

Supervising Undergraduate Research Using Online and Peer Supervision

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MacKeogh, Kay 2006 Supervising undergraduate research using online and peer supervision. In M. Huba (ed) 7th International Virtual University Conference, Bratislava 14-15 December 2006. Technical University Bratislava: Bratislava. pp19-24

Abstract

This paper will review the role of the undergraduate dissertation as an essential element in the preparation of undergraduate students for research both at postgraduate level and in the wider community. The role and responsibilities of the research supervisor varies between universities, and there are many different styles of supervision. There is a need to strike a balance between the support for the novice researcher, and the development of autonomy and independence. Students studying at a distance from the campus present particular challenges with regard to supervision of research. The paper will outline the approach to research supervision adopted in a distance education psychology module, which combines online supervision, face-to-face meetings, and peer supervision. The paper will conclude with an evaluation of the outcomes.

1. Introduction

While there is a substantial literature on various aspects of undergraduate research dissertations, this literature has, to date, focused largely on students studying on-campus. Yet, students studying at a distance pose particular challenges in designing and providing appropriate supervision arrangements. Oscail, the National Distance Education Centre in Ireland provides a range of undergraduate and postgraduate programmes to adult students located throughout Ireland and abroad. A number of these programmes require students to undertake an independent research dissertation or thesis under the supervision of an academic. This paper will outline the way in which Oscail has adopted the potential of ICTs to provide an innovative approach to research supervision. The paper will first review the role of undergraduate research dissertations, before outlining the range of roles and responsibilities which supervisors are expected to undertake. The paper will offer a case study of supervision arrangements for the BA Psychology research module which combines elements of online supervision, peer supervision and limited face to face meetings. The paper will discuss the outcomes of an evaluation of this approach, and will conclude with some general

observations on the potential of this approach for other programmes, both on-campus and distance learning.

2. The Undergraduate Dissertation

The undergraduate dissertation is a feature of most, although not all undergraduate programmes in the UK and Ireland. Students in the final year of the three or four year Bachelor's degree are required to carry out a substantial piece of individual research (usually 10,000 words approximately). The dissertation is often described as the culmination of the degree programme; it consolidates the student's understanding of the discipline. It helps to develop a deeper approach to learning as students delve deeper into the topic through reviewing the current state of knowledge, identifying areas for further research, collecting and analyzing data, and writing up their findings. The dissertation demonstrates the students' capacity as independent and autonomous learners as they take responsibility for their topic and direct their research. Through their research, students acquire valuable transferable skills which will be of benefit to them in the world of work: problem definition, problem solving, project management, statistical and research skills, analytical and evaluative skills. Completion of the dissertation is an invaluable preparation for postgraduate research, and is also an indicator of the students' potential in this area. Finally, a number of professional bodies (such as the Psychological Society of Ireland) require students to carry out research dissertations as part of their undergraduate studies.

According to Todd et al (2004) the main characteristics of the undergraduate dissertation include: the student selects the topics (although there may be some restrictions on the degree of choice); the work must demonstrate individual effort, but there is always an element of supervision; the research involves a series of stages: selection of a topic, preparation of a research proposal, ethics approval, collection of data, analysis, and write up (although in some programmes, for example in the nursing field, students may not collect data due to ethical or logistical constraints); the dissertation represents a prolonged engagement with the work, often one academic year or

longer; and the dissertation fulfils a dual purpose in that it is both a learning tool and an assessment tool.

Despite the obvious benefits offered by the undergraduate dissertation, there are problems in providing the type of support needed to enable the student to produce a worthwhile and quality piece of work. With growing enrolments in higher education, and increasing student:staff ratios there are pressures on universities to abandon the dissertation in favour of less staff intensive methods of teaching. While the undergraduate dissertation is intended to be an exercise in independent research, in Hemmings' words 'Independence does not involve a hands-off approach. The challenge in the undergraduate dissertation is to provide sufficient support to cultivate autonomy while recognizing that many students may not feel fully prepared for this form of study... independent study needs to be developed over time and embedded within clear institutional and departmental policies that underpin and support a philosophy of developing independence in learning.' (Hemmings, 2001: 336).

The key to successful undergraduate research is therefore in meeting the need for support, while also setting the foundations for autonomy and independence. The responsibility for balancing these needs has, in the past, rested on the full-time academic staff in the universities. As will be seen, this is no longer feasible in many cases where there may be up to 200 students in a final year class, nor is it feasible in the traditional distance education setting with its reliance on part-time adjunct faculty. Before discussing alternative approaches, the next section will outline the traditional roles and responsibilities of the supervisor.

3. Role of the Supervisor

A review of the literature reveals a wide range of roles and responsibilities which supervisors are expected to carry. They have been variously described as: subject experts; gatekeepers of academic standards; resource person and advisor on the research literature, research methodologies; 'midwife' of the dissertation; director, project manager, shaper; scaffolder and supporter; editor; promoter of student self-efficacy. According to Rowley and Flack 'the supervisor needs to be continually learning about the student learning process, as well as developing their own subject knowledge, networks for access, ability to navigate electronic sources, and repertoire of research methodologies' (Rowley and Flack, 2004: 189).

Stefani et al (2004) outline the range of responsibilities of supervisors. Generally supervisors are responsible for assisting student to select topics which have clear and achievable aims. They must ensure that students will have

the necessary expertise, equipment, materials needed to carry out the research. They must provide guidance, advice, instruction, encouragement, support – but the work should reflect that of the student and not the supervisor. Crucially, the supervisor is also responsible for ensuring that the student understands and applies all relevant safety and ethical considerations. Finally, the supervisor acts as an examiner, providing both formative and summative feedback on the dissertation.

Supervisors vary considerably in the way in which they approach the supervision role. Anderson (cited in Jamieson and Gray 2006) found that supervisors could be placed along two continuums between active and passive, direct and indirect. Direct-active supervisors tend to initiate contact, perhaps setting up a schedule of meetings or contacts, and adopt a more directive role – telling students what to do and when; indirect-active supervisors welcome student contact, when the student wishes to make contact, and provides advice, asks for opinions, explanations, justifications; indirect-passive supervisors tend not to arrange meetings, and adopt a listening, non-directive approach, waiting for students to think things through and solve their own problems. Finally, passive supervisors tend to make no effort to influence the direction of the research, and remain largely unresponsive to the students' need and requests for assistance. Generally, in view of the need to balance support and autonomy, the indirect-active and indirect-passive approaches are deemed most appropriate for undergraduate supervision. As will be seen this approach has been recommended for supervision of Oscail undergraduate dissertations.

4. Oscail – Distance Education Students

All Oscail programmes are aimed at students studying at a distance from the campus. These students are unable to, or are not interested in studying on-campus for the normal range of occupational, locational, and personal reasons. The students are more diverse than full-time students, in terms of age, educational background, occupation, location, and personal circumstances. The traditional form of distance education with printed texts supported by face to face tutorials and telephone contact with tutors, which prevailed until the late 1990s, presented many constraints including social isolation, lack of interaction, and restricted learning resources in the form of libraries. However, since the late 1990s, with increasing access to PCs and the Internet in Ireland, it has become feasible to move to elearning methods to support our learners. Elearning through the open source Virtual Learning Environment, Moodle (see <http://moodle.org>) now provides the forum for social and intellectual interaction between students and tutors; it has expanded the range of

innovative pedagogical approaches, including peer learning and collaborative research, and also facilitates the development of higher order learning (Fox and MacKeogh, 2003; Lorenzi et al 2004). The expansion of online library databases providing access to full-text journals and subject portals and websites has increased to a considerable extent the academic resources available and accessible to students. These developments have greatly enhanced the facilities available to Oscail students, but have also raised the standards expected.

Prior to the initiation of elearning, Oscail research students faced particular difficulties in accessing not only supervision, but also the resources required to carry out their research. The next section will review the challenges encountered in supervising research at a distance, while outlining the solutions adopted in overcoming these challenges.

5. Supervision at a distance – Challenges and Solutions

Supervision at a distance presents many challenges, including: part-time adjunct faculty; restricted time availability; student access to resources; students' research skills; ethics supervision; as well as authenticating the student's work.

In common with many distance education systems, Oscail has a small core of academic staff, who act as pedagogical experts, and who rely on an extensive network of part-time adjunct faculty to write course materials, provide tutorial support, and supervise dissertations. Supervisors and tutors are subject experts drawn from academics in the partner institutions, who are paid on an hourly or flat rate basis. Their commitment cannot be open ended, and financial considerations dictate that their involvement with programmes is limited. One approach adopted has been to request supervisors to adopt a indirect-active approach at the earlier stage of the dissertation, moving towards the indirect-passive approach at the end, while extending the support network available to students through the application of group and peer supervision, and online interaction. This approach will be further illustrated below.

Another problem faced by students, not only in distance education, but also in on-campus education is that supervision is not 'on-tap' twenty four hours a day, and access to supervision is normally limited to specific time slots, or by prior appointment only. With online interaction, students can post a query anytime, and will often receive advice and support from fellow students before the supervisor needs to intervene. Similarly

students benefit from the knowledge gained from a more open discussion online of problems and solutions.

Off campus students may have difficulty in obtaining access to appropriate resources to carry out their research in the form of access to software, research instruments, literature and participants. Oscail students are provided with CD-ROMs with SPSS (Statistical Package for the Social Sciences) on a yearly license, and the online library databases provide the vast bulk of the literature required for literature reviews. In addition, students may apply for reading rights at universities throughout Ireland, and may borrow books via the public library system. Students may also exchange and lend books through the Book Exchange forum on Moodle.

It is clear that students must be adequately equipped with the appropriate research and analytical skills to carry out their research. While students should have developed some skills in data collection and analysis in previous modules, often these skills need to be refreshed and oriented towards the more independent approach required for dissertation research. To ensure that students have the required competence to carry out their research, Oscail has designed a refresher course comprising a series of statistical exercises, using SPSS, which students carry out at home, while interacting online in Moodle in tutor led discussions, with peer support. The process of carrying out a research project is also broken into distinct phases with milestones, followed by formative feedback. Students post research outlines on Moodle, review outlines of other students, and prepare research proposals and literature reviews taking into account both peer and supervisor feedback. They prepare a draft report and a PowerPoint presentation on their findings. The final report, the research dissertation, is the student's work and the supervisor provides no further direct support following the return of the draft report.

The ethical dimension of carrying out research has become of increasing concern among the academic community worldwide. At the very least, research should not be seen to do harm to participants; and, generally research should have some benefit either directly to the participants or to the wider community. Arguably, the primary aim of undergraduate research dissertation is to provide a training for the novice researcher, with all other considerations being secondary. Again, with students at a distance the need to ensure that students understand, accept and practise an ethical approach to their research is paramount. One way in which Oscail tackles this obligation is to severely restrict the target groups, so that students are not permitted to carry out research on children or any other vulnerable groups which would require police clearance or lengthy ethical scrutiny. Students complete a detailed Ethics Research Approval

form which lists the aims and justification of the research, how participants are to be recruited and informed of the purpose of the research, how informed consent is to be obtained, and how the results will be disseminated and to whom. They are asked to identify any potential risks to the participants, as well as any potential benefits. They are required to state how participants' anonymity will be protected as well as how will data be stored and disposed of.

One major query faced by distance educators with regard to assessment at a distance is 'how do we know it's their work?' However, plagiarism is an issue which affects not just distance education, and there are a number of electronic methods for detecting plagiarized materials. It is also possible to avoid plagiarism, or to make it more difficult, through appropriate pedagogical design, for example by requiring weekly progress reports posted online; peer supervision and online interactions; breaking the process into iterative stages, and requiring students to complete reflective diaries.

The following section will outline the approach to supervision of the BA psychology dissertation.

6. The Psychology Research Dissertation

Students taking the Oscail BA may specialize in psychology by taking 50% of their credits in this subject. The curriculum of the psychology programme is designed to meet the professional requirements of the Psychological Society of Ireland which regards research methods as a core skill competency in a psychology degree. While research methods and statistical analysis are embedded in every module, the final year research dissertation is an essential element of the degree programme. While approximately 200 students take the foundation module in psychology, on average 30 student per year elect to take the final dissertation module.

Prior to 2006, students taking the dissertation module attended a three-day residential research and statistics school in the Department of Psychology in Queen's University Belfast. They carried out their research under a supervisor whom they could meet at study centers for a limited number of group meetings. They could also telephone or email their supervisor for advice. There were many disadvantages to this model, not least variations in support offered by supervisors, as well as overload on supervisor time where individual students demanded substantial private supervision. While support was offered via Moodle in 2005, the level of student participation was relatively minimal, since interaction was not built into the pedagogical design or assessment structure.

In 2006, the research module was redesigned to incorporate a blend of online supervision by a designated academic, peer supervision and support, and limited face to face supervision in a group and individual context. The study year (comprising 30 weeks) was divided into a series of stages and milestones, involving a series of online tasks and exercises. Table 1 outlines the structure of the academic year.

Week	Activity
Week 2	Orientation session in DCU (face to face); Introduction to SPSS, literature searching, research topic
Week 4-8	Weekly statistics exercises, using SPSS; supported by tutor on Moodle (20% of marks for portfolio)
Week 6	Student posts research outline on Moodle
Week 7	Two peer reviews per research outline posted on Moodle
Week 10	3-day intensive Research & Statistics School in TCD; 1 st meeting with supervisor (attendance mandatory)
Week 11	Research Proposal and Literature Review (20% of marks)
Week 14	Data collection following Ethics Approval from Academic Coordinator & Supervisor; optional group supervisory meeting in DCU
Week 13-29	Online supervisory discussion forums – students and supervisors; trouble shooting, problem solving
Week 26	First draft of report; feedback from supervisor
Week 29	Submit dissertation portfolio (60%)

Table 1: Module Structure Psychology Dissertation Module

The Research and Statistics School is an intensive three-day session comprising 25 hours of class contact. The purpose of the School is to consolidate knowledge and understanding required to complete an undergraduate dissertation and covers practical sessions in bivariate and multivariate statistics using SPSS; coding and input and transformation of data; data analysis and interpretation; report writing; and ethical issues. Students also meet their allocated supervisor for a thirty minute consultation to discuss their research outline and to lay the ground for further development of their research topic into a fully worked out research proposal and literature review.

A further two-hour group supervisory session was organised in DCU. Following approval of the Research Ethics Form, students were permitted to collect data and start their analysis, posting any further questions on

Moodle. The following direction was posted on Moodle with regard to the role of the supervisor:

“Your supervisor will be available to answer questions via Moodle between now and ... when you submit. Unless your query is personal and private, you should not contact your supervisor outside Moodle. You should also try to send a regular progress report via Moodle and interact with your fellow students; sharing resources, ideas etc. Remember that you are carrying out a piece of independent research, so you will need to make some effort to work out answers for yourself before consulting your supervisor. The PSI accreditation panel which visited Osaic recently was very keen to ensure that the final thesis produced by students reflected the work of the student, rather than that of the supervisor.”

In the context of Anderson’s model of supervisory styles, the four supervisors appointed to support the 25 students on the Psychology dissertation module were advised to adopt the indirect/active approach while the student was in the course of finalising the topic and research design, and from then on to adopt the indirect/passive approach, to ensure that the final dissertation represented the student’s independent effort.

Students submitted their final thesis and completed a three-hour examination on statistics and research methods in August 2006. The outcomes of the revised approach to dissertation supervision and student support will be discussed in the next section.

6. Outcomes

Analysis of interactions on Moodle show that students engaged in peer support and supervision, by giving feedback on research topics, answering questions from other students on statistics, suggesting new approaches or references, offering to source participants for surveys or to distribute questionnaires, providing advice on technical issues with SPSS.

A supervisory forum was set up for each supervisory group with a discussion thread for each student. Students could post questions to their supervisors in the discussion threads and either supervisors or other students posted responses. Often, by the time the supervisor had checked in to the Moodle conference (approximately 2-3times per week), other students had responded, or the student had worked out the answer for themselves.

Thirty students registered initially for the dissertation module in January 2006, but five withdrew for a range of personal reasons before the Research and Statistics School. Twenty-five students submitted their dissertation

in the August 2006. Of these, sixteen (64%) responded to an online evaluation questionnaire at the end of the module.

Students overwhelmingly agreed that the dissertation process had expanded their knowledge of psychology (93.8%); 87.5% agreed that they had enjoyed the challenge, although almost two thirds (62.2%) found the dissertation too time consuming. Just 20% would elect to take an examination instead of completing the dissertation.

The majority of students were positive about the supervision they had experienced. Almost two thirds (62.5%) expressed satisfaction with the level of supervision provided, and a similar percentage found that interaction with their fellow students on Moodle helped increase their knowledge and understanding. Some 87.5% agreed that their supervisor had provided timely feedback; and 68.8% agreed that their tutor had provided good guidance and had been approachable and supportive. Almost two thirds (62.5%) agreed that the supervisor had made good use of Moodle. Just over one half (56.3%) felt that the supervisor was knowledgeable about the student’s topic (this is not surprising as students could select a topic which is outside the supervisor’s area of interest). Again it is not surprising that just over half (53.3%) expressed satisfaction with the level of face-to-face supervision. However, the reality of distance education is that, whatever the student preference, extensive face-to-face supervision is not an option.

Some further insights into the supervision process can be gleaned by analyzing the styles adopted by individual supervisors, some of whom adopted a more direct approach. There is some indication that supervisors who accepted individual contact by telephone and email were viewed more positively by their students; however, the downside of such individual attention is reduced interaction on Moodle, thereby reducing the benefits of online supervision to the wider group, as well as imposing excessive demands on the supervisor’s time.

From student comments it is clear that greater clarity is required in managing the expectations of both supervisors and students of the supervision process. According to one student: ‘reflecting on this now I felt unsure of the level of supervision which was available to me. It would benefit new students greatly if they were given guidelines re the level of supervision which is available and approachable. The supervisor did not make contact unless I did.’ Another student resented the more indirect/active supervisory approach: this student felt ‘scolded like a child’ by a supervisor for asking questions on Moodle as ‘at this level one should know the answers’. Would I be asking questions if I knew the answers?’. However another student explained that they were happy

with their supervisor who was 'knowledgeable, interested and very helpful'; some minor problems had arisen which led to some wasted time, but even this was seen by the student as "a learning process so the experience was not an entirely negative one and I learned valuable lessons from it. The supervisor had obviously read my proposals very carefully and was well-informed and I was impressed by that."

The issue of conflicting expectations is a common problem in any educational setting where students, institutions, and instructors may all be working from a different set of expectations. It is important that expectations are clear from the beginning so that they can be managed, as research has demonstrated that those who have realistic expectations are more likely to have their expectations met, and thus to report satisfaction with the service they receive (Stevenson et al, 2006). Some students may expect to have twenty four hour supervision available, with instant response to questions, however no system can provide such a level of support. Nor, it is argued, should such intensive support be available, where the objective of the dissertation is to develop the student's capacity to become an autonomous learner. The University of Western Australia has developed its Student Perceptions of Supervision (SPORS) questionnaire to match student/supervisor expectations, and may offer a useful tool for exposing mismatched expectations and reaching a mutually agreed level of support (Jamieson and Gray 2006).

Finally, one objective measure of the impact of this new method of supervision of undergraduate research would be to examine performance in the dissertation. While the proportion of students obtaining a second class grade one and higher mark in the thesis remained at approximately 70%, performance in the examination was greatly improved with almost 80% achieving second class grade 1 and higher in 2006, compared with 46% in 2005. It is likely that this improvement in grade was effected by the more intense level of peer and tutor support at the earlier stages during the online statistical exercises and later as students were exposed to a broader range of research and statistical issues through the online discussions of questions and problems posted on Moodle.

7. Conclusion

This paper has discussed the particular challenges involved in supervising research dissertations at a distance and has shown that it is possible to use elearning methodologies to provide a supportive environment for students embarking on undergraduate research. The indirect passive approach recommended by Oscail promotes independent and autonomy, but may also

generate less satisfaction among some students. Instructional design is the key to improving support for research, through building in pacing, appropriate tasks, opportunities for peer supervision and peer learning. In the next presentation of the module, the lessons learnt from the evaluation will be put in place, with greater clarity in instructions to students and supervisors about their respective roles. Credit will be given for peer reviews and interaction on discussion forums. The key is to provide an experience which presents challenges as well as rewards. As one student concluded: 'I think there is no easy way to go about it – it was a very steep learning curve, challenging and at times overwhelming, but ultimately rewarding and satisfying to know that one has risen to the challenge.'

References

- Fox, Seamus & MacKeogh, Kay 2003 "Can eLearning Promote Higher-Order Learning Without Tutor Overload?" In *Open Learning* June 2003 Vol 18 pp121-134
- Hemmings, S. (2001) "The place of the dissertation in learning to research" in R. Humphrey, and C. Middleton (Eds.), *Learning to research: resources for learning and teaching in sociology and social policy*. Sheffield: SSP2000/ Teaching and Learning Network for Sociology and Social Policy.
- Jamieson, S., and Gray, C. (2006) "The supervision of undergraduate research students: expectations of student and supervisor" *Practice and Evidence of Scholarship of Teaching and Learning in Higher Education*. 1(1): pp 37-59.
- Lorenzi, Francesca, MacKeogh, Kay, Fox, Seamus (2004) Preparing students for learning in an online world: an evaluation of the Student Passport to eLearning (SPEL) model *European Journal of Open Distance Learning (EURODL)* Jan-June 2004/1 accessible at http://www.eurodl.org/materials/contrib/2004/Lorenzi_MacKeogh_Fox.htm
- Rowley, J., and Flack, F. (2004) "What is the future for undergraduate dissertations?" *Education + Training*. 46(4): 176-181.
- Stefani, L.A.J., Tariq, V., Butcher, T., and Heylings, D. (1997) "A comparison of tutor and student conceptions of undergraduate research project work" *Assessment & Evaluation in Higher Education*. 22(3): 271-289.
- Stevenson, Keith, Mac Keogh, Kay, Sander, Paul (2006) "Working with student expectations of tutor support in distance education: testing an expectations-led quality assurance model." *Open Learning* vol 21, no 2, July 2006, pp 139-152
- Todd, M., Bannister, P., and Clegg, S. (2004) "Independent enquiry and the undergraduate dissertation: perceptions and experiences of final year social science students" *Assessment & Evaluation in Higher Education*. 29(3): 335-355.

University of Western Australia SPORS – Student Perceptions
of Research Supervision. Accessed 27 November
2006. <http://www.catl.uwa.edu.au/etu/spors>