Supporting Undergraduate University Students through Instrumental Mentoring

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Supporting Undergraduate University Students Through Instrumental Mentoring

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Abstract: Student engagement and retention is a noted concern for universities and may be impacted by many different student factors such as difficulty transitioning to a university setting, inadequate skills or a sense of isolation. This study evaluated an instrumental mentoring program conducted at an Australian University in a program for pre service teachers. Twenty four undergraduate students were engaged as volunteer research assistants and worked with seven academic staff in meaningful writing and research tasks. Qualitative data was collected through focus groups, student journals, and follow up interviews. The data was analysed thematically. Results indicated that through their participation, students experienced and sustained an improved sense of belonging with more understanding and confidence regarding their academic writing and research skills. Implications for program practice, limitations, and future research directions are discussed.

Keywords: mentoring, instrumental mentoring, student retention, university student support

Introduction

Maintaining a high level of student engagement and retention is often a concern for universities (Marcus, Hughes, McElroy, & Wyatt, 2010; Morisano, Hirsh, Peterson, Pihl, & Shore, 2010; Wilson, 2012). Research suggests that students who have a sense of belongingness, or the feeling of being a part of a community are more likely to effectively engage in their course (Bowles, & Brindle, 2017) and this engagement may foster greater retention of students. The staff of the Australian university involved in this study also noted anecdotally that difficulties with academic writing can sometimes be a significant barrier to academic success overall among undergraduate students and could result in discouragement and demotivation. Although academic staff want to support their students and develop constructive working relationships with them, it is sometimes difficult to balance students' needs with academics' busy schedules

and the often competing priorities of teaching and research. In an attempt to work within these constraints, a group of eight academic staff within a School of Education developed and implemented an instrumental mentoring program for undergraduate students. The purpose of this program was to develop students' writing skills and create a learning community of students and academics who would work collaboratively on authentic academic writing and research tasks.

The study aimed to investigate whether academics engaging in meaningful research tasks with undergraduate students provide benefits for students. Moreover, are student/academic working relationships impacted positively with students increasing their level of skills and confidence in academic writing? This article describes the instrumental mentoring program put in place in the School of Education in one Australian university. It includes the theoretical rationale for the program and a review of the relevant literature. It also provides an analysis of the data collected as part of the research arm of the project, a discussion of the findings of the study and the implications of these findings for undergraduate learning, engagement and retention.

Theoretical Rationale

Consistent with the concepts of self-determination theory (Ryan & Deci, 2000) and social learning theory (Bandura, 1977) this project strived to develop mentored relationships to undergraduate students through the development of a community of researchers made up of academic staff and students. Self-determination theory (SDT), according to Ryan and Deci (2000), holds that human beings have innate psychological needs which go beyond basic physiological needs such as food and shelter. Specifically, human beings require a feeling of competence, relatedness, and autonomy and will engage in goal directed activities which result in the fulfillment of these needs. The attainment of a person's basic needs is related, according to the tenets of SDT, to the development of intrinsic motivation. Further, extrinsic rewards such as assignment of marks as well as constraints or punishers, including deadlines or evaluations could diminish an individual's intrinsic motivation. Therefore, this activity which focuses on engagement for the purpose of development of skills and which sees all members of the group as equally valuable could support the intrinsic motivation of students to engage not only in these specific activities, but their overall academic engagement.

According to social learning theory (Bandura, 1977), the process of identificatory learning takes place through the informal observation of competent models. As human beings, we learn the acceptable language, patterns of behavior, and interactions through watching others in our environment. University is a new environment with different norms and expected behaviors which students must learn. Providing students who are fairly new to university with competent models of these appropriate behaviors, particularly in an environment which is supportive and non-evaluative could help to accelerate their learning.

Bandura (1977) also emphasizes the importance of the relationship between human agency for an individual's own actions and the development of self-efficacy or belief in one's abilities. As learners, students are invested with the agency to decide what actions they wish to take, what behaviors they will display and what choices they will make, which are influenced by their self-efficacy. In other words, if a student believes they have the ability to learn material or complete a task, they are more likely to persist even though the work is hard.

Further, both the belief in one's skill and the action precipitated by that belief is important (Bandura, 1977). Not only is a person's motivation to try harder activated, but physiological changes, such as the release of stress hormones, may be impacted by a person's perception of control. For instance, if a student feels they do not have the ability to gain needed skills for success in their studies, their stress level rises, impeding their cognitive processes. Further, humans are able to learn through the actions of others, both directly and vicariously. If we witness someone else being successful at a task, we are more likely to believe that we can also be successful. In this project, students have the opportunity to learn through their interactions with other students and research academics and observing mentors and peers who are positive models for the skills they want to attain. Through the day to day activities, the students witness both the successful completion of writing and research tasks and the writing process which often includes mistakes, change in strategies, and the need for overall persistence.

Literature Review

There is much research which focuses on the need to support university students in their transition from secondary environments to becoming academically literate including the positive effect this type of support may have on student outcomes. The benefits of providing structured courses which focus on developing students' metacognitive skills have been demonstrated by Dowd, Roy, Thompson and Reynolds (2015), amongst others. Their study took place over several years, in a course which allowed students to review each other's work, interact with peers, reflect on their understandings of scientific reasoning in writing and utilise higher order critical thinking skills. The benefits of these types of courses in supporting students new to academia have been reported by other researchers (Frantz et al, 2017; Gopee & Dean, 2013; Kardash, 2000). Two main areas of support have been identified by Gopee and Dean (2013), 'institutional' and 'non-institutional'. Institutional support may include one on one writing tutorials offered by writing support departments or support from subject tutors. Advice given in these forms can increase student motivation and time spent on producing assessments as well as foster improved writing practices. Non-institutional support is derived from students' course peers, their friends and any acquaintances who can be trusted to be critical friends in writing. Sometimes non-institutional academic writing can be carried out through social collaboration and result in the building of a writing community (Gopee & Dean, 2013) creating an informal curriculum in which peers share their understandings of the course requirements, marker expectations and writing conventions. Students' perceptions of this support have been under reported as has research on what students feel they need in order to succeed in their first years at university (Gopee & Dean, 2013).

In a study which sought to ascertain what strategies university students needed as writers in health or social care courses and the pressures and demands upon them to perform, Gopee and Dean (2013) found that certain students really struggle with academic writing if they do not receive tuition on how to write either from an institutional or non-institutional source. In particular, the early provision of opportunities for undergraduate students to be involved in a research experience has been said to improve students' confidence, curiosity, independent learning skills, retention, graduation, grades, research and communication skills, creativity and science related skills (Frantz et al, 2017). More experienced peers such as graduate student

mentors have also been effective in supporting undergraduate students' writing skills (Douglass, Smith & Smith, 2013). Specifically, mentees identified mentor characteristics such as good communication and writing skills as being important. Interestingly, mentors who participated in the study felt their role of social and emotional support was very important, whereas the undergraduate mentees were more focused on academic outcomes.

The current project sought to combine these identified characteristics which could support undergraduate students particularly as they transition into the university community. Specifically, we sought to provide practical support for the study skills needed to be successful as well as providing the social and emotional support that may be provided by being a member of an academic learning community. However, we took the novel approach of providing both types of support through experiential learning experiences rather than formal tutorial sessions. This study reports on our efforts to understand the experiences and perceptions of undergraduate mentee participants as they participated in these experiential activities based around academic writing.

Student Belongingness

In their work on student retention and well- being in universities (especially in first year undergraduate courses), Bowles and Brindle (2017) explored the concept of student 'belongingness' alongside their focus on gender and minority group membership (Allen & Bowles, 2012; O'Brien & Bowles, 2013). This aligns with the basic need for relatedness as described in the concepts of self-determination theory (Ryan & Deci, 2000). Bowles and colleagues defined belongingness in an education setting as a feeling of being part of the institution and identifying with the educational culture, goals and student-teacher relationships of that institution (Allen & Bowles, 2012; O'Brien & Bowles, 2013). An increased sense of belongingness, they found, had a positive effect on student psychological functioning, academic outcomes, student motivation and well-being, including relationships with academic peers and greater campus involvement. Collings, Swanson and Watkins (2014) also explored links between student wellbeing, integration and retention and peer-mentoring. Investigating the direct, mediated and moderated effects of peer mentoring on a group of students, they found that the mentored students displayed high levels of university integration. Those without a peer mentoring experience, on the other hand, were four times as likely to seriously consider leaving the university. Academic mentors also report feeling the 'bonding' experience as important, describing their mentoring experiences as 'rewarding' and satisfying (Dobie, Smith & Robins, 2010). Similarly, Beltman and Schaeben (2012) found that university peer mentors received benefits across several areas as a result of their mentoring experience. In the present study we aimed to provide a learning environment where students could connect with each other and with academic mentors to strengthen their skills as well as their sense of belonging to the university community.

Academics as Mentors

Just as student retention is difficult to define, mentoring research has struggled with finding a consistent definition and conceptualisation of what it means to be a 'mentor' in

education settings (Crisp & Cruz, 2009). Jacobi (1991) identified three points of agreement about mentoring. First of all, mentoring relationships are focused on growth and achievement of an individual and include assistance from the mentor to the mentee. Secondly, mentoring can involve professional and career development, role modelling and psychological support. Thirdly, mentoring relationships are personal and reciprocal. As Haggard, Dougherty, Turban and Wilbanks (2011) indicate, mentoring relationships are reciprocal, with both mentee and mentor benefitting. Mentoring has also been defined in terms of career or psychosocial functions (Kram & Issabella, 1985). Career functions support both mentees' and mentors' advancement while psychosocial functions can help mentors and mentees gain a sense of competence and self-image. Studies have shown that mentors in education can experience personal growth, satisfaction and participation in a learning community (Beltman & Schaeban, 2012; Dobie et al., 2010). They often value the connections with students, the successes of the students and the roles they see played out by other university mentors. They can feel challenged as well as finding the mentoring a fun experience (Dobie et al., 2010). Mentoring programs in higher education settings have been found to have benefits for students who require academic support, as well as those from underrepresented groups (Beltman, Samani, & Ala'i, 2017). For example, a number of mentoring programs have been used to support Australian Indigenous university students (Beltman et al., 2017; Mills et al, 2014). In a survey of mentoring programs in Australian universities that targeted students from underrepresented groups, most mentoring programs focused on engagement at the beginning of courses, while others aimed at raising aspirations of prospective students and others focused on the transition to careers after university (Beltman et al., 2017). Mentors in the programs included peers further along in the course, academic staff, university alumni and community mentors with a specific background such as a professional career. Programs that were examined in detail aligned well with established benchmarks for mentoring programs in general (ANZSSA, 2015; AYMN, 2012). The benchmarks include very detailed indicators that align with positive outcomes for all program participants such as the need for a coordinator to provide support for mentors as well as mentees.

Mentoring of university students has been shown to have positive effects on student retention and satisfaction (Morales, Grineski, & Collins, 2017), as well as increasing critical thinking skills, and improving student self-confidence and aspirations (Schneider, Bickel, & Morrison-Shetlar, 2015). Research also suggests that instrumental mentoring programs, mentoring programs with a specific focus, are most effective for adolescents and post adolescents such as university students because the students feel a purpose for the meetings and are more likely to be motivated to fit the activities into their busy schedule (Karcher & Nakkula, 2010). The students see a very close connection between their involvement in the activities and acquiring useful skills and knowledge. Further, undergraduates who have opportunities to participate in authentic research projects demonstrate a higher level of understanding and interests in scientific research (Harvey, Wall, Luckey, Langer & Leinwand, 2014).

The activities in this study were authentic and purposeful. The mentee participants were treated as colleagues and included in authentic research activities such as conversations around project development, research method decisions, as well as more prescriptive activities such as data analysis, coding, and proofing of manuscripts. The conversations were bi-directional; mentees were provided with direction and feedback, but the academic mentors also asked their opinions and acted upon their input if it was warranted. The purpose of this study is to understand the experiences of the undergraduate mentees in these authentic academic research

and writing activities. Specifically, we wanted to know if their involvement had an effect on perceived university belongingness as well as confidence in skill development such as academic writing and understanding of academic research.

Methodology

This project was an ethnographic case study, as it focused on an "in-depth exploration" of a specific 'case' (Creswell, 2005, p. 439), with the purpose, in this study, of understanding how student interaction with staff through an instrumental mentoring program would impact their university experience. This type of qualitative study is appropriate to understand not only the impact of the mentoring experience on each individual, but also how interactions within the group may change the students' perceptions about themselves as students and future educators. Consistent with the characteristic of case studies, we collected multiple forms of data over time in order to provide a deep understanding of the mentoring project (Creswell, 2005).

Ethics

Before beginning the project, all information was presented to the University Office of Research Integrity. Ethical approval was granted and care was taken respect the rights of all participants. Particularly because the participants were university students, it was important to guard against conflicts between staff and students. The project was completed outside of the regular semester and therefore, none of the project activities impacted student marks or enrollment in any manner.

Procedures

Current accepted best practices for mentoring programs are recognised as those informed by current research as outlined in *The Elements of Effective Practice for Mentoring* (Garringer, Kupersmidt, Rhodes, Stelter, & Tai, 2015). High quality mentoring programs generally adhere to these recommendations across six distinct elements: Recruitment, Screening, Training, Matching and Initiating, Monitoring and Supporting, and Closure. The design and execution of the current project was framed by these standards.

Participant Characteristics and Recruitment

Participants for the project were undergraduate students enrolled in the School of Education at an Australian University. For the purpose of recruitment, emails describing the project were sent to academic staff in the School of Education, asking them to post a description of the project on their unit Blackboard sites. The project leader also presented details about the project at a staff meeting and asked staff to contact specific students that they thought might be interested in the project. Further, brief presentations were made directly to students regarding the project, primarily in first year units. Students were required to submit an application by email to

the project leader with a short essay (250 words or less) explaining why they should be accepted into the program. A total of 19 undergraduate students were recruited for this project including: first year (n=11), second year (n=1), and third year (n=7) students. The majority of the students were typical university age (~18 to 24 years) however, 5 of the participants were mature age students. Acceptance was not related to a specific level of academic ability, but rather the student's demonstrated level of commitment to the project. The academic achievement level varied from high achieving students to at least one student who was on academic probation. The recruitment information focused on the commitment and potential of the students, rather than current achievement. In addition, 5 post graduate students, 2 master's level and 3 PhD students took part. The postgraduate students were considered assistants to the staff, rather than participants. All data reported in this paper refer only to the undergraduate students.

Project Structure and Activities

After the participants were identified, two informational meetings were held. The purpose of these meetings was to allow opportunities for the academic mentors and mentees to become acquainted with each other as well as the project activities and expectations. Each of the academic mentors gave short (~10 minute) presentations describing their research projects which the undergraduate mentees would have opportunities to be involved in, with time included for mentee questions. Coffee, tea and snacks were served and engaging 'ice breaker' activities were included.

The main activities of the project took place across a two week period just before the beginning of the semester. A dedicated room was procured with at least two of the seven involved academic staff in attendance most times across the two weeks. To provide maximum flexibility for both mentors and mentees, the room was staffed by mentors for approximately 60 hours, and successful completion of the program for mentees was defined as active attendance for 30 hours across the two weeks. The students were given the agency to choose which research projects they worked on, and work took place in teams, small groups, or individually. The mentor/mentee matching was not prescriptive, rather naturalistic through the activities with the relationships developing across the two weeks. Examples of activities included: literature review searches, article summaries, data coding, interview transcription, entering data into SPSS, discussions around project development and data analysis methods.

Change with beginnings and endings is a hallmark of life and rituals to mark the changes are important. One of the implicit goals of this project was the continuation of the mentoring relationships beyond the two week period of structured activities. To these ends, we arranged events on the final day to affirm participant contributions and understand the experience from the point of view of the mentors and mentees, gather feedback to improve the project going forward and continue to support the developing relationships.

The final day of the project included a luncheon with a formal ceremony to recognize the contributions of all mentors and mentees. The students who successfully completed the requirements of the project (30 hours attendance) received credit for their time logged as volunteer service hours to the university, and were presented with a formal Certificate of Completion. After the luncheon, focus groups were held in small groups of 4 or 5 mentees. Besides providing valuable data regarding the project, this was a reflective time for the mentees to consider their experiences and to consider their options going forward - in many cases to

continue the relationships and their involvement in the research projects they were working on. Most all of the mentees were enthusiastic about their experience, and were positive about involvement in future projects.

Data Sources and Data Analysis

Qualitative data were collected through multiple sources and over a period of time. This allowed us to better understand both the changes and the change process. The data sources included journal entries completed by the students throughout the event, focus groups conducted on the final day of the event and follow up questions through email or telephone calls two full semesters after the event, approximately 10 months after the student's participation. In this section we will outline the analysis of each of the data sources and the emerging themes. In the results section, because we found similarities in the themes across the data sources, we will present the common themes.

Journal Entries.

During the two weeks of the program, students were provided journals numerically coded without names and encouraged to complete unrestricted, free writing entries each day that they attended. While all of the interns made some journal entries, about half (n= 9) completed entries each day. The journal entries were unrestricted, free writing providing an invaluable window into patterns of change in the students' thinking across the two weeks. Some entries discussed the activities of each day, including technical, detailed notes such as coding methods, how to use particular software, or methods to search library databases. Other entries included the thoughts, both positive and negative of the participants. The journal entries were analysed using axial coding techniques, a process of identifying the different themes or categories in the data to understand how each links or relates to the other (Simmons, 2018). This is an appropriate method to understand the valid participant insights emerging through their voices.

The journal entries were transcribed from the handwritten journals into a typed word document for ease of reading. Three researchers participated in the analysis, following these steps: First, each researcher read the transcribed entries independently being careful to maintain an objective lens. Second, each reread the data, making notes or memos on the transcriptions. Third, the researchers again reread the data, and using their previous notes, developed themes from the commonalities noticed across the entries. At this point, the three researchers came together, with each in turn presenting to the group their individual themes developed from the multiple readings. Through discussion of the similarities and differences of their findings, the group came to a consensus of three broad emergent themes, which spoke to the different areas of change identified as areas of importance for the participants. The first theme was growth, relating specifically to areas of personal growth or feelings of self-efficacy. The second theme identified was skill development, which dealt with areas such as professional development for both their life as a current student and for their future professional life. Finally, we noticed the third theme of connectedness, which concerns relationships with other students, lecturers, and the university environment. One overarching point that all three researchers agreed upon was the process of

change and development of the participants was evidenced through the journal entries across the two week period, in all areas including a growing confidence in themselves, their skills, and their relationships with others in the group.

Focus Groups.

On the final day of the event, four semi structured focus group interviews were conducted simultaneously as one of the closing/celebratory activities. Led by four of the academic staff, the same guided questions were used for each group. The interviews were audio recorded and transcribed for analysis. An inductive (emergent) design (Saldana, 2008) was chosen for the focus group data analysis process. This allowed the data to speak for itself and shape the outcome rather than determining whether it fitted a theory or hypothesis. To increase the validity of the analysis, three researchers separately reviewed the transcripts and coded the data descriptively. The researchers then met and discussed their individual findings, noting similarities, differences and patterns, then organised the data into tables which revealed significant patterns. The process allowed the capture of important information with identified categories as reliable discriminators. Examples of categories include: social; collegial; learning skills; study practices; enhanced commitment; imagined futures; scheduling; format; atmosphere; hospitality; physical space.

The categories were distilled through this iterative process of review, insightful invention, and induction (Van Manen, 2016) into three specific emergent themes. The first theme concerned the value of relationship development, which included peer to peer relationships as well as mentor to mentee. The second emergent theme was that of the development of academic skills and understandings. Finally, we noted the theme of supportive environmental factors for success, both of relationship development as well as skill development.

Follow Up Questions.

In addition, follow up emails were sent to the participants at the end of the following semester (~ 10 months after the end of the program) of the event to better understand the ongoing impact of the project. The students were asked to respond to three questions regarding their perception of their experience. We wanted to understand if the effects that arose from the data collected previously as to student perceptions of their experiences and skill development were sustained over time. The emails were collected by one researcher, with the responses organized by a second researcher to understand if and how the effects of the project were sustained over time.

Results

Across the multiple sources of data four themes arose. This section we present and describe these four themes. Specifically, the themes consist of: personal growth, skill development, connectedness and significant environmental factors.

Personal Growth

Data from all sources supported the participants' perception of personal growth, including confidence in themselves as students, writers and researchers. The journal entries documented this process through initial feelings of uncertainty for instance: "*I'm realising I'm not very good at research. . .*" (19), and another comment indicated an uncertainty about what to expect: "*The beginning of this journey has allayed my initial anxieties in regards to the context of work, the expectations of the researchers/lecturers* (15). As the days progressed, many comments evidenced a persistence to keep trying, even if the tasks were unfamiliar or difficult, such as: "*I found it difficult to review a study as I've never done it before, however, it was a good experience and I learned from it*" (19). As well as persistence, there was a sense that the hard work would pay off: "*I look forward to getting into the many different facets of research as we go along, and to improving my search methods and notation of findings*" (15). It is important to note that this persistence may have been supported by the multiple opportunities for peer modeling and mentoring. In the focus group discussions, several participants expressed their initial reservations about the prospect of developing a learning community in a group comprising undergraduates, postgraduates, and academic staff.   As one student commented, "*At first I wondered how PhD students and first year students were going to work on the same project because of the different levels of experience, but you don't feel it in this room, everyone works in a very mutual manner which is great*" (T1.7).

Towards the middle of the journals, there were quite a few comments that indicated an air of discouragement, such as: "*I'm quite disappointed in the work that I've done today*" (10). Another participant commented: "*I found that I was questioning whether I was contributing in a meaningful way*" (15). The participants were struggling with new and unfamiliar tasks, and this difficulty was evident: "*I tried to do something new today, but I realised I didn't actually know what I was doing*" (19). However, their persistence was rewarded through a growing sense of confidence and accomplishment, such as: "*I am confident I will produce some quality work*" (13). This increased confidence was fueled by their successful task accomplishments, for instance: "*Today has been a really productive day. While I am still slow, I didn't question my ability to tackle today's task*" (15). As their confidence in themselves as well as their abilities improved, the participants became more fully engaged in the tasks, for example: "*My research is becoming continuously interesting and is making a lot more sense*" (13).

The follow up data provided evidence that this increased level of confidence was sustained 10 months after the project ended. When responding how the experience had impacted their university experience, one of the participants noted: "*This year I have not felt so confronted by the work…*" Another student mentioned how she "*...* [I have] *felt far more comfortable and confident this year, and I put a lot of that down to being a part of the research project. With everything from research, to approaching lecturers and working with peers.*" A third student reported an easier transition into study at the beginning of the year and felt more confident to approach assessment tasks.

Skill Development

This growing sense of confidence in themselves and their skills reported by the participants across the journal entries was supported by the end focus group discussions. Even

more important was the ability of the participants to generalise their new found confidence and skills to carry through to academic tasks with multilevel improvement, ranging from basic writing and organizational skills to more advanced levels of conceptual understanding around academic concepts and research. Examples of basic skill development was evident in such comments as: "*How to read, skim read and look at an abstract and say is this what I need and if not, don't waste your time reading the article" (T1.4);* and, *"Putting key words into data bases"* (T1.39)*, as well as basic study strategies such as, "Loved learning how to summarise and take notes"* (J2.6). The development of improved organisational skills was seen in comments regarding planning, "*I learned how to make my life easier. I have a plan and a structure"* (J2.8); and overcoming procrastination, "*how to start the assignment so you don't just stare blankly"* (J2.9). Being shown how to approach research papers also dispelled some of the mystique around research: *"It definitely changed my ideas as I thought peer reviewed articles were so in-depth and then I started working on them and it made them real and more accessible"* (J3.26). The hands-on experience of the students allowed them to become more comfortable interacting with academic writing both as a writer and a reader.

Although skill development and confidence were identified as two separate and important concepts, they were also interrelated. The initial lack of confidence seemed to be fueled by the participants' fears around being unsure of what to expect from the sessions as well as feeling that their skills were inadequate for the tasks asked of them. However, as the participants became engaged in the work, it was clear that their increased confidence was related to feeling that the tasks asked of them were doable, not beyond their capabilities and that there was available support from the mentors. As one participant expressed: "… *allayed my initial anxieties in regards to the context of work, the expectations of the researchers/lecturers"* (15); and another stated: "*I started to feel more confident in myself about my planning and writing process"* (11).

Another interesting point in this is the seriousness with which participants considered their learning of new skills. Many of the journals included very carefully detailed, step-by-step notes on the tasks they were learning, including coding processes, data based search methods, and the rationales for particular searches and literature reviews. There was also evidence of the participants taking ownership of the processes, many of the entries referred to "*my research*", but also examples of problem solving and decision making by the participants regarding the tasks and processes, such as: "*This 'roadblock' led me to start thinking of ways to approach the task ahead. So far I have decided to broaden my search from Early Childhood to Primary Education. … I aim to identify and evaluate common ideas, which I will then use to apply at an EC level"* (13).

This evidence of taking ownership, or personal responsibility for learning, could be instrumental as to the participants' growing ability to identify as future professionals. For example: *"I feel more committed to my area of study … I can now take away what I have read and support what my practice is – especially mathematics which is play related … how important it is … there are so many articles that support this … I can … be confident to do play-based mathematics"* (T1.10). Further, the data would suggest that the possibilities of what their future could be was becoming broader through their exposure to their mentor role models and their participatory engagement, for instance: *"I didn't understand how important it was to have researchers … If we didn't have researchers we wouldn't know what we know"* (J2.22). A number of students didn't really understand before the experience how research was undertaken and were surprised at the collaborative nature of it*: "I [now] know research is more than reading*

and stuff, that research can be more like collaborating in teams and sharing" (T4.12)*; "My ideas changed significantly as I had no idea what researchers did. I assumed they sat in an office and read journals all day"* (J2.22)*.* Overall, the experience was a pivotal shift in thinking, because: *". . .* [this] *academically opened my eyes to different facets of research"* (2), and allow students to broaden their view of professional options available both in relation to post graduate study opportunities: *"The options are now various and I can see down the line I could do a research degree"* (T1.13); as well as how research is relevant to classroom teaching: *"Teachers in the schools are doing [action research] and it's quite doable"* (J2.28). This richer understanding of the profession may also provide for greater impetus and engagement with current studies as it helps the students to see their study within a broader, more future-orientated context.

Connectedness

Woven through all of the data was the underlying theme of being connected in multiple ways, including being connected with peers, the academic researchers who were mentoring them, as well as a connection to the projects, or a sense of being a part of something important. This was noted specifically by comments such as: "*I enjoyed working on a special project that I kind of liked. It made me feel supported and as though I belong in the* [university] *community"* (19). The participants placed great value on the interactions and conversations with others in the group. As noted previously, as the participants engaged in difficult and unfamiliar tasks, they began to feel discouraged, however, their conversations with the researchers as well as their peers helped them to persevere and develop more confidence in the end, such as: "*Have discussed this [feeling inadequate] today with both peers, and a mentor and am feeling more confident…"* (15).

Much of the data supported the notion that a strength of the project was the group aspect which allowed for rich interactions among participants in different roles supporting a strong sense of collegiality and respect across the research mentors, postgraduate students and undergraduate participants, such as: *"Sharing thoughts and interesting ideas with a partner was an effective method for me as I was able to consolidate my understandings and learn new interpretations"* (13). The goal was that everyone worked together on an equal footing and many comments were indicative of a general sense of collegiality: *"You never felt uncomfortable, even with the academics. There seemed to be equality in the room"* (T1.7)*; "You felt valued by all in here. People were very welcoming …We felt like we were all on the same [footing]"* (J3.14). This comment entered in a participant journal on the final day, sums it up quite well: *"... also [I am] personally feeling a part of an inclusive and supportive environment of people from various backgrounds and experience."* Overall, the data strongly support a dual benefit as the participants believed their contribution was valued, and they appreciated the opportunity to learn from others.

Significant Environmental Factors

Several of the observations highlighted the significance of environmental factors to support the development of relationships as well as skills. The comments indicated that the

designation of a space and attention to physical needs provided structure, a sense of a safe space, and made the students feel valued and appreciated. This structure was created not only through the physical space: *"… coming to a space… here it feels like…coming to your own little office."*(J3.10), but also through the personal connections: *"Being checked in on…people were sincere when they asked us."* (J3.15). The consistency created by having a designated room to come back to each session and having interested, involved colleagues, both students and staff who were consistently present was important to create this sense of belongingness, as one student expressed: *"I liked working with everyone…made me feel like I belonged and wasn't alone"* (J2.4).

The sense of value was also supported by the attention to hospitality: *"Something small, the food and drinks … made us feel we were appreciated."* (J3.13); and *"The coffee runs were great in the morning. It was a gesture of appreciation which was very thoughtful"* (T1.26). The second week a different room was used, and the students noticed the difference: "*The first room was great- the second room the tables were not good for collaboration at all and it was small…"* (T4.21). Comments of this type highlights the need to allocate appropriate resources which will support the processes of learning and relationship building, rather than detract from them.

Discussion

University study requires different skills than those needed for secondary education or even work environments (Morisano et al., 2010). Students who do not acquire appropriate study skills may be at risk of underperforming academically or even withdrawing from university. Besides needing appropriate study skills, Bowles and Brindle (2017) posit that it is also important for students to integrate into the university community and develop a sense of "belongingness." According to Gopee and Dean (2013), university students can improve their writing and study skills through informal instruction and peer support. This instrumental mentoring project provided an opportunity for undergraduate university students to engage in authentic writing and research tasks with their peers and academic researchers. The students received instruction, modeling, and peer support within a supportive, non-evaluative environment. Qualitative data were collected at three different points including across the project (daily journal entries), at the end of the project (focus groups), and after ten months had passed (follow up query). These three different, but related sources of data allowed us to better understand not only the participants' perception of the changes they experienced, but also the processes of that change.

Overall, the participants reported positive experiences through engagement in authentic research tasks such as searching for and synthesizing literature, assisting in data analysis and engaging in philosophical discussions. The opportunity to engage in these tasks with students at various undergraduate and post graduate levels as well as academic staff helped to develop confidence in their academic skills as well as a sense of connectedness to their peers and the academic researchers, aligning with work by Bandura (1977) and Ryan and Deci (2000). There is evidence from the follow-up data gathered that this sense of confidence and belongingness was sustained and carried over to promote positive engagement in the university experiences of the participants for the next 10 months or two academic semesters. It is interesting to note that the students felt that environmental details such room location and arrangement and elements of

hospitality such as lunches, coffee and tea were important. We would assert that far from being insignificant details, factors such as dedicated and stable locations, and care for physical details such as refreshments represent to the participants that their contributions to the project are valued and appreciated.

This project directly affected a small number of students (n=19). This small number is a strength of the project which contributed directly to the ability for students and researchers to engage on a meaningful level to support the development of rich relationships. Therefore, in considering future similar projects, we would advise maintaining a low staff to student ratio. These groups could be developed around specific discipline areas, research interests, or other specific variables to encourage interest and participation. Although scaling up a project is desirable to be able to affect larger numbers of students, it is still important to maintain an atmosphere of intimacy and community. Creating multiple small groups around individual interests would help to support this feeling of community.

The data collected in this project provided important insights as to the perceptions of the students who participated, however, it is important to recognize the subjective nature of this type of data. Possibilities for future studies which gather objective, quantitative sources of data such as academic grades collected pre and post intervention in addition to participant perceptions would be valuable to further understand the impact that participation in authentic learning experiences have upon academic achievement. Finally, the focus in this study was generally around student perceptions as to the effect of authentic learning experiences on perceptions of student confidence and engagement. An important extension of this research would be to learn more regarding possible mutual benefits to both students as well as researchers who engage in an instrumental mentoring project such as this.

Our universities today are as diverse as the societies in which they are located. Each student is likely to have different goals, skill levels, and come from vastly different backgrounds. This diversity can be a challenge to support each student to obtain a valid educational experience. However, providing opportunities such as this instrumental mentoring program may be one method to support students' transition from hesitant, unsure, beginning university students to confident, lifelong learners, who see learning as a way to enrich their lives. As one of our participants expressed: *"I found the more I read, the more [I could see] things in common and it makes me happy"* (T4.13). Although there are many valid, different reasons to engage in post-secondary education, being able to see our students develop a love of learning, is worthwhile indeed. Programs such as the instrumental mentoring program outlined in this paper have the capacity to support student engagement and potentially retention.

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