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# Linking Research and Teaching: An Applied Soft Systems Methodology Case Study

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## ABSTRACT

This paper links research and teaching through an applied Soft Systems Methodology case study. The case study focuses on the redevelopment of a Research and Professional Skills module to provide support for international postgraduate students through the use of formative feedback with the aim of increasing academic research skills and confidence. The stages of the Soft Systems Methodology were used as a structure for the redevelopment of module content and assessment. It proved to be a valuable tool for identifying complex issues, a basis for discussion and debate from which an enhanced understanding was gained and a successful solution implemented together with a case study that could be utilised for teaching Soft Systems Methodology concepts. Changes to the module were very successful and resulted in significantly higher grades and a higher pass rate.

## KEYWORDS

Formative Feedback, Information Systems, Information Technology, International Students, Postgraduate, Research Skills, Scaffolding, Soft Systems Methodology, Systems Thinking

## INTRODUCTION

Soft Systems Methodology (SSM), developed by Peter Checkland (1981) to provide a method for dealing with complex real-world problems in organisational, management and policy contexts, takes the premise that organisations are open systems that interact with their environment. Furthermore it recognises that problem situations are unstructured or soft in nature and involve people that have differing viewpoints about the problem's origins and nature, ways to address it and goals to be achieved. In essence it provides a way of thinking of and reflecting on the problem situation. Through use of the approach clarification and an enhanced understanding of the problem situation can be achieved throughout the development process. The methodology involves a number of activities: finding out about a problem situation; formulating relevant purposeful activity models; using the models to debate the situation; ascertaining desirable and feasible changes that would improve the situation;

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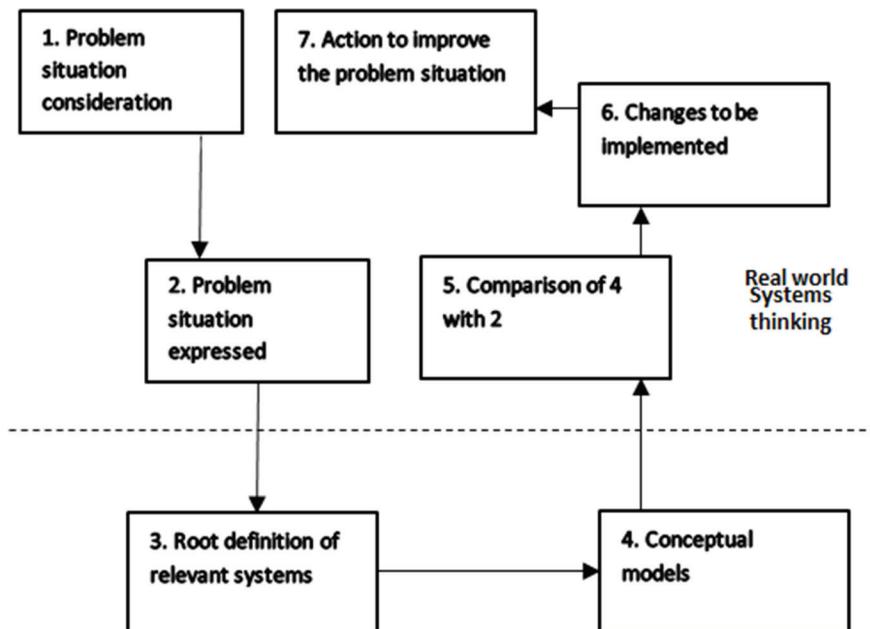
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accommodating conflicting interests; and taking action to bring about improvement (Checkland, 1999). In other words, it enables a better understanding of the problem and ideas for improvement through a comparison of the world as it is and the world as it might be. In contrast, hard approaches formulate a best possible solution to address the circumstances of the problem situation. A hard systems approach would be difficult to implement within an ill-defined problem situation where stakeholders are unsure of the finer details of the current working system (Checkland and Poulter, 2007).

SSM has successfully been applied to various contexts (e.g. Biggam, 2002; Warwick, 2008) over a number of years. This research is essentially an action research case study aimed at improving educational delivery on an Information Systems (IS) and Information Technology (IT) postgraduate module which covers research methods and aims to prepare students for writing their masters level dissertation and for working as an IS /IT professional by encouraging the development of holistic skills including data collection, critical analysis, reflective thinking and presenting structured arguments. Such skills are essential for professionals working within IS /IT if they are to contribute actively to the development of the profession and their own career. SSM is taught on IS /IT degrees and extensively used within the profession for solving complex issues that are difficult to define. Improving student performance presented the staff with a complex issue that involved a diverse range of stakeholders all with very different expectations. The University wanted a module that achieved its learning outcomes; staff wanted to deliver learning material that students would enjoy and understand, while students failed to appreciate how the skills the module taught fitted into IS work so they were reluctant to attend or participate. SSM therefore presented the ideal tool not only to help the staff identify and progress problem solving, but also to involve the students in research that used a valid IS method to solve a 'soft' work related issue and show the role of SSM applied in a real life situation.

The original seven stages of SSM, not SSM Mode 2 (Checkland & Scholes, 1990) (based on the activities above and shown in Figure 1), are used as a structure for the research which is essentially a descriptive case study that collected information from one institution, a post 1992 University with an unrivalled widening participation policy (Layer, 2012, p.3).

Figure 1. Soft Systems Methodology stages (Adapted from Checkland, 1999)



The use of SSM as outlined in this paper not only provided a structure for the redevelopment of a module but also a case study for the teaching of SSM concepts that the students understood. As the style of analysis in SSM is open-ended and the modelling language highly flexible, students can find lectures difficult to follow and too abstract. Furthermore “students without work experience may not always see the value. They struggle to interpret a description of a realistic situation and their list of issues can be naïve” (Hindle, 2011, p.32). However, actively engaging students by utilising a case study related to a context that they are familiar with can enable effective learning (Kolb, 1984). The link between research and teaching not only benefits student learning but can also improve knowledge development and learning within universities (Jenkins and Zetter, 2003).

Although many students currently enter postgraduate studies with some basic research skills such as the ability to construct essays or carry out research from books, they lack the level of academic thinking or critical writing skills required for postgraduate scholarly writing (Harris 2006, p.136). Postgraduate study requires very different research and writing skills when compared to undergraduate studies (Buck & Hatter, 2005). According to Brew (2006) staff expect that postgraduate students will “already have had considerable experience in investigation, in project research, and in inquiry based learning” (p.44). This can result in a gap between the expectation of staff and the actual performance of the students, which has been linked by Froese, Gantz and Henry (1998, p. 103) to poor instructional delivery. Schroeder (2004, p.1) also believes that students are now unable to cope with abstract ideas and are less independent in thought and judgement. Furthermore Leese (2010) identified that students can struggle to understand the need to be an independent learner.

International in this context refers to students that have travelled to a different country from the one they are resident in to undertake tertiary education so their prior educational experience has been under a different educational system, in a different cultural context and possibly in a different language (Bamford, 2008, p.1). International students have a set of skills and experiences which have equipped them for past successes but they may not be fully useful in their new setting (Ryan and Carroll, 2007a). They can find it difficult to adjust to the level of academic rigour required of them or to cope with subject specific language and also have to cope with adapting to different cultural norms, language difficulties; different teaching and delivery styles and different performance measures (Ryan and Carroll, 2007a, p. 6). Indeed “they face different social and cultural mores and customs, norms and values from the ones they have known, different modes of teaching and learning; and different expectations and conventions about participation and performance” (Ryan and Carroll, 2007a, p. 3). “Institutions which do not address the unique needs of international students may leave these students feeling disappointed, unfulfilled, and even exploited” (Sherry et al., 2010, p.33-34).

## **CASE STUDY**

### **Context**

Past experience has shown that many international postgraduate students have had little research experience during their undergraduate studies and need support to enable them to develop appropriate research skills. Revalidation of postgraduate awards and a move from fifteen to twenty credit modules provided an opportunity to rethink and restructure modules. The restructuring of the IS Masters Degree Research and Professional Skills module focused on providing support for students through the use of formative feedback, with the aim of increasing their academic research skills and confidence. The stages of the Soft Systems Methodology were used as a structure to help focus the development of the module.

Action research is open ended and does not have a fixed hypothesis. Therefore it is a form of self-evaluation aimed at improving performance and is often used to investigate educational issues because it combines diagnosis with action and reflection (Stringer, 2014). It is also participatory in nature, requiring researcher and client collaboration, and follows a number of steps. Firstly the problem must be diagnosed and defined; then alternative options considered and finally changes implemented

(Bryman, 2012; Pring, 2015). SSM has for some time been an accepted action research methodology used for a wide range of social science research that require the identification of problems and the implementation of solutions. It is considered a flexible method that generates debate, learning and understanding; enables key changes; facilitates negotiating the actions to be taken and makes possible the meaningful collaboration among concerned stakeholders (Mehregan and Hosseinzadeh, 2012).

### **Stage 1: Problem Situation Consideration**

Over the last two decades the UK government has pursued a widening participation policy that has opened up entrance to Higher Education (HE). The majority of young people now expect to attend University and obtain a degree and widening access ensures that all students from under-represented groups can successfully participate in higher education (OFFA/HEFCE, 2014). Almost four decades ago access for the masses to HE was only a socialist goal. Traditional elite HE had shaped the minds of the ruling class, but mass HE, in theory, would prepare people for a broader range of technical and economic elite roles (Trow, 2007). The reality of mass HE teaching however, has been condemned for dumbing down content and not producing quality graduates (Haggis, 2006, p. 2). Despite this criticism, mass HE is now moving toward universal HE, whose primary aim is seen as adapting the population to rapid social and technological change (Trow, 2007).

The University underwent an extensive reorganisation and revalidation of its postgraduate curriculum. This resulted in modules being changed from fifteen to twenty credits and this provided the opportunity to make changes to modules. Consideration of the problem situation provided the basis for discussion and debate amongst academic staff which led to an enhanced understanding and a shared viewpoint that could be used as a basis for overcoming the problem situation. The Research and Professional Skills module this paper relates to aims to develop students' academic and research skills by introducing them to academic writing, academic research sources, research methods, research ethics and referencing. This prepares students for successive research modules and their dissertation within the information systems discipline. Assessment for the module prior to revalidation focused on students critically analysing journal articles and preparing a mock dissertation proposal. However students struggled with the concepts the module covered. This ranged from writing a mock proposal to finding suitable academic literature. Pass marks were low and resits common. A follow-on module in semester two, where students prepared their actual research proposal and started their literature review, had similar problems. The students clearly struggled to grasp the basic concepts of conducting academic research and were unable to prepare research questions that allowed them to collect and analyse data which they were required to do for postgraduate study. Requests for extensions were a regular occurrence, as many students kept putting off starting their assessment work, possibly because they did not know where to begin.

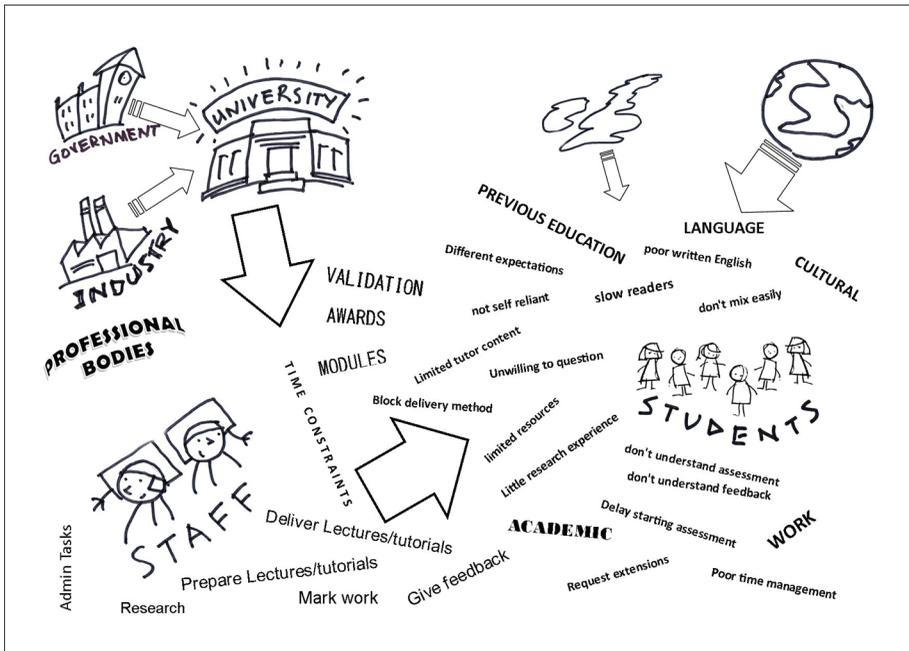
The module was delivered in 'block' mode over three full days, which restricted feedback opportunities, although students were also given another two-hour tutorial session with module staff before they submitted their assessment.

### **Stage 2: Problem Situation Expressed**

The rich picture in Figure 2 puts the Research and Professional Skills module in context by showing an overview of the educational environment. It highlights structure, elements of the process and situation climate (Checkland, 1999). This diagrammatic method helped staff to identify various issues that affected the success or failure of the module, such as poor level of spoken or written English, inability to understand the assessment and an unwillingness to ask questions, limited range of sources, and different expectations of educational requirements.

The educational environment (shown in Figure 2) is commonplace in UK universities. Educational policy is driven by government and industry. Universities react to various pressures put on them by

Figure 2. Educational environment



issues such as changes to funding or the demand for different topics to be taught by revalidating their awards. Revalidation events present staff with the opportunity to make major changes to individual modules.

Within the current UK HE environment international students now make up a large percentage of postgraduate students. In the 2012 to 2013 academic year they accounted for 59% of all postgraduate students studying full time, taught courses (HESA, 2015). International students face different problems to home students, they have different expectations of masters' level study and joined the module with little research experience. Their previous study environments tended to lack resources and students were not encouraged to be independent learners. Students' language skills needed improving which affected their understanding of the assessment and feedback. Students manage their time poorly and delay starting their assessment which resulted in requests for extensions and poor grades. Students tended not to mix with those from different cultural backgrounds, nor were they willing to question the module content or assessment. The majority of the students also worked part time and therefore had less time to focus on study.

### Stage 3: Root Definition of Relevant Systems

Root definition: Teach research skills to postgraduate students using suitable teaching and assessment that improves the understanding and skills of international students and results in them achieving better grades.

CATWOE is used below to define various aspects of the system. More specifically what the organisation is trying to achieve together with the problem areas and how the solution will affect the organisation and people involved.

#### Customer/Client

Postgraduate international students.

### Actor

The two members of staff that designed the assessment and module materials; delivered the module content and assessed assignments submitted.

### Transformation Process

Achieve improvement in the module success rate by providing students with additional support and feedback delivered in a variety of different forms to ensure that all learning styles are catered for. To assist students in developing the research skills they need to successfully complete their programme of study.

### World View

Ensuring worldwide social inclusion and successful participation in Higher Education by furthering student achievement and employability prospects.

### Owner

University Management

### Environment

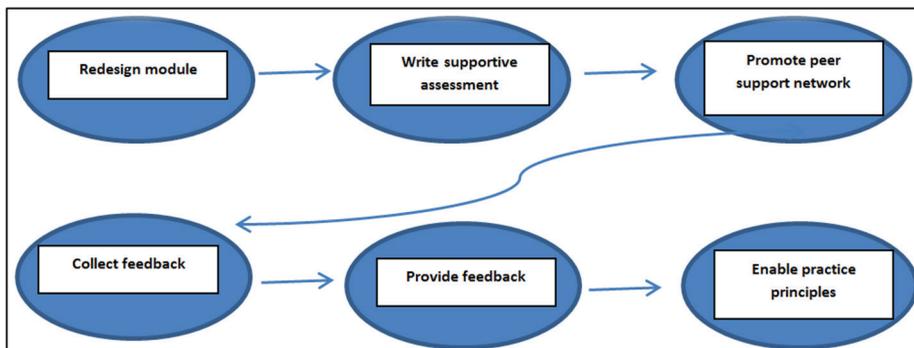
Changing educational environment; Professional body requirements; University award structure, new module structure; delivery pattern over two consecutive days, with one three-hour and one two-hour session each week for nine weeks.

## Stage 4: Developing a Conceptual Model of the Change System

Figure 3 shows a conceptual model of the change system being proposed. The redesign of the Research and Professional Skills module is centred on the writing of the assessment and module content, so that it provides support for students in the form of establishing a peer support network or community of practice, building in multiple feedback opportunities so students feedback to students, students feedback to staff and staff feedback to students and the practicing of taught principles.

The CATWOE analysis (stage 3) helped module staff identify all stakeholders and issues that impacted on the module and provided a starting point for re-design. The brain storming session held to complete CATWOE (stage 3) and the subsequent conceptual model (stage 4) also provided the module leader with information that was used at various University committee meetings to support a new delivery approach and increasing the number of tutor hours previously allocated to the module.

Figure 3. Conceptual model of the change system



The transformation process identified also proved essential when it came to developing the conceptual model that was adopted to implement module changes.

### **Stage 5: Comparing the Model with the Real-World Situation**

Postgraduate students have been shown to learn best when they are supported, engaged, challenged, have good models to work with and opportunities to practice and receive feedback (Piercy, Sprenkle and McDaniel, 1996, p. 164) or undertake structured exercises (Johnson, 2008, p. 277). Barrakett (2005) found that student-centred techniques had a positive effect on student performance, learning experience and subject evaluation. Moreover Harris (2010) suggests that more diverse, and in many instances more complex students with a varied range of needs, require a learner-centred approach to learning. This applies to teaching and the variety of support and administrative systems which underpin delivery.

Formative feedback can assist with knowledge and skills development (Azevedo and Bernard, 1995; Epstein et al., 2002) and motivate learning (William, 2010). Hounsell (2007) emphasised the point that well-crafted feedback in higher education can enhance learning in the following three ways: by accelerating learning, by optimising the quality of what is learned and by raising individual and collective attainment. Formative feedback should have a range of qualities including being: timely, motivational, individual/personal, contain enough detail and be directly related to assessment criteria/ learning outcomes (Shute, 2008).

Effective formative feedback not only gives useful information to students, but also to teachers, who can use the feedback to make informed judgements about the students' level of understanding and if necessary to change their teaching (Gibbs & Simpson, 2004; Nicol and Macfarlane-Dick, 2006). Lea and Street's (1998) Academic Literacies Approach looks at the 'cultural and contextual' reading and writing practices of students (1998, p. 157) and Sutton and Gill (2010, p. 11) have built on this research to develop what they call 'feedback literacy'. This is part of the broader process of acquiring academic literacy, of learning to think, read and write in new ways. However, it is stressed that there is not one universal formula for producing effective feedback.

According to Davies (2011, p. 2) descriptive feedback is considered one of the most effective forms of feedback because it enables the students to see which aspect of the assessment criteria they have fulfilled and which they have not. Descriptive feedback that supports learning has the following attributes,

- Comes during, as well as after, the learning
- Is easily understandable and related directly to the learning
- Is specific so performance can improve
- Involves choice on the part of the learner as to what and how to receive feedback
- Is part of an ongoing conversation about learning
- Is in comparison to models, exemplars or descriptions

However, feedback that is negatively critical or controlling can prevent performance (Fedor, Davis, Maslyn, & Mathieson, 2001). Bloxham and Boyd (2007) note that formative feedback must relate to future performance (feed forward). In other words, guidance should focus on what a student should pay attention to in future assessment tasks. In relation to this Boud (2007) notes that unless students are able to use the feedback given to produce improved work, neither they nor those giving the feedback will know that it has been effective.

Formative feedback provides students with a form of scaffolding. Scaffolding is an educational term used to describe supportive elements added to a program in order to help students develop a higher level of understanding (Larkin, 2002). Students' various learning styles and learning experiences can be supported (Kirk et al, 2014; Salend, 2010) by "actively diagnosing student needs

and understandings, providing tailored assistance and specific feedback, and controlling for frustration and risk” (Larkin, 2002, p. 30).

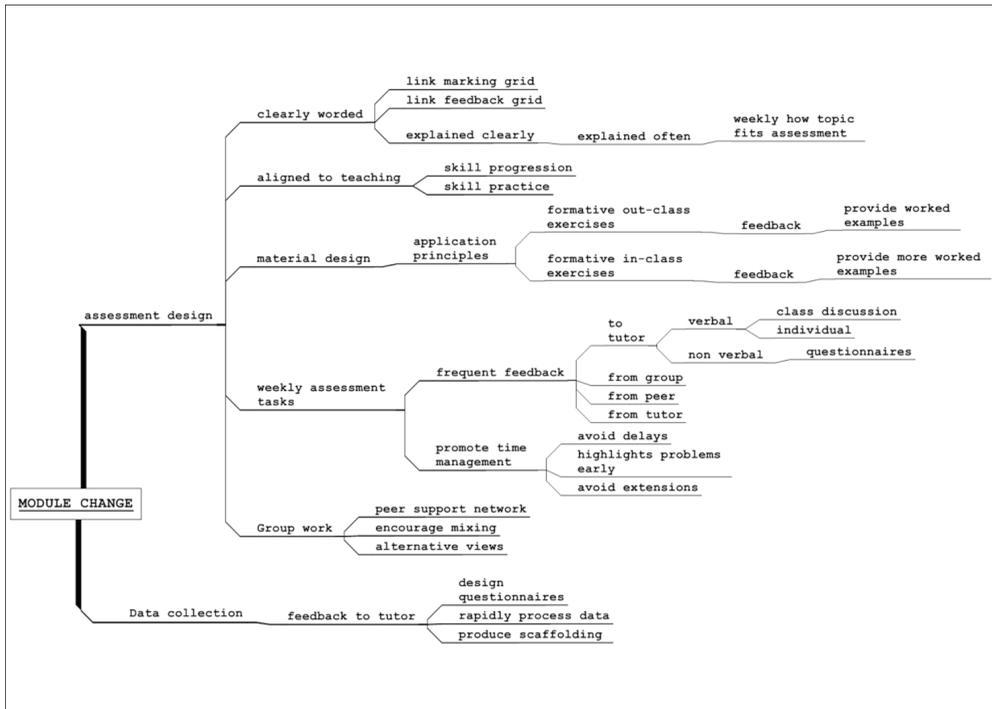
Scaffolding parallels Vygotsky’s Zone of Proximal Development (1978), which is the distance between a student’s ability to perform a task without help (e.g. solving a problem independently) and with help (e.g. under the guidance of a tutor and/or through peer collaboration). Successful teaching depends on identifying the area that is just beyond the students’ current abilities, which can be difficult when a diverse group of students is involved. Freire (1984) argued that any pedagogy should have demonstrable relevance to the immediate worlds of the students and must enable them to analyse, theorise and intellectually engage with those worlds. In order to learn in a deep way (i.e. to fully understand concepts) it is widely acknowledged that students need to be cognitively engaged through thinking, reasoning, analysing and/or problem solving. This contrasts to surface learning which tends to be more passive in nature and involves students memorising knowledge and regurgitating it at exam time. Scaffolding provides “multiple co-occurring and interacting supports for the same need” (Tabak, 2004, p. 307) and builds on constructivist theories of learning which emphasise the active role learners take in constructing and organising their own individual knowledge schemas (Duffy and Jonassen, 2013, p. 64). The challenge is how to assist students to make links between new knowledge and what is in their existing schemas (Ryan and Carroll, 2007b, p. 14).

The original way that the module was delivered in block mode provided no real opportunity for staff to identify problems as they developed or to provide scaffolding to overcome the issues effectively. After the initial three-day delivery the students were only seen once more in order to check their progress with the assessment. By the time this meeting was held, even when problems were identified it was not possible to implement a solution. Feedback was therefore seen as an essential element that needed to be developed within the new module and the students as being the key to effective feedback. With this in mind the students were introduced to the module and the research project at the initial module meeting. They were told that their input was vital and they were encouraged to take an active part in the research. In order to identify problems with the module staff meetings were initially held, followed by several in class discussions with the students at key points within the module. For instance, the first student discussion took place after the assessment was handed out. Initially the students seemed reluctant to discuss the assessment and claimed that they understood what was required of them. It was only after they were split into groups and asked to talk together for a while that their reluctance to say they did not understand was overcome and it was only at this stage that the really soft nature of the problem the staff faced became apparent.

## **Stage 6: Defining the Changes to be Implemented**

The changes to be implemented to the module are shown in the form of a mindmap (Figure 4). The two main sections (assessment design and data collection) provide the framework for module change and support research skills development. The sections and sub-sections work together to support students through the various stages of the assessment by constantly monitoring their progress and providing targeted support, when needed, to help students identify what they are expected to do and how they should go about doing it. The student’s progress on the module was monitored in a variety of ways. Discussions were held in class and students were encouraged to discuss anything that they did not understand. The class was held on a Monday and each Friday students submitted their work in progress for feedback at the next class. This helped ensure that some work was completed on the module each week, monitored time management and understanding of the topics that had been covered. The written submissions by the students helped staff to pinpoint areas that needed to be revisited in the following class session or areas where more scaffolding was required such as preparing specific examples to deal with issues that had clearly not been understood. Although this proved to be time consuming for staff many of the issues that the students really struggled with could not have been identified in advance and had to be dealt with as they arose. Group work which had not been greeted by the students with much enthusiasm also turned out to be an excellent support tool which provided

Figure 4. Mindmap for supporting research skills development



clarification and alternate views for them on a variety of issues. It also built confidence as students realised that they were not the only person struggling to understand a specific issue.

### Stage 7: Action Taken to Improve the Problem Situation

The first run of the revalidated module in 2011 had twenty-five students. Only three of the students were female, although this is not unusual as research has shown that females make up only 13% of the students accepted on IT degrees (e-skills, 2014). Four of the students were UK citizens, the rest came from Nigeria, Sri Lanka, Cyprus, China, India and Thailand.

### Module Structure and Content

The mock research proposal, previously an individual piece of work, was changed to a group presentation which the students worked on for the first five weeks of the module. Working in a group provided the students with an opportunity to see the way other people approached the task, to share ideas and make new friends. Also, as the module was one of the first they were undertaking at the University, it provided them with a support network while they settled into their studies and helped to develop the professional skills of team working and delivering a presentation.

The critical review remained an individual piece of work, but the number of articles that the students had to use for the review was reduced and the same articles were used in the mock research proposal. Utilising the same articles for both pieces of work reduced the amount of reading that the students were required to do and allowed them more time to become familiar with how to read academic journal articles. An individual piece of reflective writing was added to the assessment in order to encourage the students to try and connect what they had learnt on the research skills module with their other modules.

## Assessment Design

The assessment design was clearly worded so that it linked with both the marking and feedback grids. The entire assessment was clearly explained to the students in their first lecture and again in subsequent lectures when a new topic was introduced the staff explained how it fitted into the assessment and the marking and feedback grids. The design of the assessment was closely aligned to the teaching schedule so that assessment related skills were taught in class, practiced in-class then implemented out of class to a specific part of the assessment which the students then received feedback on.

The weekly assessment tasks were designed so that students and tutors received frequent feedback. For example, students were given weekly tasks that the group needed to accomplish, these fitted together to form their mock research proposal. Week one covered how to write a research question; week two, how to reference, prepare an annotated bibliography and write a literature review; week three, research ethics and methodology; week four, data collection and questionnaire design. Also in week one the students were provided with a list of topic areas they could choose for their research proposal. They were then put into teams to work on selecting a topic and developing suitable questions.

Assessment related feedback was given via the following mechanisms: from the students to the tutor, from the students themselves to their group members and their peers and from the tutors to the students, both verbally and in writing. Tutor feedback comprised of not only individual feedback and class discussions but also questionnaires that enabled students to feedback on areas that they did not want to discuss with the tutor. An example of individual feedback given to students during the feedback sessions is as follows: for the reflective writing students were encouraged by the lecturer to be less descriptive and more evaluative in their feedback, always asking themselves why and how they could improve in the future. In relation to group feedback, students were given help from staff in developing possible research questions and feedback was given on the appropriateness of the questions they developed. Each group also presented their research ideas to the class in order to receive peer feedback.

The promotion of time management was addressed by the allocation of weekly assessment tasks. This encouraged the students to start work on their assessment early so that they could receive feedback, address any potential problems at an early stage and avoid the need for extensions.

The inclusion of a group work assessment encouraged students from different cultural backgrounds to mix and exchange alternative views. It also provided the students with a supportive peer network and enabled them to get to know more students on their cohort and to therefore feel more integrated into a community of practice (Wenger-Trayner and Wenger-Trayner, 2015). The groupwork exercise was used for the part of the assessment that in the past the students had found the most difficult, producing a mock dissertation proposal. This reduced the amount of stress the students experienced when undertaking this exercise and enabled the students with little research experience to contribute ideas to the group and to benefit from other group members' ideas and experience.

A variety of in and out of class exercises provided the students with practice in applying principles covered during the lecture. If any principles had not been completely understood further scaffolding was provided. Various templates were provided for students. For example, it became apparent from a feedback tutorial that students were unsure how to construct the critical review. Therefore, a suggested framework for the critical review was provided together with a grid that showed them how they could analyse the reference lists of the three journal articles and a very brief sample critical review.

Students were provided with supported research sessions. For example, they were taken to the library where they had a session with the subject specific librarian, who introduced them to suitable academic databases. This was followed by a supported search session to enable the students to find suitable academic material for their assessment.

## Provision of Student Feedback in this Transformation

The students completed weekly questionnaires to feedback to staff on any problems they may have with the assessment or topics being taught. This helped staff identify any areas that may not have

been understood. Identifying issues that students were struggling with at an early stage and providing additional support structures assisted successful completion of the assessment. However, tutors had to design and review questionnaires between weekly teaching sessions. It was important to react quickly to put in place any extra support that was required and this was time consuming.

The first opportunity for the students to feedback to the staff took the form of a questionnaire given to students at the beginning of the module that asked about previous research sources the students had used. All the students said that they had used books, but only 56% had used journals and 44% had used only newspapers and materials found from websites to supplement information from books. Rather surprisingly given the research sources they identified 43% of the students claimed they had previously received tuition on how to identify academic and non-academic sources. Half of the students claimed to have used Harvard referencing before, although only 17% of students said they were confident users, while 34% said they were not confident at all. Only 21% of the students were confident that they could write a bibliography and a reference list. Consequently, the module integrated tuition and exercises on Harvard referencing, how to search for and critically review academic journal articles.

A questionnaire on team working was filled in by the students after they had completed the first part of the assessment in order to try and ascertain if the students had benefitted from group and peer feedback and if they had found working in a group beneficial. It asked the following questions:

1. Did working as a team help you to generate ideas for the assessment?
2. Did working in a team help you to understand how to prepare research questions better?
3. Did you get to know any new people as a result of working in a team?
4. Did working in a team give you more confidence?
5. Did you find it useful to do Assessment 1 as part of a team? Please explain.
6. Did your team encounter any problems? If so were they a result of a lack of communication or a specific team member?
7. Do you think this assessment would have been better if it was NOT team work but individual?

Twenty-three students completed the questionnaire. The answers to all of the questions were quite uniform, with 82% of the students answering questions 1, 2, 3, 4, 5 and 7 with Yes. Clearly the majority of the students preferred working in a group. Only two students would have preferred the assessment not to have been team work, although strangely they both thought that working in a team had helped them make friends, given them more confidence and had helped them to understand what made good research questions.

Despite the questionnaire only asking the seven questions and expecting yes/no answers, several students added comments to the bottom of their form such as the ones shown below. All comments were positive.

- *'The criticism I received from team members was constructive. They also offered different perspectives when going over the research question and made working on the assessment quicker by sharing tasks and taking turns in the final proof reading'.*
- *'Working in a group provided more ideas. We changed our questions many times so working in a team helped us to find the right questions in the end ... assessment 1 provided me to understand lots of issues about the module. It was very useful for future work as part of a team'.*
- *'The research seemed difficult at the initial level, but by sharing the areas and combining our different knowledge base it could be seen that we learnt more ... we made friends and learnt a little bit about our cultural backgrounds ... it built confidence and showed different ways or techniques being used by colleagues in developing ideology behind research question'.*

## Summary of Results

According to Harris (2006, p. 138) postgraduate students often read the assessment, ask questions in class but still fail to understand the work they have been set to do, which seemed to be the case. Additional feedback opportunities made all the difference to the students and provided them with the confidence they needed to move forward with the assessment task. The frequent feedback opportunities also made them feel that it was acceptable to ask questions and to say that they had not understood something in class.

The students responded well to the new teaching structure. They worked hard on the in-class tutorial exercises and were willing to contribute to group discussions and to become involved in discussing issues relating to the module. In some cases, the students recognised that their previous studies had not prepared them for the study environment they were now experiencing. For some international students the critical review and reflective essay were the first pieces of work they had produced entirely on their own. Previous assignments were produced by altering a few words from the work of past students and sources they were provided with, which was accepted practice in their previous educational systems.

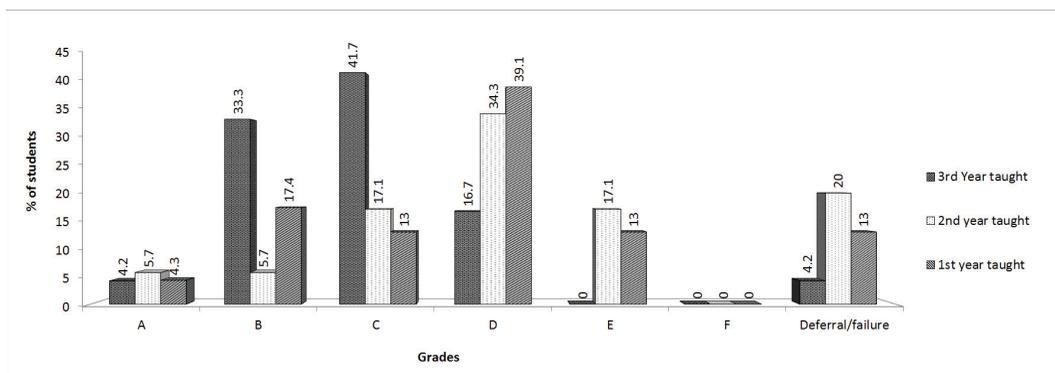
For module staff, providing the level of support these students received required considerable time commitment, which was made possible due to the small size of the class. Because the module staff spend so much time looking at the students work they were able to see more clearly areas that the students found hard to understand, which was essential for providing adequate and appropriate scaffolding. The longer delivery period also enabled the students to form a better relationship with the lecturers on the module. This facilitated the feedback on ‘muddy points’ which was essential to identifying issues the students were struggling with.

When the grades for the module over the past three years are compared (Figure 5) the restructuring of the module, has clearly resulted in improved grades for the majority of the students (shown as 3<sup>rd</sup> year taught in Figure 5). More achieved C and B grades and there was a dramatic fall in the number of D, E and deferral/failure grades. It will be interesting to monitor this group of students to see if higher grades are also achieved when they complete their dissertation module.

All the students agreed that they had found the feedback they had been given for this assessment very useful. Their comments included:

- *‘Feedback enabled improvement’.*
- *‘It has given me knowledge about avoiding plagiarism and how to adequately reference any material used as applied information to my research’.*

Figure 5. Module grades showing improvements over three years



- *‘Before taking this module I knew just a little about critical academic writing or critical review but now that I pass through the module I know much more and can confidently handle or write a good critical review’.*
- *‘I have learned a lot from doing research on journals or academic materials to critically evaluate them. I feel confident now when researching for academic materials that I can identify them. Thanks’.*
- *‘It was a great learning experience. Thank you!!!’*

It would appear that providing feedback on a regular basis was appreciated and that the students were motivated to make changes to their work.

## CONCLUSION

The Soft Systems Methodology provided a structure on which to base the redevelopment of the Research and Professional Skills module. Development of the module focused on the assessment and module content so that it included support for students in the form of formative feedback, peer support and practicing taught principles. Formative feedback enabled both students and tutors to be informed of progress and ways forward in study and tuition respectively.

The SSM approach enabled the structuring and modelling of the problem situation which was considered to be complex due to the non-typical student group. In particular construction of the pictorial representation of the problem situation provided a basis for discussion and debate amongst academic staff. This led to enhanced understanding and a shared viewpoint that could be used as a basis for overcoming the difficulties in delivering the research methods module. If the problem situation is not fully investigated and understood, systems could be developed that lead to reduced efficiency and effectiveness and low satisfaction levels. SSM has been previously applied to a number of everyday life complex situations as a way of improving problematic situations and its application to the redevelopment of the Research and Professional Skills module proved to be very successful. Results from the module were very positive, shown by student feedback comments and improvements in grades compared to previous years. Overall the systemic approach helped the stakeholders to define the emerging ideas for improvement for the delivery of the module.

At the end of the research one of the questions we asked ourselves was could we have implemented the same changes using a different methodology or with no methodology. In our opinion SSM was a crucial planning tool that helped us to gain an essential overview of the module by considering all stakeholders. The research skills module has over the course of time undergone several changes in delivery style and content. None of the changes have resulted in improved student grades or improved student interaction, we achieved both. The visualisation of issues helped tremendously and the actual process of working through a methodology forced us to focus on the task and identifying the issues incentivised us to find solutions.

This research started out with assumptions which were tested and validated as the module progressed. This meant that the transformation process could not be completely planned in advance. Staff had to adopt a flexible, action learning approach and prepared to respond quickly to any needs that were identified with appropriate scaffolding.

The case study outlined in this research could also be used as a way of teaching IS/ IT students the SSM approach. This would assist in providing a familiar context for students rather than abstract ideas that they are unable to relate to. Hindle (2011, p.33) notes that “students with work experience have little difficulty seeing the value of a mapping tool that covers a full range of organisational issues and enables a holistic view of a situation”. However students do not always have such experiences to draw on and can find a context that they are able to relate to, such as that outlined in this paper, more valuable, engaging and shows a way that the technique can be relevant in the real world. This will also help students to link their academic studies to real life work and help them to appreciate the value of research in their professional careers.

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