations appeared in the responses. For instance, multiple students used words and word combinations such as "multiple perspectives," "different perspectives," "unique perspectives," and insights from individuals with "different backgrounds" and "unique backgrounds" in the survey given before the course started. We took this to indicate that our students already had an appreciation for diversity in perspectives and opinions and that our students found value in learning from instructors with different and complimenting areas of expertise. Moreover, our students indicated that they valued having instructors not only with different research backgrounds but also with varying lived experiences and identities. Students were able to differentiate between these two and listed both as critical to a positive classroom experience. One student wrote, "the more ideas the better" while another offered the following: "One professor would not be able to do this, just because they haven't lived three different lives." In general, students expressed great enthusiasm for the co-taught course experience from the onset. Not one single respondent raised concerns or apprehensions about having more than one instructor for the class.

On the final day of class, students were asked to fill out a post-test – identical to the pre-test – in order to gauge shifts in perception and

understanding of the course subject as well as to evaluate the method of course delivery. The post-test results indicate that our students maintained positive associations with the co-taught course delivery following their experience with our course team-taught course model. Of the fifteen respondents who completed the post-course survey, not one expressed negative reactions to the co-taught course format. The open-ended survey responses were once again analyzed and scanned for trends and repetitions in wording and word clusters. Our results indicate that our students sustained appreciation for the co-taught classroom citing some of the same reasons, if not more enthusiastically, offered at the beginning of the class. Students appreciated having heard from multiple voices on the topic of borders. They also identified a value in learning about global issues from instructors who brought to the class not only their diverse professional backgrounds but their own unique experiences living and engaging with different borders of the world. One instructor, for example, shared her own experiences of living "behind the Iron Curtain" as a child and another described her background co-founding a global awareness-raising event that commemorates the 1937 Haitian Massacre on the Haitian-Dominican border. In regards to the diversity of experiences, one student wrote, "I loved it! It was so nice to have different perspectives, stories, and backgrounds." Another wrote, "Every instructor has different experiences and knowledge of global borders. It's foolish to think one person is an expert on all borders." Yet another wrote, "I think the class being co-taught was awesome to be able to learn so many different perspectives. One professor would have been okay but having three from very different backgrounds was awesome." In short, the co-taught classroom offered students a richer and more diverse learning experience, something they easily identified and appreciated. The overwhelmingly favorable student responses to the team-taught Honors Seminar, regardless of the small sample size, lead us to believe that the experience of having three as opposed to one instructor(s) of record resulted in a positive experience for the students enrolled in the course, prompting us to ask of ourselves and our colleagues how we can continue to build such learning opportunities into the curriculums we create.

Another valuable insight for students in the co-taught classroom relates to students critically assessing the subjectivity inherent in teaching practices. While we often position instructors as experts in the room, the collaborative classroom allows students to better recognize how teaching is not inherently neutral or objective. This is not offered as a reason to discredit solo instructor models, but instead to highlight one of the benefits of introducing multiple lenses into the classroom setting; students are able to see how subjectively we approach our disciplines and fields, ideally recognizing how they too bring their lived experiences and subjectivity to their majors and

areas of study. In doing so, students and instructors both can discuss the layers that go into learning and discussing a particular topic. Peeling back those layers – such as subject identity, positionality, subjective knowledge, and contextualized learning – allows for a more complex and nuanced understanding of a topic. Having recognized this, one student wrote, "It shows that the definition of what a 'border' may be can vary from person to person and place to place, which was seen throughout every topic." Another student wrote, "Each professor brought a different background and specialty, which challenged me to view borders in different manners." A final student concluded, "It allows diverse perspectives (from different backgrounds and experiences) to be presented. Students can learn and judge multiple sides to an issue."

As Abes (2009) argues, interdisciplinary research methods are of tremendous value to students because they demonstrate how multiple methodologies and lenses benefit our understanding of a topic. Szasz (2017) similarly suggests that interdisciplinary teaching benefits student development. Evident from the assessment of our interdisciplinary and collaboratively taught Honors Seminar on Global Borders is that students benefit both in terms of content acquisition and student development when offered a multidisciplinary seminar taught by colleagues with different perspectives and identities. Beyond the value of multidisciplinary approaches in Honors Seminar and in the undergraduate classroom in general, our goal in discussing student responses is to clearly address the value of team teaching as assessed by students in the team-taught classroom. While in the previous section we outlined a model for planning and implementing a collaboratively taught undergraduate Honors Seminar, also including student responses allows for the student perspective on the course to surface. Thus, coupled with our instructor reflections in regards to the collaboratively taught course, the quantitative and qualitative data from student pre- and post-tests makes a strong case for the positive student outcomes of collaborative teaching in the Honors classroom. Moreover, the multi-instructor offering of the course on global borders drove home the value of perspectivism; students clearly denoted that they appreciated and benefited from the expertise and multifarious research interests of multiple instructors and they were made aware of the myriad conceptual schemas to approaching (metaphorical and geopolitical) borders.

DISCUSSION AND CONCLUSIONS

Our intention with respect to our outline of a collaborative teaching experience of an Honors Seminar and the overwhelmingly positive student

responses to this model is to encourage other instructors involved with Honors programming to do the same. This is not to say, however, that there are not any challenges to co-teaching at the university level. One of the more common structural issues relates to scheduling and institutional support. While it can be difficult to find a teaching schedule that works for more than one instructor, the alternation of the teaching helps to alleviate the time that each instructor spends on the course. At the institution where we taught our course, scheduling of the seminar is flexible; instructors can elect to meet for one or two hours on the same day each week, or teach a condensed course for longer time periods over half of the semester.

Another issue regards the splitting of any honorarium or salary offered for teaching the seminar. While the amount (if any) allotted to instructors of a respective Honors Seminar varies per institution, many offer a modest honorarium to go toward professional and development funds. Sharing the funds in an equitable way could offer potential points of conflict given the fact that some instructors may be unable to discuss or negotiate this on their own (i.e., if an institutional policy dictated pay by rank or instructor role.) For this reason, we argue that ideal team teaching scenarios are realized at institutions where flexibility and autonomy is allotted to faculty so that colleagues can identify opportunities to collaborate and set parameters based on mutual agreement. At our institution, instructors of Honors courses are given free rein to elect how to share the honorarium provided.

One final point of discussion addresses how institutions facilitate networking opportunities for faculty and staff with similar teaching interests to connect and consider the idea of co-teaching. As both tenure and non-tenure eligible faculty can teach Honors Seminars on our campus, instructors are able to take advantage of myriad co-teaching opportunities to envision fruitful cross-departmental collaborations, perhaps out of which interdisciplinary research projects or future collaborations can grow. We argue that additional research and data around team-teaching across roles and positions at different types of institutions would benefit further discussions around productive and positive research and teaching collaborations. With the goal of creating interdisciplinary multi-instructor learning environments for Honors students, we advocate for further research on the subject of collaborative teaching within the Honors context in particular, and hope to encourage more mixed-methods research that support, in the words of one of our students, “the more ideas the better.”

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Environment-Based Supplementary Reading Materials for Junior High School Students

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ABSTRACT

One effort toward instilling environmental care in students is the development of environment-based supplementary reading materials. The objectives of this article are to investigate the need of junior high school students for environment-based supplementary reading materials, and to develop environment-based supplementary reading materials suitable for these students. The subjects of this research and development were eighth grade students of a junior high school. The resulting reading material has been developed into three units, each unit consisting of a list of new vocabulary, a comic, a main text, and exercises. The exercises at the end of each unit have the purpose of confirmation. The texts aim to convey an ideal relationship between humans and environment.

Keywords: environment-based materials, junior high school, reading

Programs focused on taking care of nature have been actively developed in Indonesian schools over the last few years. These programs can provide numerous benefits, such as providing knowledge, sharpening skills, and inculcating values so that learners can choose appropriate behavior to treat the environment (Scott & Oulton, 1998, p. 213). The programs introduce and instill the values of preservation and good management of the environment not only to students, but also to school members and the surrounding society

(Ministry of Environment and Ministry of Education and Culture, 2012, p. 4). The spirit of care toward nature is instilled in the hope that environmental problems can be minimalized or even prevented.

Care toward the environment is firmly stated in the Ministry of Education and Culture Regulation No. 20, 2016 on Graduates' Competency Standards, both in the elementary and secondary schools. This means that a graduate from any level of education is expected to master the concepts of environmental awareness in order to develop ethics and skills in caring for and preserving the environment. Scott & Oulton (1998, p. 214) state that schools have an important role in preparing citizens that can value, think, and act wishfully toward nature. The first step that a school should do is identify the environmental care value to be integrated into the curriculum.

To support the implementation of care toward nature programs in schools, the Indonesian Ministry of Environment has produced the Guidelines for the Development of Environmental Education Material Content Outlines, which contains the material scope as a reference to integrate it in every subject. In secondary schools, the material scope in question includes humans and their surroundings, types of physical environment, physical environment changes, ecosystems, maintaining environmental cleanliness and health, natural resources, water, coasts and oceans, air, global environmental damage due to pollution, energy, the forest, natural disasters, and man-made disasters (Ministry of Environment, 2011, p. 49-72).

Developing values in the school classroom, however, is not an easy task. Caduto (1985), as cited by Scott & Oulton (1998, p. 216), mentioned factors that hinder the development of values education in schools. Some of these factors are: (a) doubts of teachers, administrators, and parents about using the classroom to give value education; (b) uncertainty among teachers on how best to deal with student values; (c) inadequate training on values education; (d) fear of the surrounding society's reaction to values-based activities in the classroom; and (e) too much focus on subject matter.These various factors can also become obstacles in the implementation of environment-based curricula in schools.

Research conducted by Ela and Siti (2015, p. 11) indicated that one of the hindrances of the implementation of an environment-based curriculum for secondary schools is low teacher ability to develop integrated environmental content. In addition, research by Ahmad (2014, p. 170) found that an inability of teachers to connect materials to the school's environment also hinders the implementation of environment-based curricula.

Both aforementioned studies show that instilling caring attitudes toward the environment in the classroom is a challenging task. Difficulties are also noted when trying to instill this value through English learning.

Furthermore, the material scope to be covered in English classes has been specifically outlined by The Ministry of Education and Culture's Regulation No. 24, 2016 on Core Competency and Basic Competency.

Although it is difficult for the teachers, it is still hoped that they can develop caring attitudes toward the environment in their students as this provides a considerable benefit to society. One approach that can be used by teachers is introducing the values through literature. Edgington (2002: p. 113) has stated that literature that is relevant to children's lives can be used in character education. In the case of this research, the literature is in the form of supplementary reading materials.

Research has also been conducted on supplementary reading materials. Research conducted by Thakur (2015) used jokes, anecdotes, stories, situations, and journalistic cartoons as supplementary materials. Thakur suggested that these materials were advantageous to the students because they enabled the students to raise subjective analyses, improve self-awareness, and identify correlations and complexities in the materials. Supplementary reading material research conducted by Abbasi, et. al. (2015) on the effects of using supplementary textbooks (Gaj and Khate Sefid) on English as a foreign language (EFL) learners' reading skills also showed advantages. This research indicated that the use of supplementary materials can help learners to improve their autonomous learning of English, improving reading comprehension and other skills.

Thus, previous research has already shown positive impacts from the use of supplementary materials, and their use should be recommended to teachers. The previous studies did not, however, integrate environmental values into their supplementary materials. Hence, it is the aim of this research to develop environment-based supplementary reading materials for junior high school students.

It is hoped the results of this research motivate teachers to develop their own supplementary materials containing values education. Research conducted by Sailors, Martinez, Villareal (2015) has shown that teachers can author their own reading materials. The topics they included were the role education plays in improving lives, and the richness and diversity of South Africa. The research shows that when teachers create the materials they can relate it to the culture, linguistics, and lives experienced by their students. Students then have a greater understanding of the material and a greater ability to implement the values within their society.

When developing environment-themed reading supplements, the learning approaches must also be considered. Environmental education is closely related to the contextual teaching and learning (CTL) approach, which encourages students to learn from their surroundings. In other words, learning

must reflect the real-life situation of the students. This then supports the development of students' creativity and critical thinking, so that they can apply the knowledge learnt to solve problems that they encounter around them (Johnson in Dharma, 2010, p. 13). In regard to developing English reading materials, content

and outside the classroom.

Extensive reading aims not only to provide entertainment for students as they read, but also to expand the students' understanding of the language so that their skills will develop. "...[R]eading for pleasure (extensive reading) is the major source of our reading competence, our vocabulary and our ability to handle complex grammatical constructions" (Krashen in Miculeckly and Linda, 2007, p.3). Another opinion on the benefits of extensive reading is expressed by Day and Bradford, also in Miculeckly and Linda (2007, p.3): "Extensive reading may play a role in developing the capacity for critical thinking that is so important for success in higher education." By getting the students accustomed to extensive reading, we can expect that they will be able to solve relevant to the students' lives helps them to understand the passages as a whole.

It is also hoped the results of this research provide authentic supplementary materials that can support both inculcating environmental care values and improving students' reading comprehension. This aim is in line with Guo's research (2012) which showed that authentic materials expose students to English usage as it is used in real life. Additionally, Guo's research showed that extensive reading of authentic texts can improve students' vocabulary mastery and motivation for learning English. Extensive reading activities can be done both inside many problems and continue to higher levels of education.

In developing such materials, attention must be paid to the principles. The materials to be developed must be aimed at fulfilling students' needs and developing students' potentials. Material developers must understand that every student has different characteristics in terms of personality, intelligence, interest, talent, and learning style and such differences must be well accommodated. Furthermore, the development of communicative competence must also be given attention by allocating ample opportunities for students to use the language according to context, feedback, and authentic assessment (Tomlinson, 2011, p. 8-23).

Based on the above literature review, it can be concluded that extensive reading of environment-themed texts is a very possible means of instilling environmental awareness values, while at the same time providing motivation for students to read English texts. However, the availability of environment-themed English texts is still limited as they are not easy to develop. Therefore,

the researcher is interested in 1) investigating the need of junior high school students for environment-themed texts; and 2) developing environment-themed texts that are suitable for junior high school students.

RESEARCH METHOD

Instruments

The questionnaires used in the research consisted of two types: 1) questionnaires given to students to determine their needs when it comes to supplementary reading materials, and 2) questionnaires given to the language education experts to assess the materials produced and provide revisions. The data obtained from the first set of questionnaires was used to develop the final draft of the materials.

Procedures

This research is developmental research. The procedures used in this research followed a modified version of the research and development steps proposed by Borg & Gall (1983, p. 775-776). The procedures were of four development types, namely, the exploration stage, prototype development stage, revision stage, and finalization stage. The exploration stage included a needs analysis, which involved collecting information from questionnaires to obtain the preliminary data about the need of supplementary reading material.The prototype development stage included the stages of planning and developing the format/draft. The activities performed during this stage were preparing questionnaire sheets and a prototype, and the result was the new supplementary reading materials. The revision stage was completed through assessment of the preliminary draft of the materials by two experts of language education. In the finalization stage, suggestions and input from the experts formed the basis of the product evaluation and improvement to the final product.

Data analysis

Data was obtained through the distribution of questionnaires. The responses given were analyzed quantitatively based on frequency and percentage. The questionnaires employed the Likert-scale of measurement which consisted of the four options Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

FINDINGS

The development of the environment-based supplementary reading materials began with a needs analysis in the form of a questionnaire. The questionnaire consisted of 17 questions that were compiled according to the guidelines of Nation and Macalister (2010), which states that a questionnaire should be divided into three parts: necessities, lacks, and wants. The questionnaires were distributed to 36 8th grade students of a junior high school in Yogyakarta. They were allowed to choose more than 1 answer provided in the questionnaire or write their own answers.

The findings are as follows:

Junior High School Students' Need for Environment-Based Supplementary Reading Materials

1. Necessities

Based on the results of the need analysis, three types of text were developed in this research: Narrative, Descriptive and Recount Text. Narrative and Descriptive text are the text types considered to be necessary reading by the students, whereas Recount text is the one the students consider difficult to understand. Texts with an environmental theme will be developed by combining the topics of human and the environment. Students have also shown a tendency to choose texts related to the topics of health and education.

Table 1. The necessary texts for students

No	Type of text	Percentage
1	Narrative text	47.2%
2	Descriptive text	30.6%
3	Recount text	25.0%
4	Procedure text	16.7%
5	News item	5.6%
6	Report text	16.7%
7	Analytical Exposition text	13.9%
8	Hortatory Exposition text	16.7%
9	Discussion text	5.6%
10	Review text	0%
11	Spoof text	0%
12	Explanation text	2.8%

Table 2. The important topics for the students

No	Topic	Percentage
1	Humans and the environment	94.4%
2	Air	8.3%
3	Water	5.6%
4	Soil	8.6%
5	Energy	5.6%
6	Forest	16.7%
7	Disaster	13.9%

Table 3. The related discipline (to environmental issues) considered to be essential for the students

No	Discipline	Percentage
1	Health	33.3%
2	Education	50%
3	Tourism	11.1%
4	Technology	19.4%
5	Science	11.1%

2. Lacks

To gain an understanding of the students' level of English proficiency, the researcher asked for the students' average English test scores during the need analysis. The majority of students stated scores within the range of 80-89. Even so, the students admitted that their mastery of English vocabulary was still poor and created an obstacle for reading English texts. The students also stated that they seldom read English text, and only do this 1-2 times a day. On the contrary, their reading skills, in terms of understanding content, are good as they only need 10-20 minutes to finish a text.

Table 4. Score range of students' English tests

No	Score	Percentage
1	90-100	8.3%
2	80-89	52.8%
3	70-79	30.6%
4	60-69	8.3%

Table 5. The difficult texts for students

No	Type of text	Percentage
1	Narrative text	11.1%
2	Descriptive text	22.2%
3	Recount text	41.7%
4	Procedure text	5.6%
5	News item	16.7%
6	Report text	11.1%
7	Analytical Exposition text	13.9%
8	Hortatory Exposition text	13.9%
9	Discussion text	5.6%
10	Review text	2.8%
11	Spoof text	2.8%
12	Explanation text	0%

Table 6. The biggest obstacles in reading English texts

No	Obstacle	Percentage
1	a lack of vocabulary mastery	69.4%
2	a lack of grammar mastery	33.3%
3	not being familiar with the topic/ title/ reading content	5.6%

Table 7. The English text reading frequency of the students

No	Frequency	Percentage
1	1-2 times per day	72.2%
2	3-4 times per day	16.7%
3	>5 times per day	11.1%

Table 8. The time needed by students to complete an English text

No	The time needed	Percentage
1	10-20 minutes	16.7%
2	21-30 minutes	44.4%
3	>30 minutes	38.9 %

3. Wants

Supplementary reading materials for intensive reading should be suited to the students' interests and relate to their daily activities. These criteria became the focus for the researcher when formulating supplementary materials to support the pre-, main, and post-activities of reading. According to the results of the need analysis, the students are accustomed to finding the

meaning of new vocabulary before starting reading. While reading, the students take notes about points related to the aspects of 5W+1H (what, when, where, who, why, and how). The students prefer to answer questions about the text upon finishing reading.

Table 9. The pre-reading activities needed by students

No	Pre-reading activity	Percentage
1	finding the new vocabulary that appears in the text	83.3%
2	identifying the types and generic structure of the text	27.8%

Table 10. The while-reading activities needed by students

No	While-reading activity	Percentage
1	taking notes of the important information from the text	94.4%
2	drawing a graph, diagram, or table based on the text	8.3%
3	finding main the idea of each paragraph	8.3%

Table 11. The post-reading activities needed by students

No	Post-reading activity	Percentage
1	answering the question	75%
2	making a synopsis	16.7%
3	discussing opinions and solutions regarding the issue or problem that appears in the text	8.3%

For the material design, the students requested texts of 150-200 words in length. However, there were also many students who preferred texts of 250 words. They stated that an enjoyable reading time was about 30-60 minutes per text, and only one text per day. The students also stated the use of images was important and requested many appear in the text, like a comic would appear. In addition, the students also wanted to have illustrations of the vocabulary. The students indicated that texts with relevance to their surrounding environment were more interesting and quicker to read (due to greater ease of understanding). In short, the texts should be contextual and meaningful to the students.

Table 12. The word range per text preferred by the students

No	The word range per text	Percentage
1	200-250 words	36.1%
2	100-250 words	11.1%
3	150-200 words	2.8%
4	>250 words	50%

Table 13. The enjoyable amount of time to read a text

No	The enjoyable amount of time to read	Percentage
1	30 minutes per day	33%
2	30-60 minutes per day	52.8 %
3	60-90 minutes per day	13.9 %

Table 14. The preferred number of texts to be read in a day

No	The preferred number of texts to be read	Percentage
1	1 text per day	50%
2	2 texts per day	27.8%
3	>2 texts per day	22.2%

Table 15. The appearance of images in the text

No	The appearance of images	Percentage
1	Some images	66.7%
2	One image	30.6%
3	No image available	2.8%

Table 16. The appearance of English equivalent in the text

No	The appearance of English equivalent	Percentage
1	List of new vocabularies	52.8%
2	Illustrations of new vocabularies	30.6%
3	There is no list of new vocabularies	16.7%

Table 17. The criteria for an interesting text

No	The criteria for an interesting text	Percentage
1	Texts with relevance to students surrounding environment	44.4 %
2	Texts with moral value	41.7%
3	Texts with attractive title	16.7%
4	Texts with simple words and sentences	16.7%
5	Texts with attractive images	13.9%.

Characteristics of Environment-Based Supplementary Reading Materials for Junior High School Students

1. First Draft

This supplementary reading has been developed into three units. Each unit consists of a green dictionary, comic, main text, and exercises. As indicated by the results of the need analysis, the students tend to read the vocabulary list of the reading first. The vocabulary meanings have been illustrated.

In the next stage, the students face the comic. The development of the comic was also based on the need analysis results, which revealed that the students want to see images during the reading to assist their understanding. The content of the comic for each unit is similar to that of the following main text. Thus, the comic gives a prior illustration of the content of the text to come. The comic uses direct, and shorter, sentences than those that appear in the main text.

The texts that have been developed by the researcher in the supplementary reading material consist of narrative, descriptive, and recount texts. As mentioned earlier, the majority of students consider the narrative and descriptive texts as the most important ones to learn, while recount is considered to be the most difficult. The length of the texts in each unit ranges from 250-325 words, based on many students stating that they prefer to read texts with more than 250 words. The length and complexity of the sentences used in the texts have been adjusted by the researcher to suit the English proficiency level of the students, which is intermediate.

In each text, the researcher has also written about generic structures. The topics are related to humans and the environment, which are then further related to the topics of education and health. A preference for these topics was indicated by the need analysis results.

In unit I, the researcher has developed a recount text. This text tells of the experience of a group of students who conducted community service after a flood disaster. These students held a crafts bazaar in which the crafts had been made from recycled waste at their school. In the middle part of the text, the students of the story visit a refugee camp and share their knowledge of how to turn waste into something valuable. The lesson intended by the researcher is that it is better to not just give money in the event of a disaster but to also provide knowledge and skills that may prevent, or minimize the impact of, future flood disasters. This is the provoking part of the story. The students donate money that they made by selling recycled waste to people

who had underestimated the value of waste and allowed garbage to accumulate in their area, which was a contributing factor to the flood itself.

In unit II, the researcher has developed a descriptive text. The text describes an environmental activity conducted by a school organization known as Klub Hijau (Green Club). The description is the researcher's effort to illustrate how an adiwayata school (school which focuses on environmental issues), or any other school, can provide great opportunities to participate in activities that develop a sense of concern for the environment. The activities run by Klub Hijau include managing a greenhouse with herbal and edible plants, making compost from leaf matter at school, and selling their produce in a school store. The money they make from selling the produce goes toward taking care of the greenhouse, buying hand soap, and conducting community service. In addition, competitions are run by the club to minimize the amount of garbage being produced by the school. Such competitions include posters about cleanliness, class gardens, and garbage recycling. Klub Hijau also has a team who monitors other students to identify any environmentally destructive attitudes.

The genre of unit III's text is narrative. In this text, the researcher aims to convey the ideal relationship between humans and the environment. The text begins by describing how the life of people in a poor kingdom changed to a life of prosperity when they used their skills to make use of the natural resources in the area. It then goes on to show how if humans lose control, become greedy, and behave destructively toward the environment, disaster will result. In this story, the consequence of the people's behavior is illustrated in the form of a giant. The researcher chose a giant because it is a figure that is familiar to kids, including Indonesian kids, who often hear of giants in stories.

The last step of each unit contains exercises as confirmation of understanding. Each exercise given to the students requires them to recall information and ideas from the story using aspects of the 5W+1H. The students are expected to sum up the content of the text and identify other implied points that might not have been noticed while reading. Following this, they are also given several questions about the environmental values and characters appearing in the text. Students are expected to be able to reflect on the story and internalize the environmental values so that they can think more critically when it comes to problems concerning the environment.

2. Expert Evaluation

Upon completion of the first draft, the researcher sought assistance from a lecturer of English Education and an English teacher of a Junior High School to evaluate the supplementary reading material in terms of content,

language, layout, and imagery. The evaluation was conducted using a Likert-scale questionnaire which consisted of 20 questions and one open-ended question to allow the experts to write any additional notes with input or revisions.

The content aspect of the questionnaire covered the environmental values, appropriateness of text type and the generic structures, relevance with the students' lives, and suitability between the difficulty and the English proficiency level of the students. The language aspect covered the use of grammar, the suitability of diction with the content of the text, and spelling. Questions regarding layout discussed the inclusion of a green dictionary, a preliminary comic with simpler language than the text, titles for every text, and discussion of the text itself. The imagery aspect covered the appropriateness and interest of fonts, vocabulary illustrations, comic illustrations, and the layout of the text.

The experts gave input on the content and language use. One of the experts suggested not to include the generic structures in the text but to present them in the later exercises. This encourages the students to understand the function and application of the generic structure from each text inductively.

3. Final Draft

The results of the expert evaluation were then utilized in the revision of the first draft. Based on the experts' input, no generic structure of text type was written beside the text. The students' understanding of the function of the text instead became part of the exercises. In additional revision, questions related to the students' opinions of the figures in the story and their similar personal experiences or environment were added to the exercises. In unit I, the number of questions was revised from 7 to 11. In unit II, there were minor mistakes in diction and spelling within the text. Also, four questions were added to this section, creating a total of 11. In unit III, there was a minor revision of the text structure and a change in question number to 11.

DISCUSSION AND CONCLUSIONS

These supplementary reading materials composed of three steps of reading, namely pre-reading, while-reading, and post-reading for each text. In the pre-reading step, the students asked for a list of new vocabulary with the meaning in the form of images to help them understand the core text. This is because the students understand their lack of vocabulary mastery, so they find it difficult to comprehend the reading materials. This obstacle is in line with the results of research conducted by Yorio (1972, p. 109-113) claiming that the main obstacle faced by EFL students in reading is the lack of vocabulary

mastery. To help understand a text, as many as 90% of students preferred using bilingual dictionaries to monolingual dictionaries. The importance of mastering vocabulary to help understand the contents of a text more easily is revealed by Mousavian and Siahpoosh (2018) in their research among 60 Iranian EFL students. As many as 20 students were given pre-teaching vocabulary; 20 were given the pre-questioning strategy, and 20 others in the control group were provided with the conventional method before taking the reading test. The results show that the students who were provided with pre-teaching vocabulary reached the highest scores of pre- and post-test.

The correlation between mastery of vocabulary and reading comprehension has been reported in a study by Zhang and Anual (2008). In the study, 37 students studying English in Singapore were given a vocabulary mastery test. The results of the study showed that there is a correlation between levels of vocabulary mastery and students' reading comprehension. The results of a study by Sidek and Rahim (2015) among EFL students in Malaysia also indicated that vocabulary mastery is one of the important factors that influences students' understanding of a text. Sen and Kuleli (2015) also found similar results that there is a correlation between levels of vocabulary mastery of EFL students in Turkey with their ability to understand a text.

In the list of new vocabulary, the students wanted the equivalent meaning to be given through image symbols. The images were expected to increase the students' motivation and to help them understand the synonym of the new words. The results of a study by Carpenter and Oslon (2012) showed that images can support students' understanding of foreign language words. However, both of them note such support "as long as participants are not too overconfident in the power of a picture to help them learn a new word." Another study was conducted by Donal (2012) among EFL students in Indonesia to find out the impact of using images on English language learning. The results showed that the use of images can improve vocabulary mastery and students' motivation in learning the language.

After understanding the synonym of the new words that would appear in the texts, the students would first read comics. The comics contained the same story as the main texts, but they used shorter sentences and had pictures that would facilitate the students to understand the contents and the storylines. Similar research was conducted by Ju, Hung, and Chi (2015) aiming to determine the effect of the use of comics among 28 EFL second grade students in Taiwan. The results showed that comics can be used to improve vocabulary mastery, reading comprehension, and students' motivation in learning English. The positive impact of comics on increasing vocabulary mastery and

reading motivation is also reported by Cimermanova (2015) carried out among four EFL students of 10-20 years old.

In the while-reading step, the students chose to use the strategy of recording important information to help them understand the contents of the texts. Tsai (2009) reported that this strategy was effective to help 100 EFL students in Taiwan understand a text. The results of a study by Bahrami and Nosratzadeh (2017) about the strategy of recording important information in while-reading activity by 40 EFL students in Iran also showed the same thing.

In the last step, the post-reading, the students preferred answering questions related to the texts. Nuttall (1996) in (Wahjudi, 2010:86) suggested that in the post-reading step, students were guided to evaluate the contents of a text using their respective perspectives. The questions developed in this study were of three parts. First, the questions were to remind the students of the contents of the texts. Second, they were used to explore students' personal views of characters and the values of environmental awareness in the text. Third, they were intended to facilitate the students to understand the parts and functions of the paragraphs of each text. In general, these questions have a function to recall information that the students have obtained from the texts and develop new knowledge based on previous information (Wahjudi, 2010:87).

It is not easy to instill the value of environmental awareness. Nevertheless, considering the great benefits of it, teachers are expected to try to integrate it in any learning, including English language learning. One of the efforts that can be implemented is by providing additional environment-based reading materials as an extensive reading activity both inside and outside the classroom. Thus, students are expected to become independent learners.

These additional environment-based reading materials have been developed according to the needs of EFL students at the junior high school level. The activities needed in the pre-reading, while-reading, and post-reading steps are accommodated in the materials. The activities developed are also based on a number of theories and studies on the results of previous studies.

Research on imparting the value of environmental awareness in the English language learning is of a broad scope. This research focuses on developing additional materials to support reading skills. Future research with a focus on developing environmental awareness in other language skills can be carried out. It is hoped that students will be able to develop all their language skills along with their concern for the environment.

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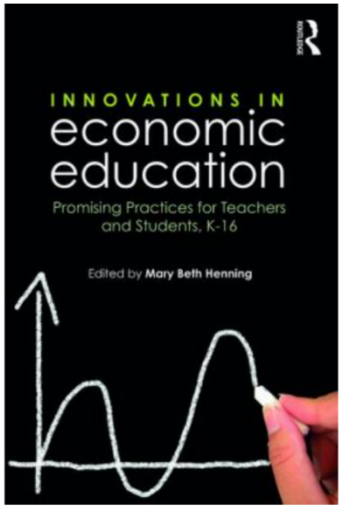
Innovation in Economic Education



Reviewed by

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Economic integration in the K-16 space is one facet of the American education system that depicts inadequacy yet potential. Mary Beth Henning alongside several educational specialists and economists illustrate how economics can be taught in a multidisciplinary manner through the mandated disciplines, such as math, reading, and history. The authors of this book demonstrate the need for students to develop an economic way of thinking through three themes focusing on: interdisciplinary integration of economics, blended learning, and economic educator preparation. I would highly recommend this book to K-16 educators looking to integrate economics into core academic subjects through age-appropriate and relevant examples intending to promote economic ways of thinking among students.

This book contains ten chapters, each written by a different author, thus providing a variety of experience and insight into interdisciplinary best practices. This book depicts both the need for economic education as well as the potential methods of implementation for educators to use in incorporating economics into their instruction.

INTERDISCIPLINARY ECONOMICS

Economic literacy is a key attribute that youth should be equipped with when entering the workforce and when partaking in civic and community responsibilities. The premise of economics being interdisciplinary is prevalent throughout this book. The authors and the editors depict how simulation in classroom instruction can promote higher-level thinking of citizenship, community, and economic class perceptions. The book includes several examples of how students can simulate activities that represent given economic trends. One example is through a peanut butter and jelly assembly line activity. Through this activity, students can learn about production efficiency and quality, the historical context of assembly lines and the industrial revolution, the mathematical aspects of worker compensation and the business cycle, and how these events or concepts play a role in the larger economy.

The contributors in the chapters highlight other ways in teaching economics through social studies and mathematics while ensuring instruction meets state standards, particularly at the secondary level. The book outlines examples from history that have economic prevalence, such as the Cold or Civil wars. The economic underpinnings of this history can be used as practice and to give context in mathematics. Using lessons on interest rates and inflation to help students work with percentages or using algebra and graphing to understand the economic production function are examples of effective interdisciplinary education.

Interdisciplinary work also comes through in the discussion of integrating economic literacy and justice through the arts and literature. An example is having students find their own representations of substitutes versus complements, expressing them visually, or discussing scarcity and giving materials to groups of students to see what they make. The debriefing process following these activities is also stressed as an integral component. Concurrently, the authors highlight how culturally relevant literature can bring economic and historic concepts to life, simultaneously, such as in the Great Depression, immigration/settlement, and WWII. The authors emphasize the significance in involving parents in developing a child's economic mindset. Children are asked to make choices about toys, activities, food, etc. very early in life, all of which involve understanding needs, wants, and consumer choices. This can be capitalized on through reading literature in school and further extended through conversations at home.

BLENDED LEARNING

Blended learning prevails across this book and specifically highlights technology and computer systems that bring economic education to life through the use of data. Several platforms of data allow students to create graphs and learn more about economic systems, while computer applications and games let students engage within systems and take on roles that emphasize economic decision making. In terms of teacher preparation and curriculum, several chapters highlight how economic literacy can be incorporated into curriculum and why K-12 teacher preparation programs are essential to make connections across these disciplines. The book outlines a specific teacher preparation program at Purdue University that helps train future educators on combining economics with core subject curriculum through a variety of applicable strategies.

IMPLICATIONS

Although notions across the K-12 space are that students are unable to comprehend economics, students are often learning these concepts unbeknownst to them. Students can understand the premise of opportunity costs by watching Space Jam, can learn about economic inequality by discussing the Hunger Games or the Civil War, and can comprehend what factors led to and further inflicted the Great Recession. As a recommendation, incorporating more information on integrating economic teaching across higher education would have been fitting. As prefaced in the book, the lack of economic thinking amongst students stifles and affects their decisions and understanding of the world around them. If K-12 students are not leaving our education system with the appropriate knowledge in economics, higher education instructors should make efforts to embed and promote economic ways of thinking through their own pedagogy. Economics surrounds students and will play an integral role in their lives, thus it is vital that educators incorporate these real-world concepts, experiences, and decision-making opportunities into core instruction. Although some state standards include economics within core subjects, they often do not offer a practical way for educators to approach related lessons. This book provides a thorough analysis of how the content is relevant and how economic integration can be successful and achievable.

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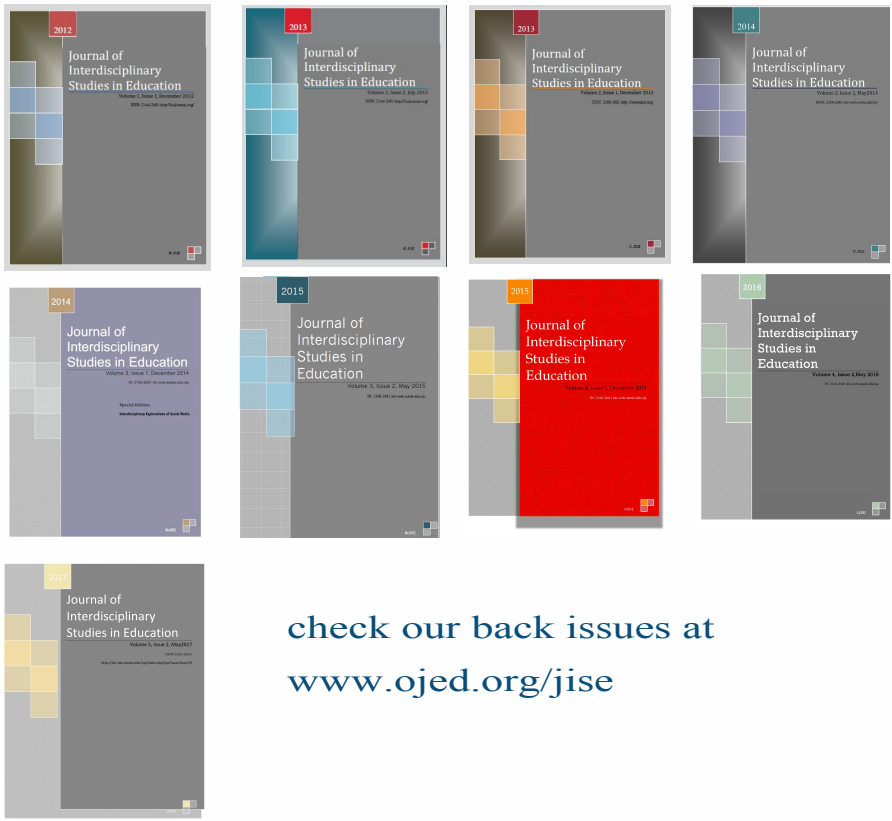

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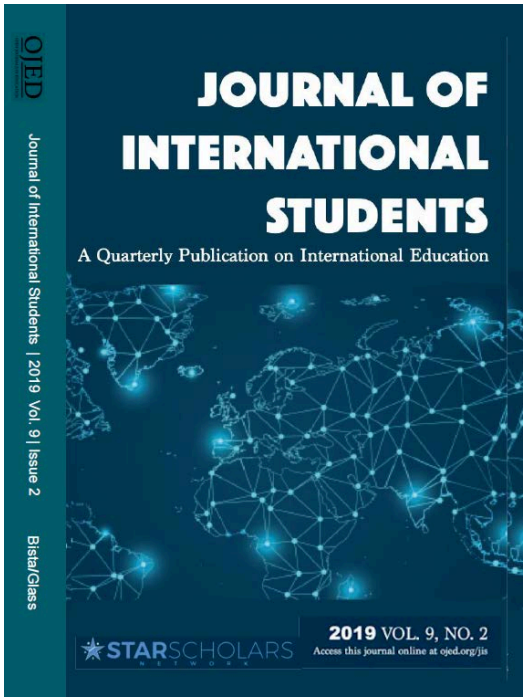

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