Practice Guided by Research
in Providing Effective Student Support Services

Terry Anderson

Despite the rapid increase in both participation and expenditure in various forms of e-learning, there has been very little sustained research that successfully informs practice in this area. This chapter examines the current problems related to funding and support for this research. It then examines the two major research methodological paradigms – qualitative and quantitative – and notes the problems each has in producing research results that really effect e-learning student support practice. The chapter concludes with a description and a call for a new type of research methodology known as design–based or developmental research. This methodology is demonstrated with a case study example of call centre use in providing student support services. The chapter argues that design based research with its inherent collaborative, integrative and iterative research model offers a methodology appropriate for and capable of improving the quality and quantity of research in this important area.

Introduction

Technical progress and the research that has enabled and supported its developments have fundamentally changed most aspects of daily life for the majority of humans alive during the start of this 21st century. But how has research been harnessed to change educational activity and specifically that delivered at a distance? In this paper, I argue that education generally and especially the newer forms that are sustained on the networks do not take advantage of sustained research and thus the potential contribution of networked learning is severely compromised. There are many reasons for this failure related to funding, the complexity of educational context and most fundamentally to the lack of an educational research culture amongst educators, learners, government policy makers and private sector players. I examine some of the reasons for this failure with specific focus on research methodologies that inform and influence practice related to the provision of learner services that are delivered at a distance. I argue that we need to recommit to the research endeavour. This includes increasing our production and consumption of relevant research using traditional qualitative and quantitative paradigms, but as importantly we need to develop new research paradigms that bridge the gap between scholarship and practice so as to make fundamental improvements to the quality and cost effectiveness of these services.

Defining Research

In my daily life as a Canadian Research Chair (CRC), I come across many understandings, definitions and practices of the activity and process referred to as "research". For example, computer programmers who work with us constructing Learning Objects Repositories often refer to their work as *research*, especially in discussion with funders; yet, their work is not driven by theory and their *results* will not be published in peer-reviewed journals. On the other hand, when in more academic circles, we restrict our use of the term to refer to those activities related to learning object use that are directly related to a

substantial theory base and the data collection and discussion emanates directly from empirical data collection. We also engage in more reflective discourse about the nature of teaching and learning in mediated contexts, using these same object repositories and use words with many syllables – and we refer to this as 'research' as well. Finally, we see end users searching our repositories for objects to use in course development and class presentations who consider themselves to be 'researching' the topic. It is clear that we do not all share the same understandings of the term.

In the face of such diverse usage of a single term, I flee to Google and its new Define: function to find 31 definitions of the word "research" in common use on the net. From these one can extract adjectives describing research as an activity that is disciplined, organised, transparent, problem orientated, public, creative, scientific, systematic, diligent, laborious and accessible. A more common dictionary definition is "… the systematic investigation into and study of materials and sources, etc., in order to establish facts and reach new conclusions" (Swannell, p. 919). So one sees that there isn't any distinction that says that research is conducted only by academics, by PhD's, by grant funded recipients, or by those seeking to publish their results in refereed scholarly journals. Neither is there a sense that research must be of a quantitative or qualitative nature nor that any one type of research is privileged over any other – yet as we will see later, this is far from the way that research is valued by either funders or consumers.

Thus, there is no particular set of procedures or a particular community of practice that has a proprietary definition of "research". I can, however, suggest a few shared properties. Glassick, Huber & Maeroff (1997) and his colleagues when writing about the scholarship of teaching describe all research as characterised by clear goals; adequate preparation; appropriate methods; significant results; effective presentation and reflective critique. In the paper that follows I try to apply these criteria to a sampling of learner support research.

Defining Student Services

Moving next to a clarification of what is meant by learner services leads to an interesting Atlantic Ocean divide. To most North American's, learner services encompass all of the functions of a formal learning institution that are designed to help and assist learners, but the actual teaching or functions relating to the discipline of study are explicitly excluded. For example Dirr (1999) includes in his survey of learner services a variety of non-academic interactions that the student has with a college or university, including: pre-enrolment services (recruiting, promotion, orientation), admissions and registration, academic advising, program planning, degree and transcript audit, technical assistance, library and bookstore services, personal and career counselling, social support services, and financial planning and management. But note that the actual teaching or academic and discipline related tutorial support is explicitly excluded from the list. By contrast Thorpe from the British Open University defines learner services "…. as all those elements capable of responding to a known learner or group of learners, before, during and after the learning process" (Thorpe, 2001, p. 4) and expressly includes the provision of academic support provided by tutors and teaching faculty. Given that we are this morning on the eastern side of the Atlantic, I will go with the much wider and exclusive definition that includes the important academic teaching function.

Why Conduct Research on Learner Services?

Putting the definitions of research and student services together raises the obvious question of just why research is important or more directly for this audience is what can it do for those involved in learner services? The answer to this question has two components. The first is to consider the very many facets of learner services to in which our knowledge is lacking and thus the ways in which our involvement in its provision is compromised. I am sure that many of you could provide a list of issues that are relevant to your practice and that have important consequences both to the lives of learners and to your institution's capacity to serve, to which your knowledge is at best untested and uninformed and at worst incorrect. These issues probably include traditional distance education questions such as how to reduce attrition, improve learning outcomes, and reduce the cost of services. But, now we are challenged to provide answers to questions raised by new forms of distance education provision, questions such as:

- Just what mix of personal and machine delivered services is needed by learners?
- What combinations of collaborative and group based learning are worth the cost and inconvenience to both teachers and learners?
- Do face to face tutorials really make a difference or is real time video conferencing just as effective?
- Is travelling to a learning centre worth the expense and hassle when we can cost effectively deliver via audio and video to the home or workplace?
- How much does expensive multimedia really enhance student learning; how important are real time interactions compared to asynchronous ones.

The list is long and growing.

It is even more important to ask ourselves if our current research practice is capable of answering these questions. At the recent ICDE conference in Hong Kong, I was on a panel session focused on distance education research. One of the audience members challenged the panel to name one result from distance education research that had really made a difference to practice. It was embarrassing, how long it took both the panellists to come up with some answers. Can you think of an example of where research has informed or guided your practice?

Why Educational Research 'Don't Get No Respect'

The American comedian Rodney Dangerfield is famous for his tag line lament that he "don't get no respect" – a sentiment with which most of us in educational research empathise. Compared to our colleagues in many other disciplines, our research is neither valued (by educational practitioners, potential sponsors or our research colleagues) nor well funded. The growing list of important questions just iterated leads to questions as to why we haven't done more and a related question of why is it that educational research has not made the contribution to practice that has research in engineering or health care. An easy answer is to blame the lack of public or foundation funding for educational research. Although governments in most developed countries spent only slightly less on education than on health, the discrepancy in amounts spent on research in these respective fields is large and growing. The amount spent in North America on educational research is estimated to be about .01% of total educational expenditures

(Burkhardt & Schoenfeld, 2003). Health researchers set a goal of 3% or 30 times as much for basic and applied health research. This can be compared to other high tech information business that typically spent 15-20% of their turnover on research. To put this in perspective one multinational pharmaceutical company, Pfizer, claimed that in 1999 they spent over 200 million dollars of their 20 billion dollar research budget on research related to treatments for animals – a sum that is nearly 7 times as much as the US government spends on educational research (Smithsonian, June 1999 cited in Burkhardt & Schoenfeld, 2003, p. 3). It is obvious that educational research suffers from an extremely impoverished funding base as compared to related social and private enterprises. But is that a cause or merely a symptom of research productivity?

In a recent Educational Researcher article Burkhardt and Schoenfeld (2003) list a number of barriers that they believe inhibit the productivity of educational research. The first barrier is that it is no one's job to turn research insights into effective practices. Researchers consider their job complete when their work is published and their granting agency audit is passed. Most practising distance education teachers and practitioners are so overwhelmed with the demands of continuing growth that they feel they have little time for studying research that may or may not meet immediate needs. Secondly, as researchers, we are very inexperienced and suffer a poor track record of working collaboratively on large-scale problems. Where is the educational equivalent of the Human Genome project or even the frantic effort to prove or disprove an educational claim similar to the effort that resulted from the claim of discovery of cold fusion? Unlike in disciplines like physics or medicine, a new discovery does not result in immediate focus of attention on verifying, supporting or refuting initial results. More often than not, I have been surprised by the deafening silence that results from publication of my own research results as from any informed discourse and public search for application and implementation. Perhaps this is only an indication of the value of my own research, but I think this is an experience shared by most educational researchers. Burkhardt and Schoenfeld (2003) also note the lack of an industry that is poised and eager to both support and later to implement and benefit commercially from educational research. The nearest we have to such a commercial base is the book publishers and they have almost a negative incentive to support or exploit research work that investigates substitutes for paper products or that otherwise changes the current nature of the educational system. They also note that there are no "consumer reports' that compare the effectiveness of one educational product or innovation to another and thus there is little bottom line incentive to improve products to keep ahead of potential competition. Finally, and perhaps most critical is the lack of a research culture within our practice. Unlike health workers, little long-term record keeping or systematic evaluation is done of our performance in learner support and when such record keeping is demanded, it is often treated as a burden rather than an opportunity to enhance professional practice. Further, there is a pervasive sense of mistrust and lack of confidence in educational research capacity to make a difference that either improves learning or makes life more satisfying for either learners or practitioners. In brief, we lack a sustaining research culture.

I next turn to a brief look at the types of research methodologies employed in learner support to see if the way in which research is practised and the types of questions which it addresses could be a related cause in our failure to develop a culture of research.

Education research borrows and adapts research paradigms and tools from many other disciplines. These are often classified into three broad types – a scientific or positivist paradigm; a qualitative or interpretative paradigm and an emerging developmental or engineering paradigm. I will briefly overview these paradigms and illustrate them with examples of recent work in the paradigm related to learner support.

The Scientific Paradigm

This research tradition comes from the natural sciences and has had a long series of successes at informing our understanding of the natural world. This research paradigm traces its focus on observable behaviour back to Descartes who wrote in the 17th century that "… those who are seeking the strict way of truth should not trouble themselves about any object concerning which they cannot have a certainty equal to arithmetic or geometrical demonstration" (Descartes, as cited in Lines, 2001, p. 172).

The focus on that which can be consistently measured has evolved to a set of procedures that culminate in the random assignment of learners to treatment groups and the blind evaluation of results of these interventions. Since education is deeply contextualised, a single experiment is always suspect and thus the best research in this paradigm is replicated in many contexts and the results are amalgamated in processes known as a meta-analysis. In our field three such meta analysis have been reported during the past year. In the first Bernard et al. (in press) and his colleagues at Concordia University sought to compare learning outcomes between those who studied at a distance and those who were enrolled in campus based programs. They examined 2,262 studies that had taken place between 1990 and 1999, but berate the fact that only 232 met their requirements for a control group and only a small fraction of these had rigorously used random assignments to these groups. A second study by Ungerleider and Burns (2003) looked at networked learning trails from the year 2000 to the present but found only 25 studies that used comparison groups and of these "only 10 of the 25 studies included in the in-depth review were not seriously flawed, a sobering statistic given the constraints that went into selecting them for the review. Studies were commonly flawed either in design, statistics, or interpretation" (p. 33). Both research teams spoke very critically of the quality of educational research and made calls for dramatic increases in the types of research that could be used to create what is often referred to as 'evidence based' results. In fact, this call has been answered by the Americans who promise in their 2003 federal education plan to increase their funding of 'evidence based research' from 7 to 70% (Slavin, 2002).

But what did these research results tell us? In the two studies referred to, these meta-analyses found no significant differences between those studying in classrooms and those at a distance. I should also mention a third meta-analysis done by Shachar and Neumann (2003) that did find a small positive increase in learning outcomes in favour those learners studying at a distance. But what if the results had shown very significant results in favour of either mode of delivery? Would they have informed our practice? I think the answer would be a resounding "Not very likely". The meta-analysis tells us nothing about the critical context in which the learning took place. What learner support services were in place? What was the quality of the teaching or of the content? What was the condition of the home study or the class environment – the list of contextual factors goes on and on. Thus, one can conclude that this gold standard – the use of

randomly assigned comparison group research and subsequent meta-analysis is of only limited use to practising distance educators. These results may be useful in persuading reluctant colleagues or funders about the efficacy of distance education, but they tell us little that will help us to improve our practice.

Despite this problem, many very influential policy makers are now arguing that unless education adopts this type of "scientific and evidence based research", we will never make progress in the discipline and will be subject to fads and superstitions forever. The famous American education researcher Robert Slavin (2002) contributed to a major revival of the paradigm wars of the 1980's recently when he argued that educational researchers need to embrace "evidence based learning" rather than the current process that "more resembles the pendulum swings characteristic of art or fashion, rather than the progressive improvements characteristic of science and technology" (p. 16). This plea has fallen on fertile ground in many government circles.

It is not that I am unsupportive of this latest research fad that supports only quantitative and random comparison studies, rather I think that believing that this and only this type of research is either effective or capable of informing policy makers and practising educators is both naïve and unhelpful in garnering the respect and support we most sorely need.

Qualitative or Interpretive Learner Support Research

The majority of research published in distance education can broadly be classified as qualitative or of mixed design. Rourke & Szabo (2002) in a content analysis of the Journal of Distance Education classified the research articles as:

31% qualitative

25% quantitative

31% qual & quant (mixed)

Qualitative studies include case studies, interpretive ethnographies, grounded theory, phenomenological studies and a variety of other variations on a research paradigm that seeks to understand and explain practice from the participants' perspective. This research is usually more easily read (unless it is 400 pages long) and comprehended by practising educators but it too has difficulty showing that it has effect on distance education practice. A recent qualitative study by Dearnley (2003) of students studying at a distance towards their Nursing Degrees illustrates this point. She argues that "… support structures to facilitate personal and professional development within this context need to be in place and attention must be given to the provision of effective learner support" (Implications section, para. 3). These are nice sentiments to which few would disagree. However, an examination of a graphic illustrating the life process of students engaged in this program (figure 1) leaves me with little sense of how we could change or improve our learner support interventions – though again, the study has some value in revealing to us the life forces in effect among this group of learners.
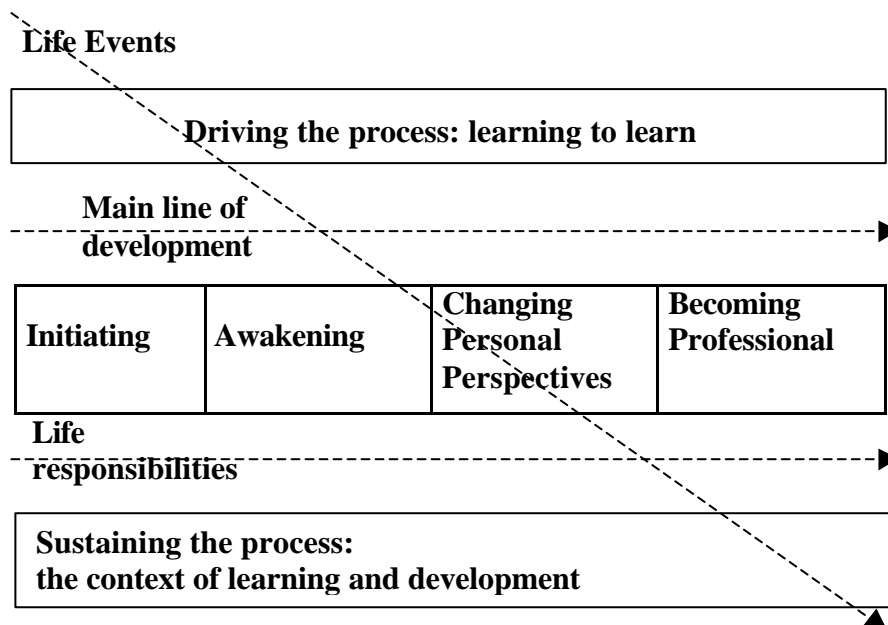
Life Events

Driving the process: learning to learn

Main line of development

| Initiating | Awakening | Changing Personal Perspectives | Becoming Professional |

Life responsibilities

Sustaining the process:
the context of learning and development

Figure 1: Distance Learner Development from Dearnley (2003)

A second study by Cain, Marrara & Pitre (2003) concluded from interviews with eight graduate students studying at a distance that most of the students had no interest or desire to utilise any learners support services other than those provided by their teacher. These types of findings do little to inform or change our practice, at best they leave us with the conclusion to most questions that "it depends" – an answer that most of us know already about learner support provision in distance education. Burkhardt and Schoenfeld (2003) note that the test of quality in much qualitative study is "… critical appraisal concerning plausibility, internal consistency and fit to prevailing wisdom. The key product of this approach is critical commentary" (p. 5). Such commentary by researchers that is produced and often consumed only by fellow researchers does little to directly change or improve practice.

Developmental or Design-based Research

A third paradigm of research design is related more directly to the practical discipline focus of engineering and architectural study and work. This genre of research has yet to converge on a single name, but is most often referred to in North America as design-based research. The term "design-based" is generally attributed to the American Researcher Anne Brown from a 1992 article in which she described the challenges of undertaking real life research in classroom contexts. However, the concept is very directly related to the work on van den Akker (1999) and his Dutch colleagues and to Richey, Klein and Nelson (2003) who write about a set of practices that they refer to as 'development research' with a particular focus on construction and evaluation of technological learning prototypes. Design-based research has garnered a great deal of attention within the last

year with special editions of the Journal of the Learning Science (13,1, 2004) and the Educational Researcher (32,1, 2003) dedicated to this emerging research paradigm.

I am particularly attracted to what I will refer to as design-based research because it, like many distance educators, is action and interventionist orientated, participant centred and collaborative. Unlike many forms of qualitative research it goes beyond understanding the context from participants' perspective to actively working with participants to improve, assess and re-design the critical educational context in which learning happens. Moreover, it is unlike quantitative designs in that the researcher is not merely measuring – rather they actively and consistently intervene to iteratively design, redesign and measure variables that are interesting both to themselves and to their practitioner collaborators. In many ways developmental and design-based research are our only homegrown educational research contributions. In the way that anthropologists developed ethnography, educators developed developmental research. Finally, unlike many forms of action research that tend to ignore theoretical development or implications, design-based research also strives to generate, substantiate and improve theoretical constructs that can "… transcend the environmental particulars of the context in which they were generated" (Barab & Squire, 2004, p. 5)

I would next like to provide an example of a design-based study that we are beginning that is focused on an installation of call centres at Athabasca University. I must confess however that this study is emerging from a project that was begun, before I arrived at Athabasca University and thus an example of "building airplanes in the air".

To set the context let me describe the undergraduate business programs at Athabasca University. This program is our largest undergraduate program enrolling over 11,000 students annually. Unlike many distance education programs globally, the distances from which our students enrol and their low concentration in any one location precludes any face-to-face interaction. In addition, these are continuous intake programs in which a student can enrol at any time and can progress through the course at their own pace. Traditionally at Athabasca the first line of student support has been telephone or more recently email interaction with a tutor. These tutors are 'on-call' for two hours a week for telephone interaction and respond to emails within 48 hours. The intervention introduced in 1994 was to create a call centre, modelled on those that have become the mainstream means of customer support in business within the last decade. Three call centres now operate at Athabasca (a general information centre, a computer help desk and a tutorial service within the School of Business) and the operational details of each are similar. Instead of having one day a week in which students can talk with a tutor they can now call or email 60 hours a week and talk, not to a specific tutor, but to an undergraduate business advisor. This advisor likely does not know the student personally but unlike the tutors, they do know Athabasca University Business school – its courses, curriculum, administrative requirements and the answers to questions that students enrolled in the business courses have been asking over the past 10 years. As Phillips and Hawkins (2003) report from the Open University of the UK it is extremely challenging to keep part time tutors informed and knowledgeable about the policies of the University even when this type of administrative information is reported as the most important type of learner services support (Cain, Marrara, & Pitre, 2003). Of course, not all academic questions can be answered by a general advisor not specifically trained in the discipline of study. However we have found that approximately 80% of students' queries are answered

immediately by the advisors and the rest are referred for response within 48 hours by academic experts. Further, we have found that student satisfaction with the call centre service is high and that this innovation saves the School of Business saves over $100,000 a year (Woudstra, Huber & Michalczuk, 2004). But what has this to do with design-based research?

I would next like to illustrate how a design-based research design is used to provide meaning and hopefully valuable practical and theoretical assistance to practitioners both within and beyond Athabasca University. To do so, I would like to use a model of design-research developed by Bannan-Ritland (2003). Figure 2 provides a diagram illustrating the components and the use of various research methods and data in a design-based research study.

Figure 2

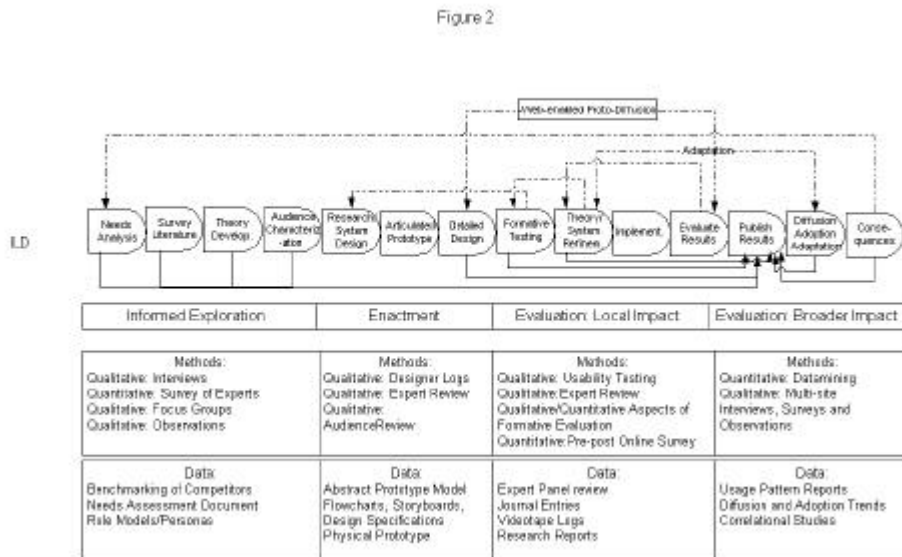| Informed Exploration	Enactment	Evaluation: Local Impact	Evaluation: Broader Impact
Methods: Qualitative: Interviews Quantitative: Survey of Experts Qualitative: Focus Groups Qualitative: Observations	Methods: Qualitative: Designer Logs Qualitative: Expert Review Qualitative: AudienceReview	Methods: Qualitative: Usability Testing Qualitative: Expert Review Qualitative/Quantitative Aspects of Formative Evaluation Quantitative: Pre-post Online Survey	Methods: Quantitative: Datamining Qualitative: Multi-site Interviews, Surveys and Observations
Data: Benchmarking of Competitors Needs Assessment Document Role Models/Personas	Data: Abstract Prototype Model Flowcharts, Storyboards, Design Specifications Physical Prototype	Data: Expert Panel review Journal Entries Videotape Logs Research Reports	Data: Usage Pattern Reports Diffusion and Adoption Trends Correlational Studies

Figure 2: Relationship between stages of the Integrated Learning Design Framework and types of methodology and data collection from Kelly & Lesh (2003)

In this diagram Kelly and Lesh track the four main areas of design research – informed exploration; enactment, evaluation in the local context and finally more general evaluation on a broader scale. They break these four main stages into smaller steps, many of which are familiar to educational researchers. Three things are striking about this diagram. First is the integrative and connected way in which one phase of the design-based research leads to another and that the whole of the research is not complete until the project has worked through all these phases. Much current research reported in our journals is confined to perhaps a needs assessment, a report of an intervention, and the results of a pilot implementation or a wider scale meta-analysis of adoption impact; – design research covers all of these domains and more. Secondly, note that Kelly and Lesh provide examples of the type of methods and data that are collected across each stage of the design process. Here you see qualitative questions, methods and data mixed with those emerging from a quantitative paradigm. Each data set and analysis informs the other. Finally note

9

how each phase includes the active participation of both researchers and field based practitioners.

Returning now to the call centre project at Athabasca, I illustrate how each phase has or will be incorporated into a design-based research design of this intervention. In the informed exploration stage, call centre theory and practice were reviewed and studied in their mostly consumer support applications. Interviews were undertaken with some of the key actors and other sorts of qualitative data were collected. In the enactment stage the Lotus Notes applications was constructed. Unfortunately, we didn't gather as much data on the production as we could have and thus there is little data detailing costs, timelines, and design specifications. Such data loss inevitably results in less capacity for the innovation to be replicated elsewhere. Finally, pilots were conducted and results monitored on pilot study and regular students. The evaluation stage consisted of more quantitative data collection. First and most importantly all calls (from telephone as well as email) are tracked in a database. This database can be searched and interrogated by faculty and administrators online using a web browser, thereby allowing faculty to monitor, on a continuing and on needed basis, the type of interactive questions, queries and concerns of their current students. This data can also be monitored over successive years thus gathering longitudinal data that can further inform our practice. This source of data is in marked contrast to the 'black hole' in which student interactions with tutors fell into in the past. Previous to the call centre, it proved a very challenging task to gather comprehensive data related to frequency, content and solution to student concerns.

In the local evaluation stage of the design-research annual evaluations of student satisfaction with learner support services are analysed to differentiate between students with traditional tutors and those assigned to call centres. These studies reveal that there is little difference in over all satisfaction. However, it should be noted that some students (and tutors) miss the familiarity that they were used to with a single tutor assigned to a restricted number of students. The final broader stage impact is achieved by ongoing publication of results (Woudstra, Huber, & Michalczuk, 2004; Woudstra & Adria, 2003; Adria & Woudstra, 2001).

We have also learned that the call centre is a disruptive technology. Some of the tutors and their union have expressed concerns that their jobs have been reduced in scope and in resulting compensation. Currently the call centres handle 80% of student concerns and only 20% of the questions are passed on to academic experts for reply. These and other questions are of course monitored, the time for resolution tabulated and the answers are made available for both tutors and call centre advisors in a frequently asked question file. Further design-research work is needed to monitor the effect of this innovation on long term completion rates, academic outcomes and the effect on working conditions of academic, tutors and advisory staff. The data collection incorporated into the system also encourages practitioners to monitor their own work. It provides a ready tool for the development of action and more theoretical research questions and projects since staff are able to easily monitor the effect on student queries of any further innovation on any part of the educational system that directly impacts students. Finally, it is hoped that publication of the research results will result in replication in different contexts, allowing further study and innovation development as the results of these innovations are shared throughout the distance education community.

In summary, design based research provides a path that leads away from the unproductive paradigm wars that threaten to break out once again within the educational research community. The vitriolic nature of the argument between advocates of competing research paradigms marginalises, stereotypes, separates, and backgrounds competing positions. Lines (2001) argues that we "… been seduced into accepting the inherent value and power differentials that operate in the dualist construction of the 'quantitative/qualitative' binary pair of terms" (p. 173) and that this confrontational attitude is highly unproductive for those seeking further support for educational research. Harkening back to the extremely low amount of funding currently available for educational research reminds me of the old saying that 'within academia the acrimony of debate is so high because the stakes are so low'.

There is no one correct way to conduct research. Each methodology has particular strengths and weaknesses, works better with different problems and better suits the culture and personality of different researchers and the context in which they work. But there is no inherently superior methodology either. In a very interesting study, Kennedy (1999) asked a group of practising teachers to evaluate research papers that used a variety of methodological designs on a wide set of criteria including usefulness, understandability and potential impact on their practice. She concluded that "… the findings from this study cast doubt on virtually every argument for the superiority of any particular research genre, whether the criterion for superiority is persuasiveness, relevance, or ability to influence practitioners' thinking" (p. 26).

Finally, I should note the variety of ways in which the Net is changing educational research. Anderson and Kanuka (2002) document the many ways in which the Net both facilitates traditional and allows new ways to examine learner behaviours in educational contexts. We conclude that new net tools can be used to research not only online behaviour but also very effective tools to survey and interview subjects engaged in non-net based educational activities.

The Dissemination of Research and Best Practices

Even the best of research is of little value unless its results and recommendations reach the busy practitioners who are in a position to implement the findings and best practices revealed. Traditionally, this has been done through paper journals, conferences and more recently via email discussion lists. The cost of travel and inconvenience of travel limits the effectiveness of face-to-face conferences. Virtual, real time conferences have their place, but the demands of real time obligations limit their effectiveness for practitioners. Further, conferences provide a type of information that might be described as 'hit and miss, just in case' that only coincidentally meets immediate needs. Mailing lists are also useful but their proliferation as well as the 'spam' that accompanies all useful email, limits their usefulness. Paper journals and especially those published by for profit publishers are increasingly too expensive for many of the world's distance education practitioners – although access through databases such as EBSCO is an encouraging sign.

At the risk of being accused of self aggrandisement, the model of publishing high quality peer reviewed research articles and technical reports and making these articles available to all, such as is the practice of the journal that I edit, is the most cost effective and accessible way to encourage meaningful dissemination. Athabasca University's journal the International Review of Research on Open and Distance Education (IRRODL)

is possibly the most widely read of the peer reviewed journals. I am also pleased to see the developments of Europe's International Research Foundation for Open Learning with one of the core functions being the dissemination of research results as well as training practitioners and researchers. I especially am pleased to read about the upcoming publication of a series of online handbooks for researchers to be published in conjunction with the Commonwealth of learning. Yet another example of the value of open source type distribution of research results and best practice is the recent publication by Anderson and Elloumi (2004). 3700 copies of this 17 chapter book were downloaded during the first two weeks in which the e-book was placed online. This number compares very favorably with the 2,000 copies of Anderson & Kanuka (2002) – many of which still sit in the virtual sales racks of Amazon.com.

However, even the best of articles gets lost in a sea of electronic information and is too often forgotten by busy researchers and distance education practitioners. We need to develop systems that allow for qualifying, organising, and harvesting research data and summary articles. The emerging semantic web (Berners-Lee, Hendler, & Lassila, 2001) offers promise to meet this need. A first step towards this goal has been done recently with the publishing of all IRRODL documents in (rich site summary) RSS format. Although a simple system, the XML coding of four important fields (title, author, abstract and link to the full text) in RDF format to create the RSS feed is a first step in allowing content to be stored and harvested selectively by both machines and by people. In further work we have recently been working on ontology of educational research terms that we hope will provide a much richer means to identify and retrieve articles from throughout the educational world. Applying and growing the metadata that describes not only the results of individual research projects but metadata that grows in an organic fashion as it informs and is further informed by practice and later research is a looming challenge that we are just beginning to understand. The Educational Semantic Web does not yet exist but my experiences editing with Denise Whitelock a special issue of the Journal of Interactive Media (2004) (www-jime.open.ac.uk) convinces me of the potential value of this technology – despite the considerable obstacles yet to be overcome.

Conclusion

To conclude let me reiterate that we desperately need an increase in both the quality and the quantity of educational research and especially that devoted to learner services. Further, this research must involve and be co-directed by practitioners so that the results inform and inspire practical improvements. To achieve this goal we need to fight much less about the various research paradigms that are available and learn to integrate all research paradigms – extracting value and meaning from each as it provides effective tools to answer our many problems. The emergence of developmental or design-based research seems to offer a promising new methodology that can effectively use all research methodologies in a process that follows interventions through from literature and theory research, to multi-mode data collection to implementation and adoption studies. The development of such a methodology gives promise for the creation and sustenance of a vibrant research culture in distance education. Cultures are not formed quickly, but once established and nourished they provide the sustaining impetuous for collective action that is so desperately needed in our mission of providing quality educational opportunity to every inhabitant of our global home.

Reference

Adria, M., & Woudstra, A. (2001). Who's on the line? Managing student communications in distance learning using a one-window approach. *Open Learning, 16*(3), 249-261.

Anderson, T., & Elloumi, F. (2004). (Eds.). *Theory and practice of online learning.* Athabasca CA: Athabasca University. Retrieved May 20, 2004, from http://cde. athabascau.ca/online_book

Anderson, T., & Kanuka, H. (2002). *E-Research: Methods, strategies and issues.* Boston: Allyn and Bacon.

Bannan-Ritland, B. (2003). The role of design in research: The integrative learning design framework. *Educational Researcher, 32*(1), 21-24.

Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. *The Journal of the Learning Sciences, 13*(1), 1-14. Retrieved June 21, 2004, from http://website.education.wisc.edu/kdsquire/manuscripts/jls-barab-squire-design.pdf

Bernard, R. M., Abrami, P., Lou. Y., Borokhovski, E., Wade, A., Wozney, L. W. P. A., Fiset, M., & Huang, B. (in press). How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research,* Retrieved January 18, 2004, from http://doe.concordia.ca/cslp/frameset/ cslpprojects.html.

Berners-Lee, T., Hendler, J., & Lassila, O. (2001, May 17). The semantic web. *Scientific American*, (43 para.). Retrieved February 20, 2004, from http://www.sciam.com/ article.cfm?articleID=00048144-10D2-1C70-84A9809EC588EF21.

Burkhardt, H., & Schoenfeld, A. (2003). Improving education research: Towards a more useful, more influential and better-funded enterprise. *Educational Researcher, 31*(7), 15-21. Retrieved Feb. 23, 2004, from http://www.aera.net/pubs/er/pdf/vol32_09/ ERv32n9_pp03-14.pdf.

Cain, D., Marrara, C., & Pitre, P. (2003). Support services that matter: An exploration of the experience and needs of graduate students in a distance learning environment. *Journal of Distance Education, 18*(1), 42-56.

Dearnley, C. (2003). Student support in open learning: Sustaining the process. *International Review of Research in Open and Distance Learning, 4*(1), 52 para. Retrieved January 26, 2004, from http://www.irrodl.org/content/v4.1/dearnley.html.

Dirr, P.J. (1999). *Putting principles into practice: Promoting effective support services for students in distance learning programs: A report on the findings of a survey.* Boulder CO: WICHE. Retrieved February 22, 2004, from www.wiche.edu/telecom/ Projects/studentservices/

Glassick, C., Huber, M., & Maeroff, G. (1997). *Scholarship Assessed: Evaluation of the Professoriate*. San Francisco: Jossey-Bass.

Kelly, A. E., & Lesh, R. A. (2003). *Design-based research methodologies.* Retrieved February 26, 2004, from http://gse.gmu.edu/research/de/figure2.htm

Kennedy, M. (1999). A test of some common contentions about educational research. *American Educational Research Journal, 36*(3), 511-541. Retrieved January 6, 2004, from http://ed-web3.educ.msu.edu/digitaladvisor/ResearchFiles/Articles/contentions.pdf

Lines, K. (2001). A philosophical analysis of evidence-based practice in mental health nursing. *Australian and New Zealand Journal of Mental Health Nursing, 10*(3), 167-174. Retrieved January 8, 2004, from http://www.blackwell-synergy.com/links/doi/10.1046/j.1440-0979.2001.00207.x/abs/.

Phillips, A., & Hawkins, R. (2003). Blending the mix: The provision and integration of students support services in the networked age. *Open Praxis, 1*, 7-13.

Richey, R., Klein, J., & Nelson, W. A. (2003). Developmental Research: Studies of instructional design and development. In D. Jonassen (Ed.), *Handbook for research on educational communications and technology* (pp. 1099-1130). Hillsdale, NJ: Lawrence Erlbaum Associates.

Rourke, L., & Szabo, M. (2002). A content analysis of the journal of distance education. *Journal of Distance Education, 17*(1), 38 para. Retrieved February 23, 2004, from http://cade.athabascau.ca/vol17.1/rourke.html

Shachar, M., & Neumann, Y. (2003). Differences between traditional and distance education academic performances: A meta-analytic approach. *International Review of Research on Distance and Open Learning, 4*(2), 51 para. Retrieved May 12, 2004, from http://www.irrodl.org/content/v4.2/shachar-neumann.html

Slavin, R. (2002). Evidence-based education policies: Transforming educational practice and research. *Educational Researcher, 31*(7), 15-21.

Swannell, J. (Ed.). (1992). *The Oxford modern English dictionary*. Oxford, UK: Clarendon Press.

Thorpe M. (2001). *Learner support: A new model for online teaching and learning*. 20th World Conference ICDE (14 p.). Retrieved January 4, 2004, from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.rtf

Ungerleider, C., & Burns, T. (2003). *A systematic review of the effectiveness and efficiency of networked ICT in education* (68 p.). Ottawa: Industry Canada. Retrieved January 24, 2004, from http://www.lnt.ca/technology/ict/SystematicReview.pdf.

Van den Akker, J. (1999). Principles and methods of development research. In J. J. van den Akker, N. Nieveen, R. Branch, K. Gustafson, & T. Plomp (Eds.), *Design methodology and developmental research in education and training* (pp. 1-14). Dordrecht, NL: Kluwer Academic Publishers.

Woudstra, A., & Adria, M. (2003). Organizing for the new network and virtual forms of distance education. In M. Moore (Ed.), *Handbook of distance education* (pp. 531-47). Mahwah, N.J.: Lawrence Erlbaum Associates.

Woudstra, A., Huber, C., & Michalczuk, K. (2004). Call centers in distance education. In F. Elloumi & T. Anderson (Eds.), *Theory and practice of online learning* (pp. 295-319). Athabasca: Athabasca University Press. Retrieved February 22, 2004, from http://cde.athabascau.ca/online_book