

PUTTING LEARNING TO WORK: THE DISTANCE LEARNER AND TRANSFER OF LEARNING

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Transfer of learning is a fundamental assumption of educators. We trust that whatever is learned will be retained or remembered over some interval of time and used in appropriate situations (Ripple & Drinkwater, 1982, p. 1947).

Introduction

This paper provides an overview of research carried out for a doctoral thesis “Learning to transfer: The distance learner and transfer of learning” (Doyle, 2002). The thesis explored the question of transfer of learning from the perspective of distance students enrolled in a business degree.

Transfer of learning occurs when a learner uses what has been learned in one setting in a new and different setting. The aim of all education and training is that learning will transfer, and yet there is a wealth of research evidence which suggests that transfer of learning is difficult to achieve. It is crucial to develop an understanding of what helps and what hinders the transfer of learning. The evidence from the study was supportive of the likelihood of general and specific transfer occurring for strongly motivated learners within a vocationally oriented distance education programme.

The problem in context

Governments, industry, and individuals invest in education and training, and expect that educational and training programmes will develop the capacity of individuals to transfer learning to new and different contexts. Yet, concerns have been expressed at the apparent lack of transfer from education to everyday work situations, or from one learning setting to another.

The problematic issue in terms of transfer of learning is whether general transfer occurs. There is a growing acceptance among researchers and practitioners that specific skills and knowledge do transfer to similar contexts. Many would agree that learners can achieve specific transfer, e.g. students learn Microsoft Outlook in class, and they then use it at home or at work. The problem lies with transfer of generic skills to new contexts, and with generalising knowledge from one setting to a new and different context. For instance, the transfer of critical thinking skills developed on a course to a workplace context, or even the transfer of domain knowledge and understanding from a course to a significantly different context; for example, the application of knowledge gained on a statistical analysis course to a business environment.

Thorndike’s Theory of Identical Elements was the dominant influence on the study and theorisation of transfer for most of the twentieth century. Thorndike successfully challenged the earlier doctrine of Formal Discipline which held that learning subjects such as Latin, Greek, and Calculus exercised the brain which was like a muscle and led to superior academic performance in other subjects (Thorndike, 1913/1963; 1924). His analysis of examination results for their chosen subjects for thousands of students disproved that theory. He also conducted experiments using simple tasks and testing for transfer. His theory was that transfer of learning was dependent on the learning task and the transfer task being identical.

Detterman (1993, p. 5) distinguished between specific and non-specific or general transfer. He saw the latter as the transfer of concepts, principles, and strategies. Detterman dismissed non-specific transfer and argued that it rarely occurred and that the focus should be on teaching the specific skills and knowledge that would be used, not teaching skills that learners would then have to work out how to utilise.

The world that today’s students are being prepared for has a growing need for people who are both deeply knowledgeable about their “domain”, and who have well-developed “generic skills”. These

generic skills include the ability to be flexible, adaptable, creative, think critically, problem-solve and have the skills required for learning, and to transfer learning to new and different contexts.

The context of distance education

The study placed emphasis on the perspective of the learner, which has rarely been studied in terms of transfer. The context was that of a distance learning programme: The Open Polytechnic of New Zealand's Bachelor of Business (TOPNZ's B.Bus). Distance education, with its potential to cater for high numbers of students, is one of the options policymakers and education providers consider when addressing the resource implications of the "massification" of higher education and of catering for lifelong learning. Given that transfer of learning provides the best measure of the effectiveness of any programme of learning, it is surprising that there have been few attempts to study it in a distance education context.

Aims of the research

The aims of the research were to develop an understanding of:

1. the nature of transfer;
2. transfer of learning within the context of a distance education programme;
3. transfer of learning from the perspective of the students;
4. factors which facilitated transfer of learning from the B.Bus to workplace settings;
5. barriers to transfer of learning from the B.Bus to workplace settings; and
6. implications for designing and delivering distance education courses that nurture transfer of learning.

Methodology

The study used quantitative and qualitative approaches. These included a postal survey of students from five courses in the B.Bus, interviews with staff involved in course development, and interviews with 30 students from the five courses.

The survey was designed to protect anonymity and was sent to 245 students who had completed all course requirements for the courses selected. There was a response rate of 37.55 percent. Seventy-seven percent of the respondents were employed full-time, and 10.2 percent were employed part-time while enrolled. The survey consisted of a questionnaire with mainly quantitative questions with Likert-type responses, and included some open-ended questions. Data from the survey was analysed using SPSS10.

The survey consisted of four sections and was structured as follows:

1. Before the course: motivations, expectations, and reasons.
2. During the course: the learning experience: the effectiveness of course materials, learning, and assessment activities.
3. After the course (what learning was transferred: aids and barriers to transfer).
4. Background details.

Interviews were held with 30 learners who volunteered at the time they completed the survey and with 10 staff members (course developers and teachers) from the five selected courses. The interviews followed semi-structured interview schedules, and were audio-taped and transcribed.

Findings from the research

The study found that the learners had a complex mixture of motivations for studying. All wanted the degree qualification and/or to meet requirements for registration as an accountant. They shared a strong expectation that what they learned through their degree studies would transfer to current and future work situations. Most wanted intellectual stimulation. Some wanted to increase their self-esteem. The interviews helped illuminate the complex mixture of motivations, reasons, and interests the participants held in relation to their studies.

P3: *Yes, because I wanted it to be beneficial for work. It was something I'd looked forward to. I'd looked forward to doing that course, I'd read all the course information and it seemed like a project, and I love that sort of thing. So it was really important. It costs a lot of money to study, and I wanted it to be beneficial. And my boss really supports me and I want to be able to contribute, and it's an opportunity to earn more respect. And so I did. I just thought I don't want to go to strangers as such, I want to do something that's real in my work.*

The interviews highlighted the diversity of experiences and expectations learners bring to a single course, and the diversity of the contexts in which they are working and applying their learning.

The survey and interviews revealed that the students did not see their interactions with fellow students as being useful to learning for transfer. This was a surprising finding, and at odds with the literature on learning which has tended to stress the importance of interactions with fellow learners for learning, and for learning for transfer. However, in terms of contributing to learning and transfer these distance learners valued interactions with others, but not those with their fellow students. These learners integrated their learning with their everyday worlds, and not unsurprisingly they found interactions with friends, colleagues, managers, and clients enhanced the likelihood of transfer of learning.

The learners thought that in order to improve learning and transfer the courses needed to be more closely aligned to workplaces. There were calls for greater use of practical examples and opportunities to use one's own work for assignments. Other suggestions made by the learners were for: more local content; small business examples; service sector and public sector examples; and keeping the course content up to date.

The findings of the study provide grounds for greater optimism about transfer than the literature would suggest. The study provided support for the broad outcomes claimed by higher education in general and TOPNZ for its B.Bus degree. The learners in the study reported that they had gained specific and general skills, knowledge, and dispositions from their studies which transferred to their everyday lives. All could provide multiple and detailed examples of transfer of learning. Their degree studies made a significant difference to the learners' knowledge, skills, and dispositions. The learners reported that as a result of their studies they were more self-confident and open-minded, and held broader views of the world. In addition, they had learned to think more critically. The evidence was that those interviewed had grown in their skills as learners, and in awareness of how to be effective learners.

What was surprising in the light of the literature was the range and depth of examples of transfer provided. The examples provided highlighted the value of linking learning to real workplace problems and situations. When participants applied what they were learning to real problems and situations they appeared to engage in deep learning rather than surface learning. As a result, they grew in confidence and clarity about what they were learning, and what the future applications of that learning might be. The evidence suggested that their formal learning assisted participants in recognising the learning that lay hidden in earlier workplace experiences. This could be categorised as the "Aha!" factor: "Aha! That's why that happened." It appeared as if not only was current learning organised and stored for future retrieval, but also that inert knowledge was re-organised and re-stored and thus made accessible for future learning. The evidence suggested that the opportunities to reflect on and apply learning at work may have nurtured dispositions and habits which were conducive to transfer.

This suggests that the instructional approaches were supportive of transfer. But, it should be noted that few examples were provided of complex transfer. Instructional approaches were discussed with the staff who had been involved in course development and with teaching on the courses. Once specific and general learning outcomes were identified for a course the focus of the instructional design and teaching team members appeared to be on how to cover the curriculum and how to best prepare students for assessments and examination(s). Scant attention was paid by staff to future applications of the learning. This could be partially attributed to satisfaction with

established approaches, and partially to the Bo Peep “leave them alone, and they’ll come home” theory of transfer (Perkins and Salomon, 1990). There was no evidence of research or feedback from learners as to their experiences with application after completing the course, therefore it is likely that design and teaching team members relied on their own experiences and anecdotal information from students.

The only feedback referred to by staff was the end-of-course student evaluations, and the formal course evaluations. Almost no reference was made to transfer in these evaluations, or in the staff members’ comments on the evaluations. Course development team members who were not on the teaching staff claimed that they did not ever see evaluations for the courses they had been involved in.

The nature of transfer

The first objective of this research was to develop an understanding of the nature of transfer. The conceptualisation and theorisation of transfer of learning is a crucial but neglected area for educators (Ford & Weissbein, 1997; Schoenfeld, 1999). In the study reported here, transfer of learning was conceptualised within a constructivist view of learning anchored in cognitive psychology (Bransford & Schwartz, 1999; Gagne, Yekovich & Yekovich, 1993; Singley & Anderson, 1989). A cognitive constructivist approach is one in which learning is an individual process. Transfer of learning is an iterative process. All learning requires some degree of transfer.

1. Each learner brings to the learning situation their pre-existing knowledge schemas, orientations, or motivations to learning, and their preconceptions as to the future transfer of that learning.
2. In order for new learning to occur the learner needs to process the new “data” through their pre-existing knowledge schemas and in so doing both the new and the existing knowledge are transformed.

There is an emerging consensus among transfer of learning theorists as to the pivotal role which encoding and organisation of knowledge plays in the accessibility and retrieval of knowledge in new and different situations. If knowledge is encoded and stored for the end-of-course examination questions, or to address an essay topic, then they are the future uses knowledge will be available for. Importantly, if knowledge is encoded for future use in addressing workplace problems which are typically ill-structured and multidimensional, then that is how the knowledge will be encoded and organised, and the type of situations that it will be accessible for. In essence, this is a cognitive explanation of meaningful learning enabling generalisation to unpredictable future situations.

This conceptualisation of transfer places considerable emphasis on the prior learning and motivations that learners bring to the learning experience, and the way these contribute to the construction of learning. To paraphrase Salomon and Perkins (1989), such learning is in part “backward reaching”; it is also “forward reaching” in relation to the transfer situation – reaching forward to the future.

The study identified few examples of more complex transfer. Complex transfer requires what Perkins and colleagues refer to as far-reaching high road transfer, which relies heavily on metacognitive skills and requires creative, adaptive, and innovative thought from the learner. Larkin (1989) referred to transfer as requiring “new learning”. Bransford and Schwartz (1999) reconceptualised transfer as “preparation for future learning” (PFL). Detterman (1993) and many others deny the probability of general transfer; and yet, it is the form of transfer increasingly being sought from tertiary education providers.

PFL challenged prevailing approaches to transfer which had denied the possibility of general and complex transfer. Prevailing models examined transfer as direct application (DA), and assessed whether or not transfer of learning had taken place within sequestered problem-solving situations (SPS). There is a growing convergence among constructivist and cognitively oriented researchers of the need to reconceptualise transfer, and to stop measuring transfer as direct application but

move to measure it in terms of preparation for future learning (PFL). Bransford and Schwartz drew on the work of Broudy who distinguished between knowing that, and knowing how (replicative and applicative knowledge) and “knowing with”. The findings in the current study broadly support a PFL approach to transfer.

From a PFL perspective, these types of interactions are to be encouraged. An important component in preparing for future learning is knowing how to set up the “transfer” situation for learning. This entails identifying resources, setting up networks, and being able to ask effective questions of others in order to access support and thus facilitate new learning. Activities which make the value of such actions explicit and provide opportunities for learners to set up situations which support their learning need to be incorporated into the instructional design.

Discussion on overall findings and implications for course design and delivery

There is a growing literature providing sound guidelines concerning the factors which enhance the teaching and learning for transfer (Bransford & Schwartz, 1999; Ford & Weissbein, 1997; Haskell, 2001; Misko, 1995; Perkins, 1988; Singley & Anderson, 1989). The insights gleaned from the current study on factors facilitating transfer of learning were consistent with the literature.

If the potential of learning to transfer is to be realised, then transfer needs to be specifically attended to. This is not a novel view but one which has a history within the study of transfer including Ellis’s (1965) suggestions for teaching for transfer; Fogarty and colleagues’ (1992) call for a “shepherding of transfer”; Sternberg and Frensch’s (1993) suggestions for teaching for transfer; and Haskell’s (2001) eleven principles for transfer. In addition to attending to transfer within the design of courses, there is a need for learners to have specific instruction on effective strategies for learning and transfer (Fogarty et al, 1992; Haskell, 2001). The current study identified a number of factors which are important to teaching and learning for transfer and which were not adequately addressed within the courses. These included:

- the prior learning and experiences of learners;
- the expectations of learners;
- current work and life situations;
- multiple examples (with diverse contexts); and
- future (and diverse) applications of the learning.

There is a groundswell of support for using authentic and personally meaningful situations to foster deep learning and transfer of learning. The current study provided strong support for the creating of opportunities for learners to actively engage in shaping their own learning. Deep learning occurred when the course enabled the students to integrate their learning and their living through the use of real work problems and situations. It is acknowledged that such an approach requires more effort from all parties than does the current situation.

An increased focus on transfer needs to be built on evidence from practice, and specifically from evaluations of the after-course experiences of students. The current gap is in knowledge and understanding of both the contexts in which learning will be applied, and of the experiences of the students when they come to apply their learning some time following the course. Design and delivery of the courses such as the B.Bus would be enhanced if they were informed by evidence from such evaluations.

Bransford and Schwartz’s PFL approach shares in common with traditional approaches to education an emphasis on the necessity of solid content knowledge and understanding of underlying principles. Where it differs is in its “knowing with” perspective which requires learners to notice and interpret. In the learning context, learners are encouraged to generate their own thoughts on problems and then to compare those to the thoughts of experts and others. The PFL approach emphasises the importance of learners learning how to ask appropriate questions, being able to reason, and engaging in reflective thinking. Learners need to be provided with exemplars of effective questions, of engaging in reasoning (for example, the think aloud protocols of

cognitive apprenticeships), and of reflective thinking. The challenge for distance educators is to provide feedback and guidance to students in their own attempts at asking questions, reasoning, and thinking reflectively.

The apparent failure of transfer of learning from educational contexts to different settings is in part a consequence of the lack of connection between the initial learning situation and potential transfer situations. The use of experiential learning approaches enables the integration of learning and living. The student is facilitated in integrating what is learned into their everyday practice. Habits such as self-management and critical reflection are cultivated within authentic out-of-course contexts. Such experiences are in keeping with Bransford and Schwartz's (1999) Preparation for Future Learning (PFL) approach to transfer, in that the learning experiences are critical, and based on authentic problems which typically require new learning. In such approaches transfer of learning also involves additional learning from others (such as colleagues), and these experiences nurture the internalisation of learning, thus making it more accessible for future situations.

The view of transfer that emerged from the study could be termed "learning for transfer". In this view, the initial learning experience(s) shapes the potential for transfer. This occurs on a number of levels. The existing knowledge schema the learner brings to the situation filters the new knowledge while being transformed by it. If learning within a course is shaped around authentic applications and future transfer then that is how the knowledge will be encoded and how it will be available in the future. On another level there is the preparation for future transfer which is about developing metacognitive awareness and the skills of learning to learn (which are mirrored by the skills of learning to transfer). Associated with these are the dispositions, or the dispositional knowledge, which are required for transfer – "the spirit of transfer".

Concluding remarks

In conclusion, this study supported the reconceptualisation of transfer as preparation for future learning, and demonstrated that distance education facilitates transfer through enabling the integration of learning and living. The findings recognised the importance of addressing transfer of learning as a core outcome to be explicitly addressed in the development, delivery, and evaluation of all educational courses and programmes. Transfer is crucial to understanding learning, and vice versa.

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