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Mentoring Early Career Researchers within a Cross-Disciplinary Community Research Project

ABSTRACT

This paper reports on the mentoring of early career researchers at a regional campus of a University in Queensland, Australia. The mentoring process involved mentees actively participating in a community research project. As the participants took on the roles of mentee or mentor dependent upon the research activity at the time, the mentoring process could be deemed as being a mentoring mosaic. Participants who identified themselves as being mentees were interviewed to identify their reasons for participating, the outcomes they experienced and what caused the outcomes to occur. They also completed self-assessment scales to identify changes in the levels of their research skills, confidence and attitude towards mentoring others. The results clearly showed that the mentees had very positive outcomes associated with their involvement in the project both in relation to research confidence and capability and also the development of positive working relationships. Mentees reported that the key drivers leading to the identified outcomes as being the structure of the research project, the diverse backgrounds and generosity of the participants as well as the inclusive practices employed.

The publication of the “Powering Ideas: An Innovation Agenda for the 21st Century” report by the Australian Government in 2009 focussed attention squarely upon the enhancement of the research skills and on increasing collaborative research (Department of Innovation Industry Science and Research, 2009). As a result Universities are under pressure to not only increase their research output but also to improve the quality of that research. At a small regional campus a cross-disciplinary, community based project was conducted with the goal of mentoring early career researchers. The mentoring process employed in the project has been classified as a *mentoring mosaic* whereby peers worked together on a common project, learning from each other, with the roles of mentor and mentee being dictated by the task and not by position within the organisation (Mullen, 2009).

This paper will outline the benefits or issues experienced by participants (self identified as mentees) in the cross-disciplinary community project. Data will be presented from a survey instrument which identifies changes in perspective of the participants in relation to their research skills. Interview data will also be provided which details the reasons why participants chose to engage with the project and their perspectives as to the reasons for the research outcomes they have experienced. This paper reports on the changes that have occurred in the first 6 months of the cross-disciplinary community project. The setting for this study is a University campus located within a regional centre of Queensland.

In 2010 an opportunity arose to apply for a \$30 000 Research Grant to fund a community based research project with the aim of forging closer links to the local community. A meeting of all interested staff (14 in total) was organised to discuss the possibilities associated with the project. During this meeting the issue of mentoring of Early Career Researchers (ECR) was raised and it was agreed that any project undertaken should have twin foci, those of community engagement and mentoring ECRs. All staff were given the opportunity to formulate brief research proposals that they deemed would meet the agreed goals, to be shared with the interested staff at a special meeting to choose the successful project. The Sunny and Healthy project was chosen as it was seen to be achievable, inclusive of the needs and interests of participants and supportive of research skill development. Participants then chose which activities and which roles they wished to fulfil. This paper focuses on the mentoring process employed in the cross-disciplinary research project (Sunny and Healthy) and identifies the reasons mentees joined the project, the outcomes these mentees have experience through their involvement and the factors identified by the mentees as being the reason for the outcomes.

Literature Review

Mentoring is a term used extensively in educational and business settings, but what is understood by this term varies considerably. Historically mentoring has been described as a learning relationship between an older, wiser, more experienced person and a younger, less experienced, less knowledgeable 'protégé' (Ehrich, Hansford, & Tennent, 2004; Haney, 1997; Jeruchim & Shapiro, 1992). This situation is not as likely to be the case in the 21st Century whereby age does not signify the mentor position and the focus upon one mentor-mentee relationship being the basis for the majority of learning is disputed.

The mentoring process can take a variety of forms. Formal mentoring is viewed as mentoring initiated by the employing organisation whereby a supervisor inducted a new member of staff to the culture of the setting and developed their skills in alignment with the needs of the organisation (Clarke, 2004). In contrast informal mentoring relationships develop "spontaneously ... through people getting to know each other in the work environment" (Clarke, 2005 p. 4). Although identified as different forms of mentoring, formal and informal mentoring have a common characteristic as the mentor-protégé relationship is dyadic in nature: it is the interplay between 2 people one being the mentor and one being the protégé.

In recent times a range of new mentoring processes have come to the fore including co-mentoring (Mullen, 2000), mentoring circles (Darwin & Palmer, 2009), mentoring mosaics (Mullen, 2009) and triad mentoring (Mullen & Hutinger, 2008). The major difference between these forms of mentoring and the previously described forms is the broadening of the relationship involved from being dyadic in nature to involving a group of people with multiple mentors and one or more protégés. Of special significance for this report is the notion of the mentoring mosaic where peers interact with the mentor and mentee roles alternating, "sponsoring the learning of all parties through a synergistic, flexible structure." (Mullen, 2009 p. 20)

Not only are there different forms of 'mentoring' but researchers in this field also identify different phases through which the mentoring relationships transition. Kram (1983) identified 4 phases these being where the participants identify the possible outcomes from working together (initiation) followed by the mentee developing a sense of competence (cultivation), the re-evaluation of the outcomes from the relationship (separation) and finally where the relationship becomes a friendship (redefinition) (p. 620). Kram (1983) also identified two forms of outcomes associated with mentoring in the workplace, these being career development and psychosocial development.

Specific outcomes from mentoring have been reported by Ehrich, Hansford & Tennent (2004) citing the most frequently identified outcomes for mentees being related to support, encouragement, skills development and sharing of ideas and advice. Authors such as Higgins and Kram (2001) have identified a range of factors which impact upon the outcomes from mentoring relationships. They state their belief that individuals that enter the relationships wanting career assistance as well as collegiality develop "strong-tie developmental relationships". The nature of the individuals involved is also identified as being critical with traits such as honesty, trustworthiness, empathy and generosity being highlighted.

Method

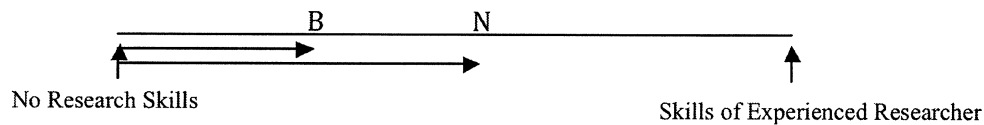
The design of the research is based on a mixed method approach (Brewer & Hunter, 1989; Cresswell, 1994; Johnson & Christensen, 2004; Tashakkori & Teddlie, 1998, 2003). Such an approach is defined as "a class of research that combines both quantitative and qualitative research techniques, methods, approaches, concepts or language into a single design" (Johnson & Onwuegbuzie, 2004 p. 17). The 14 members of the Research Team were approached to provide data for this paper. Only the responses of the 10 participants that identified as being mentees are reported here. Some key features of the group of mentees are detailed in Table 1. below:

Table 1. Demographics of Mentees

| Demographic | Results | | | | | | | | | | | | | |
|-----------------|-------------------|---|------------|---|------------|---|------------|-------------|-------------|---|-------|---|-------|---|
| Gender | Female | | | | | | | Male | | | | | | |
| | 7 | | | | | | | 3 | | | | | | |
| Role in Project | Mentor and Mentee | | | | | | | Mentee Only | | | | | | |
| | 7 | | | | | | | 3 | | | | | | |
| Years employed | 0-4 years | | | | 5-9 years | | | | 10-14 years | | | | 2 | |
| | 4 | | | | 4 | | | | 2 | | | | | |
| Job Description | Lecturer A | 1 | Lecturer B | 6 | Lecturer C | 1 | Lecturer D | 1 | Other | 1 | | | | |
| Age | 25-29 | 1 | 30-34 | 1 | 35-39 | 0 | 40-44 | 1 | 45-49 | 2 | 50-54 | 3 | 60-64 | 2 |

Quantitative data was collected through the use of a survey instrument to identify demographic background. To measure the change in participants' perceptions related to research capability and confidence in supporting other researchers, respondents were required to mark a letter 'B' on a 10 centimetre continuum to represent their perception of where they were *before* the commencement of the project and an 'N' for their perception *now* at the data collection phase of the project. This process was adapted from the Outcomes Rating Scales (ORS) developed by Miller and Duncan (2000). An example of the continua can be found below. The 4 scales used to measure the perceptions were continua from:

1. 'No Research Skills' to 'Skills of a very experienced researcher'
2. 'No confidence in ability to write publishable papers' to 'Very confident in ability to write publishable papers'
3. 'No willingness to take on a mentoring role' to 'Very willing to mentor other's research'
4. 'No confidence in ability to support others development as researchers' to 'Very confident in my ability to support others development as researchers'
5. Numerical scores associated with the 'B' and 'N' marks were calculated by measuring the distance from the left edge of the continuum to each mark.



Qualitative data was collected through the use of semi-structured interviews. The guiding questions being: (1) What were you hoping to get out of your involvement in the Project?, (2) What outcomes have there been for you as a result of your participation in the Project? and (3) What characteristics of the Project and the associated Research Team have contributed to these outcomes (or lack of outcomes)? The data collected through the interviews were transcribed and entered into the Qualitative Solutions and Research (QSR) NVivo 9.0 Nudist software program for analysis.

Results

The measures of the perceptions of the participants in relation to research capability and mentoring capability are recorded in Table 2 below. All 4 measures displayed increases from the commencement of the Project to the point in the project where data was being collected and initial analysis of pilot data had commenced. The largest change being associated with improved research skills. Although there were positive changes in all measures the individual scores still fell below what could be deemed a satisfactory score of 5 on a 10 point scale.

Table 2 Change in Participants' Perceptions

| | Low Score | High Score | Mean Score | % Change |
|----------------------------------------------------------|-----------|------------|------------|----------|
| Research Skills Before Commencement | 0.1 | 6.5 | 2.96 | +46% |
| Research Skills At Data Collection Stage | 1.0 | 7.8 | 4.31 | |
| Confidence Writing Papers Before Commencement | 0.8 | 6.6 | 3.41 | +30% |
| Confidence Writing Papers At Data Collection Stage | 1.2 | 6.6 | 4.44 | |
| Willingness to Mentor Others Before Commencement | 0.5 | 7.1 | 3.42 | +34% |
| Willingness to Mentor Others At Data Collection Stage | 1.2 | 9.3 | 4.58 | |
| Confidence in Ability to Mentor Before Commencement | 0.2 | 6.7 | 3.53 | +34% |
| Confidence in Ability to Mentor At Data Collection Stage | 1.1 | 7.7 | 4.73 | |

The data obtained during the semi-structured interviews, upon coding and classifying utilising the NVivo 9.0 software package, resulted in clear categories and subcategories. The categories and subcategories for each of the questions are detailed in Tables 3, 4 and 5 below.

Table 3 What were you hoping to get out of your involvement in the Sunny and Healthy Project?

| Category of response | Responses | Major Subcategories | Responses |
|---------------------------|-----------|-------------------------------------|-----------|
| Improving Research Skills | 8 | Learning specific research skills | 5 |
| | | Access to experienced researchers | 3 |
| | | Seeing how to conduct research | 3 |
| Developing relationships | 7 | Collegiality | 4 |
| | | Working with others outside Faculty | 2 |
| | | Learning how people work together | 2 |
| Name on a Publication | 4 | Publications | 4 |

In the responses to the first question, 'Improving research skills' and 'Developing relationships with other staff' were the most representative categories. When the Improving Research Skills category was further interrogated the wish to learn specific research skills such as data analysis featured prominently, whilst having contact with someone more experienced in research and observing their methods were also identified. Within the 'Developing Relationships with Others' category, the wish to work collegially was the most often identified response.

Table 4 What outcomes have there been for you (if any) as a result of your participation in the Sunny and healthy Project?

| Category of response | Responses | Major Subcategories | Responses |
|-----------------------------------|-----------|---------------------------------------------|-----------|
| Improving Research Skills | 9 | Learning the steps of research process | 7 |
| | | Learning SPSS | 5 |
| | | Understanding others researchers viewpoints | 4 |
| | | Confidence in ability to research | 3 |
| Improved relationships with staff | 8 | Collegiality | 6 |
| | | Confidence to have work critiqued | 2 |
| Thinking | 5 | Seeing how other faculties think | 3 |
| Improved mentoring skills | 4 | Confidence to mentor others | 3 |

When asked to identify the outcomes experienced by the respondents due to their involvement in the Project the resulting categories were very similar to those that emerged in the Question 1 responses. Once again the 'Improved Research Skills' and the 'Improved Relationships with Other Staff' were the most prominent categories. The most often reported outcomes were the development of an understanding of the research process as a whole and learning how to use the SPSS software package. Collegiality was

described as an outcome by 6 respondents. One key theme that emerged which was represented in all categories associated with Question 2 was that of ‘confidence’. Respondents identified outcomes associated with confidence in own ability to research, confidence to have work scrutinised by others and also confidence in mentoring others in relation to research.

Table 5 What characteristics of the Project and the associated Research Team have contributed to the outcomes (or lack of outcomes)?

| Category of response | Responses | Major Subcategories | Responses |
|-----------------------------|-----------|--------------------------------------------------|-----------|
| Participant characteristics | 9 | Supportive nature of participants and generosity | 6 |
| | | Existing good relationships | 4 |
| | | Different backgrounds | 3 |
| Project characteristics | 8 | Project chosen to suit participants | 8 |
| | | Participants chose to be involved | 4 |
| | | Topic of project | 3 |
| Campus characteristics | 2 | Small size of campus | 1 |
| | | Proximity of participants | 1 |

In the third guiding question respondents were asked to identify aspects of the Project that had led to the outcomes they had identified previously. The characteristic most frequently identified was that of choosing a topic that most suited the needs of the mentees and the skills of all participants. The nature of the people making up the research team was also frequently described as integral to the outcomes for the respondents. Respondents described the supportive nature of the research team members, their generosity as well as pre-existing positive relationships brought into the project as being highly influential on the outcomes experienced.

Discussion

Analysis of the data indicates that the mentoring relationships resulting from the Sunny and Healthy Project could be attributed to the psychosocial and career development identified by Kram (1983). The responses to the first two questions in the semi-structured interviews showed that not only were the participants looking for these outcomes but also that they have experienced these outcomes through their involvement in the Project.

In Kram’s research four stages of development of the mentee-mentor relationship were identified. The initial stage of ‘initiation’ where mentors and mentees realise the value in working together is clearly illustrated by comments such as:

“It is definitely the network ... if I didn’t build those relationships with all those people who are involved in that project, I wouldn’t be able to have those critical conversations with them to be able to pull that information back out and make it my own again”

The subsequent stage of ‘cultivation’ is also evident in that mentees perceived they were growing in confidence, reflected in comments such as:

“[the project] gave me a base to work from and gave me a comfort zone that I did not have before and gave me some confidence that I did not have before in knowing that I could properly put out a paper on my own”

Numerous researchers have identified the importance of developing strong personal connections for the development of effective and productive mentee-mentor relationships. Rymer (2002) states that “Successful mentorships represent strong ties, deep connections of high levels of trust and caring with mentors who are motivated to help their partners”(p. 344). It is apparent from the responses of the mentees that these connections have been forged. A majority of respondents identified the development of strong relationships as either an outcome of their involvement in the Sunny and Healthy Project or as a contributing factor that resulted in specific outcomes for them personally. When asked to elaborate on the

characteristics of the research team that had led to outcomes associated with the project, a response echoed by many respondents was:

“Probably trustworthy, professional but friendly and in it for the right reasons - in it for other people and not in it for themselves”

The respondent's satisfaction with the mentoring relationships developed through their involvement in the Sunny and Healthy Project can also be aligned with the quantitative data obtained from the survey instrument. Allen, Russell and Maetze (1997) found in their study that “protégés satisfaction with the current mentorship was positively related to [their] willingness to serve as mentors to others in the future” (p. 500). Participants in the project recorded a 34% improvement on average in relation to willingness to mentor others. This improvement can be seen as an indicator of a positive attitude change and thus reflects satisfaction with the mentoring respondents received as part of the Sunny and Healthy Project.

As the focus of the Sunny and Healthy Project was the mentoring of Early Career Researchers, changes specifically related to research are critically important. The data from the surveys and the semi-structured interviews both support each other in that the respondents perceived their confidence in relation to research had improved. The confidence related to not only the development of specific research skills such as analysing data using SPSS but also to mentee's ability to provide valuable input to the Community Project. The confidence that their contribution was valuable is reflected by the participants' openness to sharing ideas and work for critique by others and also improved confidence in their ability to mentor others. Thus the respondents have not only a belief they have the required skills (or can gain them) but also they have a support network to assist them to commence or continue their research. The development of a support network for Early Career Researchers is seen as vital. One respondent highlighted the importance of the development of a network saying:

“There have been lots of little conversations, corridor consultations that have occurred. My engagement with a colleague has allowed me to take bits and pieces away that have then contributed to my PhD work.”

The very nature of the ‘cross-disciplinary community research project’ underpins the outcomes described by the respondents. One critical element being that the project was chosen to meet the needs of the mentees as opposed to mentees choosing or being invited to join pre-existing projects. The focus from the outset being to be inclusive of not only the skills of the participants but also inclusive of the needs of the Early Career Researchers. This early negotiation was highlighted by one respondent who stated that.”

“The fact that the project emerged the way it did where people would put forward ideas themselves and then others looked at those ideas and had their say on whether that was a project that they wanted to take up, I think that was very well done.”

Another aspect of the Sunny and Healthy Project deemed vital was that of the interdisciplinary backgrounds of the participants and their varying research paradigms. This is clearly evident in the following response:

“You get fresh ideas from other faculties as I see it, different faculties have their own ‘X’ had the data analysis and maths, ‘Y’ had their scientific take of the stuff.”

The mix of participants was also viewed as an important factor leading to the outcomes experienced by the respondents. The majority of participants being Early Career Researchers was highlighted by one respondent who stated:

“If I was the only novice there I would feel really uncomfortable but I feel like there are few of us who don't know a lot, and a few of you who do a lot.”

Conclusion

Based upon the data collected there appears to have been a number of key characteristics of the cross-disciplinary research project which have led to significant outcomes for the mentees. Critical to the effectiveness of the project has been the concept of choice. Not only did the participants value the opportunity to choose whether they were involved in the project but they also valued the choice of level of involvement that suited their specific needs. The process used to choose the subject of the project was also viewed by mentees as important. The collaborative process utilised to identify the topic allowed the participants to 'size up' the other members of the research team and to evaluate whether their needs would be met by the project. This process is in stark contrast to formal mentoring processes whereby there is a well-defined hierarchy and clear delineation between mentor and mentee.

Another key aspect in relation to the setting up of the research project was that it involved all participants from day one. Mentees were able to experience and share in the full range of research project activities including the writing of the research proposal, initial literature review, ethics application and instrument construction.

The interdisciplinary nature of the research team was also highlighted as being an important aspect. The diversity of research paradigms, skills and experience allowed for a wide range of opportunities for the development of a better understanding with respect to research for the mentees. This diversity was also deemed to be very beneficial by those members of the research team that saw themselves as both mentees and mentors within the setting of the research project.

The responses elicited during the semi-structured interviews also highlight the need to focus upon the psychosocial aspects of mentoring. The supportive nature of the research team was identified by most respondents as being what they were looking for in choosing to be involved and also what they had benefitted from during this involvement. The need to focus upon including as many participants in as many different activities as possible and giving participants a voice in the decision making process was clearly evident in the data provided by the mentees.

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