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Tapping into Graduate Students' Collaborative Technology Experience in a Research Methods Class: Insights on Teaching Research Methods in a Malaysian and American Setting

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This case study used qualitative and quantitative methods to investigate challenges of learning and teaching research methods by examining graduate students' use of collaborative technology (i.e., digital tools that enable collaboration and information seeking such as software and social media) and students' computer self-efficacy. We conducted virtual focus groups and surveyed graduate education students taking required research methodology courses in Klang Valley (Malaysia) and Florida (USA). A thematic analysis showed learning research methods evoked emotions for students, students used collaborative technology for learning primarily at one university, and students needed support to access online literature and data sources. Survey results indicated that all students, however, had high levels of computer self-efficacy. Overall results showed that Malaysian women had the strongest computer self-efficacy belief. Our study suggests that collaborative technology for learning and teaching research methods may be underutilized to engage student learning and that faculty responsible for teaching methods courses need to be aware of the emotional side of learning and offer supports, such as collaborative technology, to connect students.

Preparing future researchers and consumers of research in a technologically rich era is a responsibility of higher education faculty worldwide. Graduate programs in education typically require a research methods course and many offer computer-assisted instruction, as is the case for Klang Valley (KV, Malaysia) and Florida (FL, United States), our study sites. We cannot assume all graduate students aspire to become critical consumers and producers of high quality research, yet the field of education has been criticized for not generating quality research that is applied to practice (Lagemann, 2000; Walters, Lareau, & Ranis, 2009). Faculty today are challenged to meet the diverse needs of learners using communication technologies (Barrett & Lally, 2000) while integrating methods knowledge and skills across the curriculum (Willison, 2012). Our study aimed to expand our understanding of how best to teach research methods.

Scholars are investigating ways to strengthen educational research and better prepare graduate students in research methods for our complex, technologically advanced society (Lagemann & Shulman, 1999; Maxwell, 2012; Page, 2001; Pallas, 2001), and literature on teaching research methods is growing (Earley, 2014; Kilburn, Nind, & Wiles, 2014). Some authors, however, point to the lack of formal pedagogy (Wagner, Garner, & Kawulich, 2011), and others to limited empirical evidence on teaching research methods from a constructivist learning perspective (Drago-Severson, Maslin-Ostrowski, Ashhar, & Steubner Gaylor, 2015). A key to constructivist practice is discussion whereby students reflect, elucidate prior knowledge, and collaborate (Bridges, 1988; Foote, Vermette, & Battaglia, 2001; Good & Brophy, 2000). Researchers have begun to explore the use of collaborative technology, such as blogging, to support collaborative learning among university students (Jimoyiannis, Tsiotakis, & Roussinos, 2013) and how to enhance collaboration when working with students from different cultural backgrounds, specifically the socio-cultural influences when using online discussion forums (Van der Merwe & De Villiers, 2012). With the advent of Web 2.0, the internet was transformed from a storehouse of information to an interactive and collaborative venue where "knowledge is decentralized, accessible and co-constructed" (Greenhow, Robelia, & Hughes, 2009, p. 247). Given the proliferation and popularity of collaborative technologies (e.g., social networks like Twitter, Facebook and Linkedin), it would be beneficial to know how this is relevant to learning and applied in a research methods class.

The purpose of this case study was to expand our understanding of the challenges and opportunities of teaching and learning research methods in education by investigating how collaborative technology supports students' learning in required introductory graduate level research methods classes and by examining students' computer self-efficacy in the context of this learning. We define collaborative technology as digital tools that enable collaboration and information seeking, such as software and social media. We define computer self-efficacy as the perceived ability to use computer applications to complete assignments, perform academic tasks, and seek digital information.

Our guiding research questions were: How do graduate students in education use collaborative

technology to support learning research methods? What is their computer self-efficacy?

Theoretical Framework

The study is built on the assumption that learning research methods is interdependent with learning abilities and computer self-efficacy. We address the literature on learning research methods, technology, and self-efficacy.

Learning Research Methods and Technology

Scholars suggest that students learn research methods best by doing and going through the research process (Simon & Elen, 2007). This is consistent with a constructivist learning approach. Constructivist learning theory posits that (a) learners construct their own learning in ways that makes sense to them, (b) new learning is contingent upon current understanding, (c) learning occurs by engaging in real-world endeavors, and (d) learning is enabled by social interaction (Bruner, 1990; Dewey, 1938; Vygotsky, 1978).

Kilburn and colleagues (2014) identified three inter-related pedagogical goals for teaching research methods. First, engage students in the many facets of research methods so the research process becomes evident. Second, offer opportunities to conduct research to facilitate learning, and third, foster critical reflection on research practice. When faculty nurture a supportive learning environment, students may feel comfortable and inspired to collaborate, and to construct and control their own learning (Confrey, 1985; Foote et al., 2001).

Researchers and research methodology faculty routinely integrate software and web-based tools into their research practice and teaching. Such integration is believed to improve educational research and instruction, assist university students with academics, and enhance motivation (Güzeller, 2012; Tang & Austin, 2009). Furthermore, access to digital technology allows students to seek information (Laurillart, 2009; Strayhorn, 2009) and support collaborative learning.

Studies indicate that while students are comfortable utilizing technology there is discomfort with using more complex databases. Researchers found that graduate education students preferred regular internet sources, including non-education databases, rather than complex library databases for obtaining information (Blummer, Watulak & Kenton, 2013; Catalano, 2010; Earp, 2008).

Computer Self-efficacy

Self-efficacy refers to a person's judgment of his or her ability to perform a certain task or activity (Bandura, 1986). Torkzadeh, Koufteros, and Pflughoeft (2003) highlight the essential role of computer self-efficacy and its likely impact on usage of information systems technology. Torkzadeh and colleagues (2003) tested the validity of a revised four-factor computer self-efficacy scale (CSES) created by Torkzadeh and Koufteros (1994). We used the revised CSES to determine if students would feel efficacious using computers, for example to access digital information and databases.

Previous research found that gender differences play a significant role in relation to student self-efficacy and motivation and that male students tend to have higher computer self-efficacy than female students (Ates, 2011). Self-efficacy beliefs can explain gender differences in motivation and achievement (Ross, Scott, & Bruce, 2012). Wong, Teo, and Russo (2012) found significant gender differences in the "effect of computer teaching efficacy on perceived usefulness and attitude toward computer use" (p. 1203). In Malaysia, female university students were "more strongly influenced by their … ability to teach with computers, and … their belief about using computers as effective teaching methods to improve students' performance" than males (p. 1203). This meant that, unlike men, women would be more strongly influenced by their own ability to teach with technology. Online learning can be lonely and frustrating due to limited social interaction (Williams, Duray, & Reddy, 2006), and it requires strong motivation (Tai as cited in Rienties, Tempelaar, Van den Bossche Gijselaers, & Segers, 2009). Using social media as a tool to enhance students' motivation has been suggested (Tananuraksakul, 2015). Social media could also help motivate students and support learning in traditional (e.g., class meets on campus) and hybrid (e.g., a mix of on campus and online learning) research methods classes.

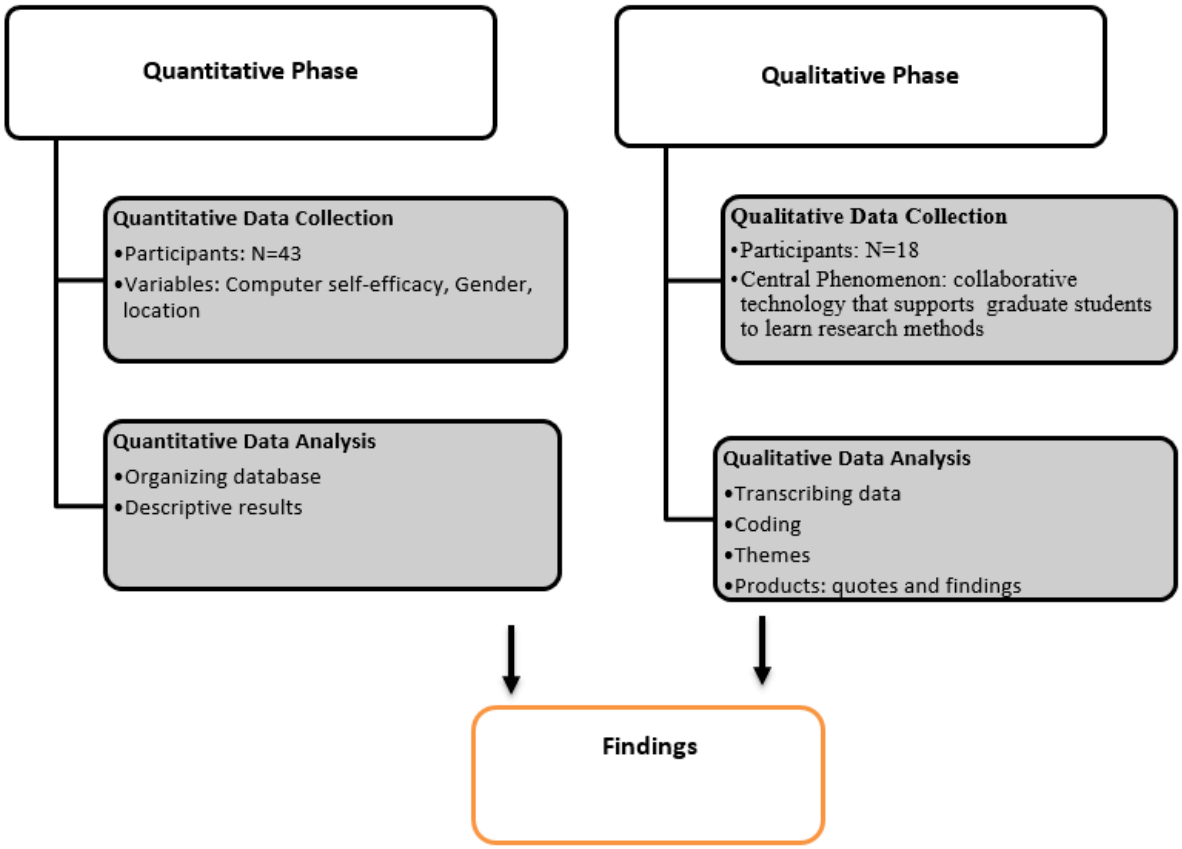
Method

We used a case study design to study a case within a real life setting (Stake, 1995; Yin, 2013). The study was bounded by graduate students taking required introductory methods courses at two universities. We collected data using a survey, focus groups, and document analysis. Figure 1 illustrates the study phases, procedures, and data analysis.

Research Setting

We collaborated with two large public universities in Malaysia and the United States, the University of Malaya (Klang Valley) and Florida Atlantic University (Florida), that offer graduate programs in education and require coursework in research methods. The universities had convened for scholarly exchanges, and this relationship inspired the site selections. The

Figure 1
Study Design



partnership provided a convenient pathway to cooperation across the institutions.

The universities provide traditional and e-learning courses for certification and degree granting programs. Beyond online courses, there are numerous technology resources available to students, including access to computers, the internet, and electronic databases. English is the language of instruction at both universities.

The research team serves on the respective faculties, one member from UM and two from FAU. Members of the research team teach methods classes. Based on this experience, we had the assumption that it is not unusual for students to struggle in these courses. No classes of the research team were included.

Klang Valley (Malaysia). Located in Southeast Asia, Malaysia has a population of 31 million people (Department of Statistics Malaysia, July, 2016). It is multiracial, consisting of 61 percent Malays, 30 percent Chinese, eight percent Indians, and one percent other ethnic groups. Malay is the main language used in public education and is supported by instruction in English, Mandarin, and Tamil to represent each race's mother tongue. Most universities are located in the Kuala Lumpur (KL) area, the capital of Malaysia. Along with KL, Klang Valley is in the central part of the country. This region is home to six million people, about 20 percent of Malaysia's population. UM is a public research university located in Klang Valley and offers undergraduate and graduate degrees, including education programs. Founded in 1949, it is the country's oldest university (Institute of Graduate Studies, University of Malaya, 2016). Today it has 2442 faculty, 8,300 undergraduate students locally and internationally, and 9,270 post-graduate students (University of Malaya Official Portal, 2016).

Florida (United States). Florida, the most southeastern US state, has a population of nearly 20 million people (US Census, 2015) and is diverse in race and ethnicity. The three largest groups are whites (75%), Latino or Hispanic (23%), and black or African American (16%). Florida Atlantic University (FAU) is located in South Florida where the primary languages spoken are English, Spanish, and Creole. The state higher education system has 28 public institutions that

grant two-and four year academic degrees (Higher Education Coordinating Council, 2012). FAU is a public institution that offers baccalaureate, masters, specialist, and doctoral degrees. There are five campuses with an overall enrollment of 30,000 students. The College of Education has 1,111 graduate students (FAU Banner Database, 2016).

Sample

The study utilized a purposeful survey sample of 43 graduate students enrolled in required introductory research methods courses for education programs and a focus group sample of 18 graduate students across the two sites. The focus groups constituted a sub-set of the survey sample. The classes selected were required introductory methods courses for masters' degree students and prerequisites for doctoral students. Classes were not screened in advance for their use of technology and collaboration. Instead we invited all instructors to e-mail the invitation to their students regardless of class format. There was no incentive for participation or penalty for nonparticipation.

Of the combined survey sample (N=43), 20 in Klang Valley (KV), Malaysia and 23 in Florida (FL), USA completed the survey. Thirty students were enrolled in a face-to-face course delivery format, 12 in a fully online course, and one in a hybrid course. A majority of students (25:43) were between 35-44 years old. There were 14 male and 28 female students. Students enrolled in these classes were preparing for advanced degrees in a variety of programs in education, such as educational leadership, curriculum and instruction, school counseling and exceptional student education.

Focus group participants were recruited on the survey, as mentioned. Students who completed the survey were invited to send an e-mail to the research team if interested in participating in a follow-up focus group. This step ensured anonymity on the survey. Six students from KV, Malaysia and 12 students from FL, USA responded and participated.

For document analysis, instructors provided the course syllabus. Some syllabi were available on the university web sites. Each program used a standardized syllabus for these required introductory courses, thus curriculum was consistent across the different sections of university classes regardless of delivery format.

Data Sources and Analysis

Focus group. We used a virtual version of focus groups rather than the traditional in-person focus group (to be described further) with graduate students in each setting in order for them to reflect on how collaborative technology supports them to collaborate and learn research methods. For some people, focus groups provide a safer and more supportive atmosphere than the individual interview and are traditionally used to gather in-depth information from participants who share commonalities (Porter, 2012; Steward & Shamdasani in Parker & Tritter, 2007). Focus groups collect the most data when compared to other face-to-face methods. They are cost efficient (Parker & Tritter, 2007), as was the case for us, given the geographic distance between sites. Our insights on adapting a focus group to a virtual format are shared in the discussion of focus group findings.

We conducted one hour audio-recorded virtual focus groups using Skype with video for a total of two hours. A standardized protocol with 13 open-ended questions and probes was created. Questions included: "Can you recall when you first began to use computers? How, if at all, do you use social media…? In what ways have you collaborated with other students in the class? Reflecting on your experience in this course, what would you do differently to improve your learning?"

Scheduling the focus groups entailed consideration of different international time zones and ensuring appropriate technology was available. Although we have extensive experience conducting focus groups, this was our first experience using a synchronous virtual format (Stewart & Williams, 2005). It meant we had to rethink our interview approach and how to observe participants (Garcia, Standlee, Bechkoff, & Cui, 2009; Nicholas et al., 2010).

In focus groups, facilitation of discussion is essential to ensure a successful group interaction and data collection; this is especially challenging virtually. The researcher becomes the facilitator and at times is accompanied by another individual or "observer" to assist in recording data, such as non-verbal gestures (Parker & Tritter, 2007), as we did. The virtual format required having a support person present on site with the group (i.e., an instructor) to manage logistics while the researcher conducting the interview was in a different location, on Skype. The support person was responsible for making room arrangements and having a computer with Skype set up by the start of the interview. We assigned this person the role of common ground holder. Chairs for participants were arranged in a semi-circle around the computer screen to simulate the traditional group interview setting of sitting in a circle or at a table.

Informed consent was obtained in writing with help from the onsite instructor. Interviews were digitally recorded with permission and later transcribed. The onsite instructor provided a paper copy of the questions for students. Although all instruction at MU is in English, we thought it was important for them to have the protocol. We used a round robin interview approach to allow each student the opportunity to respond to all questions and varied the order of students The researcher-facilitator encouraged participants to

share their views. There was some spontaneity in student responses (i.e., out of order).

For focus groups, data analysis entailed reading transcripts and coding for central concepts, first within and second across cases (sites) in order to identify themes and patterns (Miles, Huberman, & Saldana, 2014; Saldana, 2013). The focus groups captured rich and thick descriptive responses. For validity, researchers independently coded the transcripts, followed by data triangulation. We began with open coding and after discussion created a master code list for a total of three cycles of coding and refining codes.

Survey. We administered a ten-minute internet-based survey that measured computer self-efficacy (Torkzadeh & Koufteros, 1994). We also collected demographic information on gender, age, and location. The Likert-type survey was disseminated using Snap Survey Software. The original computer self-efficacy survey had four sub-scales: *Computer Beginning Skills* (CB), *Computer Advanced Skills* (CA), *Computer File and Software Skills* (CFS) and *Main Frame Skills* (MF). To meet the needs of the current study, we modified the language of some items in the original scale (e.g., instead of using "floppy disk," we used "flash drive / thumb drive"). Additionally, we replaced Main Frame Skills with a *Computer Research Skills* (CR) section for appropriateness. This subscale included items that referred to the perceived ability to share and utilize digital information for research purposes. The *Revised Computer Self-Efficacy Survey* had 28 Likert-type items.

Students were asked to rank their level of agreement or disagreement on statements regarding (e.g., "Using the computer to write a research paper, literature review or a critique" (CB), "Accessing electronic databases," and "Using spreadsheets (e.g. Excel, SPSS) for data management and analysis" (CR)). Scores range from1 (strongly disagree) to 5 (strongly agree).

Internal reliability coefficients from the pilot study yielded alpha coefficients of .96 (Beginning skills), .90 (File and Software), .92 (Advanced Skills) and .87 (Research Skills). For validation purposes, before using the instrument, three faculty members provided feedback regarding appropriateness and clarity of the instrument. For survey data analysis, given the small sample size, analysis was limited to descriptive statistics and comparisons across groups.

Document analysis. We conducted a document analysis of course syllabi using a document summary protocol to help determine how, if at all, technology and collaboration were incorporated into the research methods courses. We were interested in the ways collaboration was infused in the curriculum, as reflected in the syllabus, for example requiring students to collaborate with each other beyond the classroom on a group research project, and, specifically, how collaborative technology was infused, such as an expectation to join an online group meeting. We recognize that a syllabus may not represent what actually occurs in the class (e.g., there may be more or less requirements at the discretion of the instructor, there may be unintended changes due to a host of reasons, there could be spontaneous collaboration not outlined on the syllabus, and so forth); however, it can be thought of as a learning contract between the instructor and student. The document analysis was used to extend and corroborate or contradict how students experienced the course as expressed in focus groups.

Delimitations and limitations. The study is delimited to graduate education students enrolled in required introductory research methods classes at two universities. Study limitations include a small sample and no observations. Findings, however, may apply to similar graduate settings.

Results

Focus Group Findings

Virtual focus groups were conducted to understand how collaborative technology supports these students to learn research methods. We interviewed 18:43 graduate students (n=18) who had completed the survey (Six in KV, 12 in FL). We discuss four findings from our within and cross site analyses. Representative statements were selected to capture the meaning and spirit of the findings in the voices of students. We close by sharing what we learned about using virtual focus groups.

The methods course evokes emotion. Across borders, enrolling in a required introductory graduate level research methods course evoked positive and negative emotions in these students. Although we did not ask about emotions, when responding to a question about their expectations for the course and throughout the interviews, students (6:6 from Klang Valley and 7:12 from Florida) readily expressed their emotions about the learning experience. These ranged from having no anxiety to a little apprehension, to excitement, and to feeling considerable anxiety and fear.

For example, a student in Klang Valley told us, "This is my first research course. I'm pretty excited and interested in carrying out research studies," and another said, "I'm actually anxious at the same time I'm also very excited…" In Florida, a student said, "[I] expected to hate it because research in my mind is tedious." A classmate agreed, stating she hates statistics and worried, "[I] was going to do really bad because I'm bad at math." Yet another Florida student reflected how her feelings about the course changed over time and that she "would definitely tell students

not to panic because I panicked on every assignment and ended up doing well."

Graduate students experienced with computers and internet. Whereas some students had no prior coursework in research methodology, all participants said that they entered the classes having had prior experience using computers and the internet. They were familiar and comfortable with technology. Given the wide age range of students (21 to 55), it is not surprising that some reported being introduced to computers as early as pre-school and others as late as on the job after graduation from college; regardless, no one expressed anxiety over using technology in the methods course.

All students used e-mail. Social media for personal use was very popular across groups. Facebook was specifically mentioned by 5:6 Malaysian and 9:12 US students. Additionally, students said they used Yahoo Groups, Google Groups, blogs, Twitter, Yahoo Messenger, chat rooms, and Skype. In stark contrast, a single student in Florida stressed that she is "anti-technology" and shuns social media. Like her peers in Florida and Klang Valley, however, she has the capacity to use technology and the internet for learning research methods.

Mixed use of technology for collaboration. Primarily students at one site worked together with the support of collaborative technology to learn research methods. When asked, "Did you collaborate with other students in the class, and if so, in what ways did you collaborate?," all six from the Malaysian university and a minority (2:12) in Florida said that they discussed and shared course information with classmates to assist learning. A collaborative learning environment was prominent in the view of KL students, yet notably, interactions occurred mostly outside the classroom and were not built into the curriculum.

Based on document analysis, we identified technology-related activities in all course syllabi at both sites. This included preparing and submitting electronic assignments, accessing the web for academic searches, use of electronic databases, and communication, along with availability of an online learning platform such as Blackboard. According to what students said in the focus groups and confirmed by reviewing course syllabi, however, there were no group assignments or projects requiring students to collaborate. Also, no one mentioned in-class learning activities that required them to reflect and interact with peers, nor was this indicated in the syllabi.

Students in the Florida focus group who said that they collaborated, used technology to support this interaction. They connected to each other in various ways including e-mail, text messaging, and the telephone. One student said that she collaborates "…via text messaging panicking about if I was doing stuff right to a number of people, 'Is it right?' or 'Is it going to be that?' I'm very shaky towards research. I don't feel confident in it, so I definitely asked for advice." Yet most students participating in Florida did not have much to say about collaborating: "I didn't really collaborate with anyone outside of the class, but in the class I would see that everybody was not knowing what to do like me, and I felt a little bit more at ease knowing that everybody else was having these questions about how to proceed as I was." She summed up, "There was not much collaboration outside the class." Or inside for these students.

Students in this group were more apt to use e-mail to contact the professor directly (8:12) regarding a question than go to their peers (2:12). No student mentioned using a discussion board or group chat room even though those were available to them via the course online platform.

In contrast to the Florida focus group, students in Klang Valley regularly engaged with each other to extend learning outside of class. This occurred even though it was not expected, according to a review of the syllabus. A student's comment captures their collective learning experience:

> I collaborated with other students by taking part in discussions, sharing ideas and information through phone, sms, internet and, of course, it really helps me a lot ... My friend helped me, told me how to use SPSS, and now I'm really good at it.

Students reported benefitting from a number of different collaborative technology options, as outlined earlier.

Students in Klang Valley made a point about using not only technology to connect to other students, but also engaging in face-to-face meetings outside of class. A student said, "We get together before class begins, we discuss something, share the knowledge, whatever we gained the previous night. At break time and after the class also, we always share and do discussion and find … information for our research."

Students need preparation to access online literature and data sources. A gap in preparation on how to access literature and data sources using today's technology was identified by students in both focus groups. A concern about utilizing the "new library" was voiced by 6:6 in Klang Valley and 11:12 in Florida. The following was a typical comment from the KL focus group:

> …[T]he big challenge for me is to find more material on the research topic. Okay, my challenge is the library is quite far. I'm staying quite far from the university and we have limited materials on the topic…I have to know more technology that I can use to help me find more materials.

Similarly, a graduate student in Florida remarked:

> I wish I had more access to more scholarly publications, articles out there because I know there are tons more out there. I am sure there is a way but I personally can't, so I felt that I was slightly limited in what I could access and I wish I could have gotten more.

In contrast, one student in Florida declared, "I don't have a problem accessing articles at all…"

Insights on virtual focus group technique. While focus groups are used and written about extensively, little information is provided on the process itself (Massey, 2011). Our process involved a common ground holder on site and a virtual facilitator. The common ground holder managed the classroom space while the facilitator set the tone for an emerging synergy. It was advantageous that the facilitator and students could see and hear each other at all times and that no technical problems were encountered.

We exclusively employed the round robin questioning technique to ensure each student could contribute and to assist with facilitation over Skype. In varying order, students took turns answering a question and could pass, but no one did. Students expanded on what others said and directly made references to previous statements. There was, however, much less cross talk than what we have experienced in traditional face-to-face focus groups. We were able to obtain their shared group opinions, for example that the course evoked emotions, and shared beliefs, for example that they were technologically proficient. Yet perhaps more than technology this questioning technique may have diminished synergy across participants, a distinct advantage of focus groups. For future virtual focus groups we recommend planning time for spontaneous responses to questions.

Hydén and Bülow (2003) suggested that focus group participants can constitute themselves in different ways as talking individuals. One way is as a group talking together (a group), and another is as individuals that are not a group (an individual). Individuals must share some set of values and common ground experiences if they are to interact as a group. We noted that the students at both sites shifted between the two modes of interacting while sharing common ground as graduate education students taking the same course. Students in KL appeared to talk more as a group than their counterparts in FL.

Survey Results

A survey was used to establish the graduate students' computer self-efficacy**.** We report the descriptive statistics and comparison across groups of students at the two universities enrolled in required introductory research methodology courses.

Measures of central tendency were computerized to summarize data for the computer self-efficacy (CSE) subscales. Measures of dispersion were calculated to understand the variability of scores for CSE subscales. The following are the results of this analysis. The Computer Beginning Skills (CB) average score for the 42 participants was 4.50 (*SD*= .74) across groups, the *Computer File and Software Skills* (CFS) mean was 4.27 (*SD* = .82), and the means for *Computer Advanced Skills* (CA) and *Computer Research Skills* (CR) were as follows: *M* = 4, *SD* = .83 and M = 4.16, *SD* = .78, respectively (See Table 1). Females reported to have stronger overall computer self-efficacy skills (*M*= 4.30, *SD* = 78) than males (*M* = 4.17, *SD* =.56). In terms of location, Malaysian students' scores (*M* = 4.43, *SD* = .37) were higher than the American students' scores (*M* = 4.14, *SD* = .87) (See Table 2). Most of the students (95%) in the Malaysian group were between 35 and 44 years old. More than half of the students (52%) in the American group were between 25 and 34 years old.

Overall, it appears that most students in both locations reported feeling strongly efficacious regarding computer skills and use. Interestingly, Malaysian women were reported to have the highest score in computer self-efficacy (*M* = 4.57, *SD* = 2.85).

Discussion

Our study explored how collaborative technology was applied to support student collaboration and learning in the context of a graduate education required introductory research methods course. We discuss our five findings next.

These graduate students considered themselves adept and comfortable using computer technology. They perceived that they had the ability to use computer applications to complete assignments, perform academic tasks, and seek digital information. Using technology was not a significant barrier for these adult learners. For them, the learning curve was how to use technology for research purposes and how it could assist their learning. Courses at the two universities, according to our review of the syllabi and students at the focus groups, did not require collaborative learning activities. There were no small group exercises or team research projects, for example, thus it is not surprising that with or without technology some students said they never collaborated with others (either in or out of class) to improve learning. An interesting finding in this study was that these female students in Klang Valley reported higher computer self-efficacy beliefs than males, which was not supported by literature of gender differences in computer self-efficacy (Ates, 2011; Wong et al., 2012). It may be that this small group of female graduate

Table 1
Means and Standard Deviation of the Computer Self-efficacy Scales Across Sites

	Across Sites	
CSE Subscales	Mean	SD
CB	4.50	.74
CFS	4.27	.82
CA	4	.83
CR	4.16	.78

Table 2
Means and Standard Deviation of the Overall Computer Self-efficacy Between Sites

	Mean	*SD*
Klang Valley	4.43	.37
Florida	4.14	.87

students is an outlier, or perhaps computer self-efficacy gender differences are diminishing. Further research is needed in this area.

Students who interacted with peers to reflect on their experiences and to discuss what they were learning found it to be beneficial, consistent with a constructivist approach to learning research methods (Vygotsky, 1978). Yet the level and depth of interaction varied across sites. Students from KL engaged in discussions about learning while for other students, particularly in FL, the exchanges were simply about verifying if something was being done "right" or confirming assignments. Although the latter type of communication may not have advanced learning, it may have helped a student to cope with negative emotions associated with the methods course (e.g., to alleviate anxiety over an assignment).

These students in Klang Valley routinely engaged with each other outside of class to improve learning, contrary to the Florida students. This took place based on their own volition (i.e., it was not a course requirement or expectation). During the focus groups, KL students appeared to talk more as a group than their counterparts in FL, perhaps because of their greater engagement through collaboration and cultural tendencies. These findings suggest that students in Klang Valley and Florida may fall into Hofstede's cultural dimensions of collectivism and individualism when discussing differences in eastern and western cultures (Hofstede, 2001; Yoo, 2014); however, we are cautious to make any generalization. Collectivism refers to the degree to which individuals are integrated into groups and look after each other within a group. Individualism refers to societies in which ties among individuals are loose, and they look after themselves and their immediate family (Hofstede, 2001).

Students primarily connected with each other in two ways: by using collaborative technology outside of class and meeting face-to-face immediately before or after class. Regarding anything class related, those who connected used popular collaborative technologies like Yahoo Groups, Google Groups, chat rooms, and Skype, whereas social media, including Face Book, were primarily for personal use. Previous research (Alloway, Horton, Alloway, & Dawson, 2013; Junco, 2011) found a negative relationship between use of social networks (e.g. excessive time devoted to personal use) and academic achievement; however, that was not supported in our study.

These students found accessing scholarly information and databases to be especially challenging, signaling that this technical skill set needs attention in the methods curriculum. They preferred using internet searches to obtain information rather than more complex library resources to support their research. As they recognized, this diminished their ability to retrieve information for academic purposes. The way these students used electronic databases was similar to previous research (Blummer et al., 2013, Catalano, 2010; Earp, 2008). Given that the students were enrolled in introductory methods courses, there may be plans in place for them to acquire the requisite skills later in the programs.

For these graduate students, emotions were integral to their personal experiences of learning research methods. Across sites and unsolicited, students talked about how they felt and took time to describe their emotions as learners. As students anticipated the class, actually encountered it, and looked back on challenges along the way, they described an experience colored by positive and negative feelings. This finding corresponds with previous research identifying

students' anxiety and uneasiness when taking a research methods course (Braguglia & Jackson, 2012; Deem & Lucas, 2006) and has implications for faculty responsible for teaching the courses.

Finally, we wonder if there would be other learnings if a different virtual focus group process was used, such as allowing participants to speak in no particular order, and having more time. Limitations of the virtual approach include choice of available technology, access to appropriate personnel at the study site, and challenges of virtual facilitation to foster rapport and synergy among participants.

Recommendations

Recommendations for Practice

Recommendations are as follows:

1. Faculty are encouraged to consider incorporating a constructivist approach to teaching research methods supported by collaborative technology. Graduate students are well positioned to engage in experiential learning activities like team research projects and to apply collaborative technology to interact with peers on assignments.
2. We urge faculty to provide opportunities for students to talk safely about what they are learning: for example, create study groups and virtual discussion forums. Communicating with classmates about challenging learning experiences may help students to cope with negative emotions, like fear and anxiety, associated with research methods courses.
3. It is essential that universities ensure that the technology infrastructure has support systems to meet adult learner needs and to support their continuous learning.
4. Faculty are advised to review programs to insure graduate students are introduced to the modern library and new media resources. This could be part of orientation, a topic of special workshops (online or face-to-face. mandatory or voluntary), and/or an incorporation into introductory research methods classes.

Recommendations for Future Research

Recommendations for future research are offered:

1. We recommend studying research methods classes, virtual and face-to-face, to gain a better understanding of how students of different generations learn and how collaborative technology supports their learning. Also, it would be important to consider cross cultural contexts when studying learning experiences across different countries, such as how gender and cultural norms influence learning, as well as considering the implications of cross-cultural differences within the university settings.
2. There remains a need for research on curriculum and instruction of research methods, specifically course structure and use of collaborative technology. We recommend future research to see how infusing collaborative technology in the curriculum—in conjunction with assignments that require collaboration, discussion and reflection—improves learning research methods. Specifically, it would be useful to know if there were quantifiable gains (such as final course grade) and qualitative gains (such as confidence in analyzing research) when students engage in a constructivist learning environment and use collaborative technology in contrast to those who do not.
3. We recommend expanding the pilot survey sample to groups that are matched by major.
4. Virtual focus groups offer a convenient and economical way to conduct interviews that might not otherwise be possible. More research is needed to examine strengths, weaknesses, and cultural aspects. For future focus groups we suggest opening with a round robin approach but to not be confined by this.

Conclusions

Our study shows not just what we can gain from a partnership between universities but has implications for graduate programs and the faculty responsible for teaching research methods. Collaborative technology to support students when learning research methods may be an underutilized resource. The small group of students who were informally using collaborative technology to connect with their peers and seek information considered it advantageous to their learning experiences, yet this was not part of the formal curriculum and may have been helpful to others as well. Today, higher education faculty will need to adapt their curricula to the new technologies available and eventually to teaching students who are digital natives.

We examined introductory research methods classes and found that they relied on traditional teacher-centered teaching methods (lecture and independent student work). Yet students may benefit from a learning environment (physical and virtual) where they actually work on a class research project and have opportunities to reflect, share work, discuss, and

collaborate with each other in constructing knowledge. This could be accomplished, in part, with the assistance of collaborative technology.

Students may enter graduate programs today with a solid foundation of computer experiences and arrive confident about their capability to use technology, as we found, yet they will need university support to learn applications to research and to advance their skills and use of complex databases.

Finally, these graduate students disclosed how taking a required research methods course triggered a range of emotions, encompassing anxiety, panic, and fear for some. It is important that faculty be aware of the emotions associated with learning research methods and that they support students in harnessing their emotions for a quality learning experience.

Tapping into graduate students' comfort with collaborative technology and their already strong academic motivation has the potential to enrich their learning experiences. Creating opportunities in the curriculum for students to reflect and engage with the help of collaborative technology can be an important source of student support and development. Significantly, students may become more active participants in shaping their own learning. Improving approaches to teaching research methods may help prepare graduate education students to become quality researchers and discerning consumers of research as practitioners and policymakers, thereby contributing to a better education for current and future generations.

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