Designing and validating a new research methodology: learning through practice.
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Abstract
This paper reports on my completed PhD research (Down, 2006) which investigated how educational practitioners were able to adapt and apply their knowledge and skills across different workplace contexts. One of the challenges in my research was to find a suitable methodology to use to validate an explanatory model which had been developed in the first stage of the research. Because the theoretical framework of the research was essentially based on the precepts of social learning theory, I needed to find a methodology which would enable my stage 2 participants to validate the model in a manner which was inclusive of contextual differences. This meant that the generalisations which they made in the validation process needed to be the result of the embedding of different contexts within one another, rather than the more prevalent type of generalisations which result from abstraction.

Predictably, I could not identify an existing methodology which would do what I required. Therefore, I designed a process and a questionnaire which would provide the type of embedded generalisations I was seeking. This paper reports on the resultant methodology; its effectiveness in the research process; and the evaluative comments of my participants on their experience of using participating in and evaluating the new methodology.

Introduction
This paper looks at the design of a methodology to suit my wider research project. It starts with an explanation of the wider research project and then specifically addresses the rationale for designing a specific research methodology which would provide a context-sensitive validation of the theoretical model which was established as a result of the Stage 1 methodology. This methodology is outlined briefly and relevant responses from the stage 2 participants of the research are discussed. The paper ends with a conclusion which looks at my appraisal of the research methods and their effectiveness in answering the key research question, that is, how these practitioners perceived the transfer of competence (that is, what people already know and can do) occurred, and on how they facilitate its development within their practice as teachers.

The research journey
My PhD research journey, on which this paper is based, has focused on learning and transfer, and how it is perceived by a group of educational practitioners. It has involved searching for, reading and thinking about relevant educational literature; listening to researchers present their findings at conferences; interacting with presenters and participants during research workshops; discussions with friends and reflecting on my ever evolving perceptions and understandings. Although I have forgotten, or deliberately rejected, much of the information I read or listened to, there has been no dross in this journey. It is through interactions with others - either directly or through some artefact- that we come to understand and be shaped by the social world. Such interactions offer us riches beyond measure.
The prime purpose of my research journey was to better understand how people “transfer” or adapt what they already know and can do when they move to a new work situation or when their work changes substantially. The objective of the research was to explore the perceptions of training practitioners, based on their own experience and on their expertise as facilitators of situated learning. It focused on how these practitioners perceived the transfer of competence occurred, and on how they facilitate its development within their practice as teachers. That is, the focus of the research was the capacity of training practitioners to transfer their own competence between different settings and, to a lesser degree, on the capacity of these practitioners to develop this capacity in their learners.

The participants in the research were vocational education and training practitioners who had experienced moving to a new job and/or substantially changing their work roles and functions; were involved in preparing and/or mentoring others to prepare for different work changes; and could reflect on their experiences of learning from and at work.

The purpose of the research was to provide an experienced practitioner voice in the current debates on the transfer of learning across different workplaces and work roles. In current Australian vocational education and training (VET) rhetoric, learning transfer is assumed to happen and is the basis of much of the new policy which has been introduced over the last decade or more (Smith & Keating, 2003, pp., p. 219). The development of competency-based training, and Training Packages in particular, has been premised on the belief that if these competencies are developed then people will be able to transfer them to different contexts. Such an assumption is a contested one from two points of view. First, it assumes that transfer occurs spontaneously, a concept which is not supported by current research (e.g. Billett, 1994, 1996, 1998; Mulcahy & James, 1998; Taylor, 1997). Secondly, it ignores the contextual nature of learning and the need to adapt existing learning when the context of the learning is altered.

**Stage 1 research methodology**

The first stage of the research involved an opportunistic sample of twelve practitioners, all of whom were known to me, and most had worked closely with me during the 1990s. Half of these were industry teachers/trainers and the remainder were from Registered Training Organisations. All twelve came from either NSW or Victoria with 5 males and 7 females comprising the sample.

Unstructured (or minimally structured) interviews were used to collect the stage 1 data. My choice of this data collection tool came from my perception that, if I wanted the respondents to think deeply about how they believed the transfer of competence across different work contexts occurs, then the interview needed to happen over time and in a format that allowed the respondents to explore for themselves their experience and perceptions of the phenomenon.

Fontana and Frey (2003, pp. 74-85) recognised a genre of data collection known as polyphonic interviewing (p. 81) and this was the tool I chose to use. It involves recording the voices of the subjects with minimal influence from the interviewer and then letting each data set stand on its own, without collapsing the collected data.
together. Instead ‘the multiple perspectives of the various subjects are reported, and differences and problems encountered are discussed, rather than glossed over’ (Fontana & Frey, 2003, p. 81). It is also an approach that sits comfortably within an activity theory approach.

The analysis of the data collected from this polyphonic interviewing technique was done using Yrjö Engeström’s framework for analysing a process of change/learning under four key questions. This is a matrix which maps the answers to the questions: who are changing/learning?; why do they change/learn?; what do they change/learn?; and how do they change/learn? against the five principles of activity theory. These are: that a ‘collective, artefact-mediated and object-oriented activity system … is … the prime unit of analysis’ (Engeström, 1999, p. 4); the multi-voicedness of activity systems; the historicity of the community; the central role of contradictions as sources of change and development; and the possibility of expansive transformations in activity systems.

The result of this analysis was a four stage model (that is, exploration, enactment, engagement and enhancement) of how the learning changed over time as the contextual boundary crosser moved into a new work context. I presented this model at a number of research conferences and the feedback, and discussion it evoked, convinced me that a process of validation was needed to determine the accuracy and usefulness of the model. However, I could not find an existing, recognised methodological lens through which to do this and so a new approach needed to be designed and implemented.

**Stage 2 objectives and parameters**
The key objective of this stage of the research was to validate the models and schemas developed in the first stage of the research and, also, to provide feedback on the acceptability of these research outcomes. Thus the questions which needed to be answered were: how applicable are the models and ideas developed in Stage 1 to a wider group of participants?; what basic learning principles and approaches underpin the transfer/adaptation of competence across workplace contexts?; What skills, knowledge, attributes, etc. do people need to manage the transfer/adaptation across workplace contexts?; and how should this be supported and/or reflected in formal educational contexts?

These sets of questions guided the research design, process and findings. However, as in all social processes, it is the unintended and unexpected outcomes that often have the potential to convey important meanings, provided that we are heedful of them. Therefore, the objectives of the research had a guiding role rather than a controlling one and acted to direct the research rather than constrain it.

The design of Stage 2 proved difficult. Although I conducted a number of literature reviews, I could not find a suitable process for the testing/validation of an educational model. It seemed to me that I needed to find a process which enabled the respondents to have the model explained to them, have the opportunity to ask questions about it and then to be able to consider their own responses. A series of focus groups seemed suitable, but this would have been both time-consuming and expensive, unless all the participants were nearby. For these reasons, my stage 1 research had been necessarily
restrict to people who I either knew well or who were in close geographic proximity. Thus, focus groups were ruled out.

Also, a web-based process was ruled out as, despite the technological advances of the past ten to fifteen years, I knew from work projects, that there are many excellent VET practitioners and enterprise trainers without reliable computer and/or e-mail access. So I decided to use a questionnaire supported by reading matter, a video and phone support.

That way, I expected that respondents would examine the model either by sight and sound (via the video) or through the perusal of a written paper depending on what their learning preferences were. They could contact me by phone if they had any queries or they could complete the questionnaire electronically or in hard copy and could return it via e-mail or the postal service. This would enable me to include respondents from all parts of Australia as well as a small group from other countries.

Stage 2 research methodology
Self-administered questionnaires are a form of structured or semi-structured interview (Fontana & Frey, 2003, pp., p. 62). The choice of a questionnaire as the data collection instrument in Stage 2 of the research was in response, firstly, to the relatively large number and geographical dispersal of the expected participants in this stage; and, secondly, to the purpose of this stage as a mechanism for seeking validation and feedback on the Stage 1 findings.

However, it was also necessary to ‘ground’ the questionnaire, so that participants responded to each question on the basis of their experience and not just on what their theoretical frameworks and/or working theories told them should happen. This was done by asking the respondents to first identify three stories about situations of the transfer of competence across different workplace contexts. One of these was an account in which the respondent was the main actor, one where another person was the main actor but the respondent was concerned in some way and the third “story” was a future scenario about which the respondent had been thinking. This process was designed so that the respondent would reflect on his or her experience, the experience of others (given the usual limitation that we cannot know exactly what others are thinking) and then to test out their working theories with a projection of experience.

Bradburn (1983) notes that most structured interviews leave little room for the interviewer to improvise or exercise independent judgement. However, a self-administered questionnaire is administered in a social interactional context and is influenced by that context. Thus, the respondents to my questionnaire wrote their answers as if conversing with me, changed the wording of questions to better suit their purposes, showed evidence of wanting to please, or otherwise, and felt quite at liberty to ignore those questions they did not want to answer, and did not fully complete the questionnaire in those cases where the time they had to spend was limited.

Descriptive statistics are often used in postpositivistic qualitative research. Denzin and Lincoln note that:

Although many qualitative researchers in the postpositivist tradition will use statistical measures, methods and documents as a way of locating groups of subjects within larger populations, they will seldom report their findings in terms of the
kinds of complex statistical measures or methods to which quantitative researchers are drawn (i.e., path, regression, or log-linear analyses).

(2003a, pp., p. 15)

Because of the relatively large number of expected responses (90), I decided that five-point Likert-scale items would be needed within the Stage 2 questionnaire in order to test the support for or importance of particular concepts. These were analysed (using SPSS computer software) as to frequency, weighted means, and simple measures of comparison. These Likert-scale items were accompanied by the provision of space for comments after every group of Likert-scale items and respondents were encouraged to explain or expand on their choices or to give any other feedback they considered important. In addition a number of open-ended questions were also asked on relevant issues.

Importantly, the questionnaire was designed as a learning experience in order to enable participants to think through the various aspects of the stage 1 model, and to bring to the surface many of the tacit understandings which underpin their everyday practice. The “stories” which participants were asked to choose and record, provided a learning device to ensure that their responses were based on a consideration of practice, rather than theory or rhetoric.

Many of the respondents recognised this and expressed their concern that they may have chosen the wrong stories; thus assuming that there were “right” answers. There were not. What the internal variation (that is, the same item having two or three different responses from the same respondent) did show was that the experience represented by the stories was contextually based, and thus there are no “right” answers.

The items within the questionnaire were either statements of, or questions which were designed to probe, educational beliefs. Multiple responses for the same item given by the same respondent provided support for the belief that learning is situated and is shaped by the multiple contexts and contextual factors which impinge on the learner and his/her learning.

As a learning “device” or tool, the questionnaire was designed to draw people into Vygotsky’s (1978) zone of proximal development. That is, a cognitive zone, in which the difference between what the learner knows and what the learner has the potential to know, is highlighted. It is, therefore, a state of mind where certainties become less so and contradictions and paradoxes loom large and need to be resolved. As Illeris (2002, p. 118) argues, it is this tension which provides both the need and the motivation for learning.

**Stage 2 data collection and analysis**

Most of the 90 participants in the Stage 2 research all received a mailed copy of a questionnaire kit. This consisted of a CD-ROM and a page of instructions on how to use the material on the compact disk. The material on the CD consisted of a video clip of a presentation of the model followed by a question and answer session; copies of the paper in both Word 2002 and Word95 formats; a set of diagrams in pdf format; a link to the internet to download the QuickTime software necessary to play the video
clip; and a link to the internet to download Adobe Acrobat in order to read the diagrams.

Participants who had reported that they did not have an e-mail address or a computer with a CD-drive were sent an equivalent package in the mail, consisting of: a video clip of my explanation and the question and answer session; the paper explaining the model; hardcopy versions of the diagrams (in colour) and a letter of explanation. Eight participants fell into this category.

**Questionnaire and research design**

The research design of this part of the investigation is not standard. It combines a number of methodologies and uses a mixture of methods to seek the answers to the key research question. It was specifically designed to answer this research question rather than to validate a standard methodology or approach. It also contains a research methodology inside of a research methodology – the research equivalent of double loop learning ((Argyris, 2000; Down & Hager, 1999).)

One of the intentions about the design of the questionnaire was that its completion should be a thought-provoking and worthwhile experience. It also was important that it reflected the characteristics of learning which the research was exploring. It, therefore, seemed important to ask the participants how they had felt both about the design of the research (which had been explained to them in the materials they received when they volunteered, or agreed to, participate in the research), and about the design of the questionnaire which they had completed.

This was an appropriate course of action given that seventy of the participants (78%) had undertaken post-graduate courses and could, therefore, be assumed to know something about research and questionnaire design. It is, therefore, interesting that nearly all those who did not answer this section came from the higher education sector.

Of the seventy participants who responded to this section, 80% either “definitely agreed” or “agreed” that the design was appropriate given the research question being investigated. Forty-seven people provided additional comments, all except two supporting the research design. For example, one participant asked some key design questions when she wrote:

> I do think it is appropriate and valuable to gain the insight of a group of people on these issues. We have all experienced a variety of learning experiences, at least through primary and secondary school and, I suspect, for most of your sample through tertiary qualifications as well. To answer the questionnaire you must have experienced transfer of learning in work contexts too. So this is most likely a well-informed, articulate, appropriate group of people to ask to reflect on their experiences.

(s2p031)

A second participant commented that the decision to ground the research in stories of personal experience was an appropriate way to elicit the data. He wrote:

> Basically, I thought the design was good. I endorse the approach of asking participants to identify specific stories to critically analyse in order to respond to the questions. This enables you to capture more specific, authentic and objective performance characteristics based on actual events rather than just general opinions.
In the absence of such specific stories responses would become much more generalised and subjective.

We use this strategy for self assessment of student Key Competencies by requiring students to reflect upon ‘real’ performances rather than a student’s general perceptions. Also, basing the analysis on ‘stories’ provides a ‘context rich’ platform for critical reflection – obviously important for this research.

(s2p003)

Overall, the positive reactions could be summarised by the following comment:

I was very impressed with full research design model and the researcher’s admission that the process of transferring competence is not always linear. I found the questions very pertinent to the topic of the perceptions of practitioners about the transfer of competence across workplace contexts.

(s2p078)

The respondents perceived the advantages to taking such an approach as providing a wealth of data; combining qualitative and quantitative research; its effectiveness; its grounded nature; its personalised nature; its reflectivity and its benefit to the participant (a very common response). On the question of risks and disadvantages, these could be categorised under seven headings, that is: the roles and functions of the stories: the lengthy, time-consuming nature of the data collection; the choice of participants; the failure of many intended participants to respond (as over 200 participants originally agreed to participate in the research); the innovative design; the validity of the data and analysis and the complexity of the process. For the majority of the participants, their responses indicated that the advantages outweighed the risks.

The question “What did you find useful and/or enjoyable about the questionnaire” elicited responses on learning; structure, the questionnaire kit; reflection on experience; thinking about learning and challenging. This is typified in the following two responses:

it presented the researcher to the audience – itself a form of learning. It provided visual cues and clues by way of professional diagrams which … lent further elaboration and modification.

the opportunity to reflect, analyse, evaluate and learn. To, in fact, fully understand your project and acknowledge the value of the [stage 1] respondents’ input.

(s2p034)

(s2p050)

Sixty-six of the participants (73%) responded to the question “What did you find annoying about this questionnaire?”. Of these, ten responded that they had found nothing annoying in the questionnaire. The remaining responses concerned issues of time and length; language; difficulties accessing the technologies used; questionnaire items; impact of the questionnaire kit; use of “stories”; information given to participants; and the need for discussion.

The following response from a participant probably accurately sums up those things which participants found annoying and also the wonderful attitude shown by the participants. She wrote:

I actually found it very time consuming, which, given my current workload, was quite annoying. I had to keep stopping and putting it aside, and then coming back to
it later, just to make sure that my responses were meaningful and to stop myself lapsing into ‘who cares, just say anything’ mode.

I respect the effort that went into developing the model, the paper, the videos, and this questionnaire. I also respect the importance of meaningful answers for the researcher. So despite my mounting work pressures and my frustration with the process I did make an effort to give meaningful responses.

(s2p052)

Reflections on the research process

The inclusion of the questions on the research and questionnaire design served a number of functions within the research process. Because this is research about the perceptions of the participants, the thesis tries to capture the voices of 109 people, that is, eighteen stage 1 participants, ninety stage 2 participants and the researcher. By their participation in the research, the stage 1 and 2 participants are collaborators in the research. Therefore, it was considered appropriate that they had a chance to reflect and comment on the data gathering and analysis processes as far as possible.

Another consideration is that whilst the participants are not strictly subjects of the research insofar they are not being subjected to some “treatment” or intervention, their taped explanations or questionnaire responses are analysed, described and used as the base material for the identification of general trends or commonalities. As such, they needed to be given the opportunity to comment upon the research and questionnaire process.

In general, participants were quite satisfied with the process and those who had concerns were able to express these and they have been noted above. The comments they made provided valuable information, not only about the research process but also about their perceptions about research participation.

For instance, throughout the responses there were clear indications as to their collective wish to please. Whilst this was inferred rather than explicit for most participants, it was more marked for others. “is this what you want?”, “I’m not sure if I chose the right stories” or ”my answers seem to be the same for all my stories” were typical of comments indicating a wish to please. For others, this attitude was more muted. They indicated that other participants might not give me the answers I wanted or I might find the divergent responses hard to collate and to make meaningful.

An extension of this was the wish that there had been some mechanism for discussion or interactive dialogue. This is not surprising given the passion, energy and enthusiasm which came through the responses to the questionnaire. It also underlines the need for interaction which is at the heart of learning and human endeavour.

Many of the participants recognised that the questionnaire had been designed as a learning process. That is, it was designed to engage them in reflection about the transfer of competence across work contexts in particular and about learning in general. It was designed to result in expansive learning rather than to lead them to an already known position about learning and its transfer across different contexts. There were no right answers any more than there were any wrong answers.
The design of the questionnaire was predicated upon the need to ground the responses and to ensure that they were based on experience and practice rather than on learnt theory. I was looking for the participants’ perceptions which had grown out of their own practice. Whilst it was obvious that, given the educational background of the participants, these perceptions would inevitably be influenced by educational theory, I wanted to ensure that it was theory verified and refined by practice. I saw the “stories” as providing a means of doing this.

This strategy seems to have been successful. Not only did the responses to the stories provide statistical evidence of internal variation giving support to the context-sensitivity of learning, but they also provided rich qualitative data about difference in experience and situations.

The design of the questionnaire was also predicated on the need to gain responses from a widely geographically-separated group of participants. As has been already stated, as a validation instrument, it was necessary to ensure that the participants were introduced to the model and the thinking behind it. Hence, a video was provided for those participants with a preference for aural learning as well as a more traditional paper to read. The questionnaire needed to be electronic given that the majority of participants were used to working with personal computers and providing information in this form. However, the range of participants meant that it also needed to be compatible with the inevitable different software and computers to which the participants had access and hardcopies were also needed for those without easy computer access.

These are the lessons learned from my research experience. Anything using information and communication technologies will be prone to breakdown and incompatibility issues. In addition, it will also be sensitive to the effectiveness of the human-machine interface (Suchman, 2000). That is, the gaps between what our computers can do; what we know our computers can do; and what we can easily make our computers do.

Interestingly, those who opted for hardcopy versions of the paper and diagrams and a video tape made no complaint about the questionnaire kit and its usefulness. Also, the return rate for those receiving the non-electronic package was 100%.

**Conclusion**

The methodology used in the second stage of my PhD and discussed above proved to be very effective in promoting the double loop learning which I wanted to achieve; both for myself as researcher and for the participants as active collaborators in the research. It also proved concomitant with the boundary crossing which is the context of the research.

The following three comments which came from the analysis of the data on the research and questionnaire design provide excellent comment on what was being attempted and what was achieved. The first comes from the participant who wrote ‘these questions about the questionnaire are fabulous’ (s2p087).

The second is from a participant who commented that the benefit of the questionnaire, for her, had been that ‘it made me think about what I care passionately about, reflect
on my own communities of practice and to interrogate existing theoretical positions’ (s2p087).

The third comment was concerned with the personal benefit this particular participant had gained from the research process. She wrote:

It made me think carefully about my own transference of competence across a number of roles and about how we support and also don’t support new staff in our organisation as well as those that undertake different roles which require additional skills. It also made me think about the extent to which competent people with high employability skills tend to transfer competence even when they have not been supported by a network or mentors.

It also gave me the opportunity to forgive myself for appearing to take so long to develop competence in my new position although it would seem that I am probably now moving toward the validation and integration stage. (Whew, I’m pleased I’m almost there!)

In conclusion, the methodology I devised for the second stage of the research project proved effective in enabling the participants to respond in depth to the questions, grounding their perceptions in “stories” of their experiences. In particular, it demonstrated their ability to generalise by embedding different contexts within each other and thus avoiding generalisation by abstraction. This, then, provided empirical examples of the application of the theories of Beach (1999) and Van Oers (1998).

References


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