Teaching research methods in a distance education context: Concerns and challenges

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Abstract

This article discusses an investigation conducted to identify challenges associated with teaching research methods in a distance education context. Constructivist learning was used as conceptual framework, in particular socio-constructivist theories, activity theory and Rich environments for active learning (REALs). Two research modules in a master's programme in education formed the basis of the investigation. One module required students to complete a portfolio, while the other involved assignments and an examination. Two cycles of action research were completed over three years. Data were collected by means of questionnaires and an analysis of study packages and other documents. The study revealed a need for improved cooperative support, the introduction of blended learning and the provision of anchored instruction by making more resources available in both modules. In addition, it was shown that the research methodology module would be improved through the provision of authentic learning contexts, opportunities for team research and more authentic assessment practices.

INTRODUCTION AND BACKGROUND

The study reported on in this article was motivated by concerns relating to the quality of the research projects and research reports (dissertations) submitted by students enrolled for a master's programme in education in a distance education (DE) environment. The students were required to complete two compulsory research modules forming part of a five-module coursework programme, followed by a dissertation of limited scope. The dissertation and the coursework each contributed 50 per cent of the final mark. The fact that many of the students showed no evidence of having acquired the necessary research skills on progressing to the dissertation of limited scope, a fact confirmed by their supervisors, indicated that they had not achieved the outcomes formulated for the two modules. Successful completion of dissertations influences university subsidy.

In addition to the above, an analysis of the examination results achieved in all 12 the modules of the master's programme during the previous year indicated that, with one exception, average scores were lower in the two research modules than in the other modules. Poor performance in methodology courses leads to anxiety, and this may cement negative attitudes towards the field of methodology (Schober,

Wagner, Reimann, Atria and Spiel 2006, 74). Methodology courses have therefore been identified as 'problem courses' at several universities and were often a source of 'student annoyance'.

Teaching research methods in a DE context poses numerous challenges, as will be further explored in the literature review that follows. Thus, the aim of this article is to identify ways in which the acquisition of research skills by postgraduate students can be improved. In particular, the aim is to increase the competency level of students through sound pedagogy, which may ultimately lead to an improvement in the quality of the dissertations submitted. This would also improve the ability of students enrolled for this particular programme (all of whom are practising teachers) to investigate problems in their own contexts. The remainder of this article is therefore devoted to an explanation of the conceptual framework of the study (constructivist learning), a review of the literature on teaching methods in a DE context, and the description of an empirical investigation to evaluate the study packages for the research modules and identify concerns and challenges relating to teaching research methods in this context.

CONSTRUCTIVIST LEARNING

From a constructivist perspective, learning is an active process of constructing meaning and transforming understandings in interaction with the environment (Grabinger and Dunlap 1995, 9). Constructivist learning theories are used as theoretical framework for this study, in particular socio-constructivist theories, activity theory and Rich environments for active learning (REALs).

Socio-constructivist theories are variants of constructivist learning theory (Edu tech Wiki 2009, 1–2). Socio-constructivism emphasises the impact of collaboration and negotiation on thinking and learning. Learners learn from experts, teachers and one another. Assisted learning supports a student by scaffolding learning. In this way the learner can reach performances beyond the level the individual could perform alone. Learning may also be supported by physical artefacts.

Teaching strategies using social constructivism as a referent can be particularly challenging in a DE context but are important to diminish the distance between lecturers and students in DE. Strategies include negotiating meanings with students, class discussion, small-group collaboration, teaching in contexts that are personally meaningfully to students, and valuing meaningful activity over correct answers. Regarding the teaching of research methods, empirical evidence has confirmed that using social constructivist principles in teaching deepens students' understanding of research and the research process (Fox 2007, 269). Other authors (such as Hudson, Owen and Van Veen 2006, 577) have also implemented a socio-constructivist approach successfully in the teaching of research methodology courses.

As a framework for designing constructivist learning environments, activity theory postulates that conscious learning emerges from activity (performance), not as a precursor to it (Jonassen and Rohrer-Murphy 1999, 61). Although learners can

memorise facts and concepts, they understand what the process means only in the context of *doing*. Activity and consciousness are mutually supportive. Learning affects our actions, which influence our learning, which again affects our actions, and so on.

In terms of activity theory, a constructivist learning environment consists of several interdependent components (Jonassen and Rohrer-Murphy 1999, 70–71):

• a problem-project space – it must present learners with an interesting, relevant, and engaging poorly structured problem to solve or project to conduct;

• related cases – it must provide access to related experiences, because the more experiences of relevant activity you have, the more you learn; case reviews should be indexed to the problem so that learners scaffold access to relevant information;

• information resources – it must provide learners with information banks (such as text documents, video, audio) to support problem resolution;

• cognitive tools – it must build in cognitive tools that help learners perform tasks (such as visualisation tools to look at phenomena in different ways, conversational tools, information interpretation, semantic tools);

• conversation and collaboration tools – it must provide learners with learning communities, since learning occurs most naturally by teams of people working together to solve problems.

Engestrom (in Jonassen and Rohrer-Murphy 1999, 72–77) lists six steps when designing learning experiences. These are: clarify the purpose of the activity system (what are students' goals, motives and expectations?); analyse the activity system (for example the student as subject, the community in which the subject works, the outcomes that need to be achieved); analyse the activity (such as problem-solving actions); analyse tools and mediators (such as methods, language, forms of work organisation); analyse the context (the real-life, non-instructional contexts within which activities occur); and analyse activity system dynamics (this requires a final assessment of how all the components affect one another).

REALs evolved from and are consistent with constructivist theories. To embody a constructivist view of learning, REALs promote study and investigation within realistic and relevant contexts; encourage growth in student responsibility, initiative, decisionmaking and intentional learning; support knowledge-building learning communities that utilise collaborative learning; utilise dynamic, generative learning activities that promote high-level thinking processes including analysis, synthesis, problemsolving, experimentation, creativity and examination of topics from multiple perspectives to create rich knowledge structures; and assess student progress in content and learning-to-learn through realistic tasks and performances (Grabinger and Dunlap 1995, 10).

The critical attributes and strategies of REALs that support a constructivist view of learning are: student responsibility and initiative that use reciprocal teaching as

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strategy; generative learning activities that use cognitive apprenticeship as strategy; authentic learning contexts that use anchored instruction as strategy; authentic assessment strategies; and cooperative support that uses problem-based learning as strategy (Grabinger and Dunlap 1995,13–32).

In the next section, relevant literature will be reviewed, after which the two research modules will be described briefly and assessed in light of the abovementioned framework.

TEACHING AND LEARNING IN HIGHER AND DISTANCE EDUCATION

In accordance with constructivist thinking, Errington (2008, 1) emphasises the importance of authentic learning tasks within curricula. Authenticity refers to 'learning centred on rich real-world, immersive and engaging tasks' (Herrington and Herrington 2006, 1, confirmed by Marra 2008). Errington (2008, 1) therefore engages students in processes of problemsolving, decisionmaking, critical analysis, evaluation and reflection on real-world problems and choices within a scenario learning context.

In their research report, Schober et al. (2006, 74) explain how they reduced the problems they experienced in the teaching of research methods by designing a course with four goals, all of which concur with constructivist principles:

- factual knowledge – obtained by studying two textbooks and a number of journal articles;

- learning competence – students are 'guided' for self-regulated learning through three phases: forethought, performance and self-reflection;

- collaborative learning abilities – students work together in teams, since social integration, together with success and autonomy, lead to intrinsic motivation (Deci and Ryan in Schober et al. 2006, 75); and

- e-competence – this includes working with an electronic platform and participation in discussion forums.

Didactic principles included networking and anchored instruction (for instance, guidance resulting in concrete actions and feedback on strengths, weaknesses and possibilities for improvement).

The importance of learner support in a DE context has been noted by several authors. For example, Hughes (2007, 349) found that peer and tutor support increased learner retention in comparison with modules where this was absent. She used online tracking to quickly identify at risk learners. The support needed to be channelled to where it was most needed (Hurd 2006, 303). Useful and comprehensive tutor feedback enhanced learner motivation and responsibility.

Another method of student support entails the use of blended learning. Yoon and Lim (2007, 475) focus on this issue and define strategic blending as a purposeful mix of delivery media (particularly face-to-face and various forms of technologies)

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to improve learning. It is useful to involve audio in such an approach. According to Edirisingha, Rizzi, Nie and Rothwell (2007, 89) students enjoy the cooperative support of audio learning because they respond well to sound, listening to conversations about their courses, being talked through tasks, hearing discussions by experts, and being encouraged by the voice of someone they know. Thus, audiotapes as part of study material can increase the retention rate of distance learners. Positive features of audio include its flexibility and convenience (it may be used anywhere and at any pace), the fact that it shifts control over pacing from lecturers to students, and the fact that students may listen to the content several times. This is in line with a renewed interest in radio learning over recent years in developing countries, as well as more broadly internationally (Potter and Naidoo 2006, 63). The use of audio enhances student responsibility and provides cognitive tools in line with constructivist thinking.

Video conferencing can also be used to diminish the distance in DE and support learners. Kumar and Bhattacharya (2007, 111) point out that video conferencing and web conferencing make it possible to reach out far and wide, but caution that cultural differences should be considered, a fact also emphasized by Hurd and Xiao (2006, 205). Cultural differences manifest in terms of different learning styles, interactivity, mutual respect, authority consciousness, hesitation, fear and gender sensitivity. Factors behind these differences relate to local cultures, tradition, religion, beliefs, socioeconomic levels and background barriers.

In their research on learner support, Chen, Wei, Wang and Lee (2007, 605) made use of reading content on the web. They found that students preferred accessing knowledge and joining discussions via the web (in harmony with socio-constructivism) to reading conventional textbooks. A positive correlation was identified between the length of time spent using the system and examination grade (Coogan, Dancey and Attree 2006, 61). Online students also reported higher levels of interest, curiosity, and intrinsic motivation (Stevens and Switzer 2006, 90). This indicates the way in which online DE could transform the orientation of education from teacher-centredness to student-centredness, and thus enhance student responsibility, in accord with constructivism (Barrett, Bower and Donovan 2007, 37; Vishtak 2007, 24). Flexibility, the availability of the instructor, convenience and online interactions were cited as positive characteristics of an online course, while technological glitches and a sense of being lost in cyberspace were cited as negative features (El Mansour and Mupinga 2007, 242; Senior, Reddy and Wood 2007, 439).

Majeski and Stover (2007, 171) have highlighted the challenges facing the DE teacher in using the internet in developing countries when not all DE learners have internet access. Online discussions eliminate the distance between communicators, as learners support one another in a community of collaborative learners (Isman and Altinay 2006, 75; Senior et al. 2007, 439). This is in accordance with the principle of cooperative support in socio-constructivist thinking. New understandings and knowledge construction through online discussion are possible, depending on the

interaction and student cognitive engagement during the discussions (Zhu 2006, 451). Helleve (2007, 267) investigated why a group of DE learners called their group 'The magic group', and learnt that in that particular instance the concept 'magic' referred to the reflective and productive learning process the group members experienced; this process extended far beyond their individual borders.

In comparing outcomes of online learning with traditional classroom teaching, some studies have found no significant influence on student learning or satisfaction (Knight 2007, 87; Shelley, Swartz and Cole 2007, 10). Others (such as Chen, Shang and Harris 2006) concluded that overall an online asynchronous environment can promote student participation in certain cases, although cognitive gains did not seem to be as high as in the face-to-face environment. This indicates the challenge associated with teaching courses in a DE context.

In the development of online communication, staff and student resistance needs to be addressed. It is important both to train lecturers and to familiarise students with online course environments. Connolly, MacArthur, Stansfield and McLellan (2007, 345) found that providing lecturers with some control and flexibility in managing e-learning delivery reduced resistance and enabled them to develop a range of e-learning models to meet learners' needs. Encouraging coherence between learners' needs, lecturers' perspectives, the learning environment and the organisational culture contributed to the development of a supportive e-learning culture. Goodfellow (2004, 379) emphasised that research in this field needs to take account of wider institutional and social contexts if it is to address issues of student resistance to socialisation into virtual learning communities.

THE TWO RESEARCH MODULES

Module 1: Research Methodology

In the DE environment in which the study was conducted, Research Methodology is a fundamental module for the structured master's degree in education with various fields of specialisation (such as Adult Education, Curriculum Studies, Inclusive Education and Socio-Education). Assignments are intended to help students acquire the necessary research skills to complete the activities set for the second research module (the portfolio module), and the dissertation of limited scope that is required for completion of the degree. Students write an examination at the end of the academic year.

The Research Methodology module consists of the following components: fundamental principles of educational research, quantitative research designs and methods *or* qualitative research designs and methods and mixed-method designs (for example action research). The module is intended to enable students to:

• isolate and formulate a research problem; write an acceptable research proposal; develop arguments based on data obtained from the literature; develop arguments on the basis of their own empirical data; arrive at accountable

syntheses and conclusions; manage the writing process effectively; meet the formal examination criteria for dissertations and theses; and write articles based on their dissertations;

• apply some of the quantitative research skills that they have become acquainted with;

• apply some of the qualitative research skills that they have become acquainted with; and

• use a combination of quantitative and qualitative research approaches where appropriate (for action research, for example).

The study material originally consisted of two prescribed books, recommended books, a reader consisting of a selection of journal articles, and tutorial letters. This study package was reconsidered after the first cycle of the action research project, as will be explained in the next section.

For 2008, eight assignments were set (see Table 1). Since students were required to choose between quantitative and qualitative research, all students could be assessed on the content covered by assignments 1 and 8 as well as *either* the content covered by assignments 2, 3 and 4 *or* that covered by assignments 5, 6 and 7.

Module 2: Portfolio

The portfolio module is a core module that focuses on education problems encountered in practice, the analysis and solution of which require students' active involvement. Students are expected to produce a portfolio of their work in their chosen field of specialisation.

The main outcome of the portfolio module is for students to master an appropriate level of research skills for conducting research. In particular, they should be able to:

• reflect critically, and formulate their reflections logically and clearly in writing;

• conduct action research;

• identify problems in the field of education;

• investigate these problems scientifically by means of quantitative and qualitative methods;

• arrive at logical conclusions;

• make recommendations for resolving the problems that are in line with the stated problem and the conclusions; and

• write a research report.

No examination is written. Students complete three assignments (see Table 3). Of these, the action research projects conducted in students' own fields of specialisation are the most important. In line with socio-constructivism students are allowed to do the projects with selected co-researchers at their schools.

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Student support

Students received written feedback on assignments. In accordance with socio-constructivist thinking, the names and contact details of the lecturers responsible for the modules were supplied in tutorial letters so that students could contact their lecturers as needed and thus eliminate some of the distance in DE. Students were also supplied with the names and contact details of their peers on request for additional support. From 2007, students were reminded of deadlines or given brief additional information about assignments via SMS. During the second cycle of the action research project, *my*Unisa was launched. This provided staff and students with an online environment that allowed access to study material (such as tutorial letters and prescribed articles), allowed announcements to be made, and also gave students the opportunity to discuss their assignments and study problems in discussion forums created for each module in line with socio-constructivist thinking. Training was provided for staff who were expected to contribute to and stimulate discussion by regularly checking the forum. The student support provided in each module will be assessed in the sections that follow.

RESEARCH DESIGN

The research took the form of a case study of the two modules described above. Formative evaluation research (McMillan and Schumacher 2006, 440) was conducted over a period of three years, following an action research approach involving two cycles. Data were mainly qualitative, although some quantitative data were used as motivation for the study, in particular examination results.

During the first cycle of the action research project, data collection involved the following: At the beginning of the project, questionnaires were mailed to all students who had just completed the two research modules already mentioned as part of a structured master's programme in education. The students were requested to answer an open-ended questionnaire indicating what they had liked and not liked about the modules, and giving their suggestions for improvement. One student, who was a lecturer at the Institute of Learning and Curriculum Development at Unisa, was also requested to review the research methodology module in his capacity as an expert. A second review of both modules also took place during this time. This review was conducted by a DE specialist contracted by the university in anticipation of a Higher Education Quality Committee review visit. Reflection on the enormous amount of data thus obtained led to the implementation of numerous significant changes, as will be indicated.

During the second cycle, the revised study packages for the two modules were evaluated. To this end, the main attributes of REALs were particularly useful as criteria.

Strategies to ensure the trustworthiness of the findings included a lengthy data collection period of three years; the use of multi-method strategies, as indicated;

self-monitoring during all phases of the research process to detect biases; and obtaining feedback from other lecturers who were also involved in the same modules to corroborate findings.

FINDINGS

The Research Methodology module

An analysis of the questionnaire responses revealed that students expressed a need for the following in particular:

- less emphasis on factual information;

- more exposure to useful information, such as how to do research on the internet;

- more exposure to the practical application of the work;

- more clarity on unclear terminology (students favoured simple, understandable language to help them understand concepts);

- more guidance, such as study guides explaining research issues better and in more detail;

- more guidelines and practical examples, for example of how to construct a questionnaire; and

- more direct and personal feedback on assignments.

Feedback from internal reviews, although mentioning positive aspects, also pointed to a number of shortcomings, the most important of which related to the lack of practical student support and the inadequacy of the reader in the study package.

On this basis, the decision was taken to provide more student support by means of the following: the introduction of discussion classes once per year to negotiate meanings with students and allow for small-group discussion in line with socio-constructivist principles; the inclusion in tutorial letters of expected outcomes and assessment criteria for each assignment; the replacement of the two prescribed textbooks (both locally published and of a general nature) with one international textbook published in the USA and focussing exclusively on education; the removal of the reader from the study package; the replacement of the open-book examination that students normally wrote with a closed-book examination.

During the second cycle of the action research project, as mentioned earlier, *my*Unisa was introduced to the university community. However, this elicited little interest among the relevant students and lecturers. Since socio-constructivism points to the importance of collaboration, discussion and negotiations, the need for familiarising and motivating students and staff for participation in *my*Unisa to facilitate meaningful learning is clear.

The assignments that were set for the module during the second cycle are briefly explained in Table 1.

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Table 1: Research Methodology assignments

Assignment	Nature of assignment
1	50 multiple-choice questions covering the introductory section of textbook; marked by computer.
2	*Writing a research proposal for a quantitative project:* a problem scenario (lack of discipline) described; students identify relevant research problem, aims, quantitative research design and methods.
3	*Questionnaire design and interpretation of quantitative data:* students design a questionnaire (based on literature on motivation supplied); define statistical concepts (eg statistically significant, t-test, chi square); interpret quantitative data given in tables; formulate conclusions and recommendations.
4	*Evaluation of a quantitative article:* criteria are given for the evaluation of the various sections of the article (title, abstract, introduction and literature review, method, results, etc).
5	*Writing a research proposal for a qualitative project:* a problem scenario (bullying at school) described; students identify relevant research problem, aims, qualitative research design and methods.
6	*Design of an interview guide and qualitative data analysis:* students design an interview guide on job satisfaction in education; analyse and present findings, conclusions and recommendations – an interview transcript is provided.
7	*Evaluation of a qualitative article:* criteria are given for the evaluation of the various sections of the article (title, abstract, introduction and literature review, method, findings, etc).
8	*A research proposal for an action research project:* students select a problem in their own field – some problems from the portfolio module are given – and explain proposed planning, action and data collection (quantitative and qualitative).

Table 1 indicates that students are expected to acquire knowledge (about research design, sampling and other research skills) by writing proposals relating to these aspects. This issue is further explored in Table 2, where the study package is evaluated in light of the conceptual framework of the study, in particular of REALs as pedagogic practice.

Table 2: Evaluation of the learning material for the Research Methodology module

REAL attribute and strategy	Evaluation of Research Methodology learning material
Student responsibility and initiative – recip-rocal teaching	Mostly decontextualised activity – assignments completed at students' desks – problems are theoretical; no collaborative learning – students may discuss assignments with other students via myUnisa; guided practice with the writing of proposals, the analysis of qualitative data and the interpretation of quanti-tative data.
Generative learning activities – cognitive apprenticeship	Lecturers have difficulty in modelling appropriate behaviour (DE challenge); lecturers have difficulty in bringing thinking processes into the open – can only model how to perform tasks by thinking aloud during discussion classes (DE challenge); no particular scaffolding provided for tasks – guidance on how to complete assignments obtained through references to textbook and assessment criteria; goals of projects abstract but situated in relevant contexts of schools/workplaces in a theoretical way; students struggle to transfer learn-ing in Research Methodology module to portfolio (DE challenge); generative learning occurs only partially – students produce something of little value (writ-ten assignments).
Authentic learning contexts – anchored instruction;	Assignments anchored in realistic problems, sometimes from own fields of specialisation, and may thus foster ownership; involve complex contexts that students must solve theoretically; do not require students to do team research, and students therefore do not encounter multiple perspectives, have no op-portunity to test ideas, solutions and processes, and must identify resources needed for solutions theoretically.
cognitive flexibility	Assignments provide poorly structured domains theoretically only; study mate-rial lacks a rich variety of examples of research projects to make apparent the variability of concepts and themes and encourage students to look at knowl-edge from several perspectives.
Authentic assessment strategies	Use traditional pen-and-paper methods to assess right and wrong answers – no multi-faceted criteria; do not recognise multiple kinds of intelligence (proj-ect management, research, organisation and representation, presentations and reflection skills); assessment criteria not reliable across multiple scorers.
Cooperative support – problem-based learning	Assignments address realistic problemsolving theoretically only; the assign-ments cover relevant concepts and principles; the problems are presented in a realistic way that encourages students to take ownership of the problem; lecturer as facilitator who asks the right questions and monitors progress has difficulty in interacting with students (DE challenge).

Table 2 highlights a number of issues, most of which are related to decontextualised activities as well as lack of cooperative support, rich examples and authentic assessment practices.

The portfolio module

In their questionnaire responses, many students remarked positively on the portfolio module. One student referred to it as a 'brilliant exercise for the dissertation' while another stated that it was 'A very good experience – thoroughly satisfying' and that it

prepared students well for research and the dissertation that was to follow. However, they also indicated a need for the following:

- clearer guidelines/instructions on what was expected of them;
- more practical examples as guidance;
- more support by means of discussion classes: 'We need training during holidays to share problems with each other';
- more support and guidance from lecturers and study guides; and
- wider choices of problems to research for their action research projects.

In addition to the above, internal reviews pointed to a lack of student support.

The action research projects submitted by students who had failed the previous year were also analysed to determine what their problems were. It was clear that these students had not understood the practical nature of the proposed solutions to action research problems and that they needed the power to implement the solutions. Examples of poor solutions proposed included 'the building of more classrooms', 'improving teachers' salaries', and 'educators should be offered bursaries to study curriculum theory'. Some students selected too many plans, submitting a list of five to ten, wanted to involve too many people (including some departmental officials who would not be available), or offered vague plans (for instance 'empowering teachers' or 'the spirit of selflessness should be inculcated in teachers').

In light of the above, it was decided to provide more student support.

1. In line with socio-constructivist principles that emphasise knowledge-building in a learning community, discussion classes once per year were introduced.

2. The tutorial letters were rewritten to provide clearer guidelines and list expected outcomes and assessment criteria for each assignment. In a bid to improve the action research projects, the following changes were also implemented: Initially, students could select any problem they wanted to. However, since many chose problems that were ill suited for action research, it was decided to provide students with a list of between two and nine problems in each of the fields of specialisation. Examples included: How can a group of educators be prepared for retirement? (M.Ed. Adult Education); How can alcohol abuse among adolescents at a school be reduced? (M.Ed. Socio-Education); and How can a group of educators at a school be motivated for inclusive education? (M.Ed. Inclusive Education).

3. It was decided that the action research project would be divided into three phases. Phases 1 and 2 would be submitted as part of assignments 1 and 2. This provided lecturers with the opportunity to give feedback on the planning and initial stages of the projects in an attempt to improve the final product. In accordance with socio-constructivist principles, this provided assisted learning by scaffolding the learning.

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4. It was decided that students would be supervised by three experienced researchers instead of dividing the portfolios among all the lecturers involved in the teaching of the relevant theoretical modules.

5. Students were provided with feedback on the mistakes previous students had made in completing their action research projects, as well as a fictitious example of a good project.

6. Finally, an external moderator from a residential university was appointed for quality control purposes. She recommended the use of a rubric for assessment to ensure greater consistency among lecturers.

During the second cycle, *my*Unisa was introduced to the university community. Little use was made of this function, however. In consideration of socio-constructivism this provided course designers with a challenge. Table 3 sets out the assignments set for the portfolio module during this cycle.

Table 3: Portfolio assignments

Assignment	Nature of assignment
1	Students reflect on themselves as professionals and on their fields of specialisation; from a list of relevant and appropriate topics they choose a problem in their own fields and indicate how they plan to approach their action research projects. (Counts 10% of final mark.)
2	Students find artefacts in their own fields of specialisation (e.g. five articles, newspaper clippings, policy documents) and write reflective notes on each and an integrated narrative on them all; students report on progress with action research projects. (Counts 10% of final mark.)
3	Students submit portfolios of their action research projects. (Counts 80% of final mark.)

Table 3 indicates that students investigate realistic and relevant contexts for their action research projects. An assessment of the pedagogic practices used in this module follows in Table 4.

Table 4: Evaluation of the learning material for the portfolio module

REAL attribute and strategy	Evaluation of portfolio study material
Student responsibility and initiative – reciprocal teaching	Contextualised holistic activity – projects take place in the schools/students' workplaces – problems are identified and possible solutions generated and implemented and results evaluated; collaborative learning – students identify co-researchers for projects; guided practice in flexible application of questioning, summarising, clarifying and predicting – students submit projects in three phases to obtain guidance as they proceed and use the skills to complete projects and write reports that summarise and clarify, and also plan a second cycle that predicts better results.
Generative learning activities – cognitive apprenticeship	Lecturers have difficulty in modelling appropriate behaviour (DE challenge); lecturers have difficulty in bringing thinking processes into the open – can only model how to perform tasks by thinking aloud during discussion classes (DE challenge); lecturers give guidance and provide scaffolding – projects submitted in three phases and feedback for improvement received; abstract goals of projects situated in relevant contexts of schools/workplaces; students struggle to transfer learning in Research Methodology module to portfolio (DE challenge); generative learning occurs – students produce something of value (portfolios).
Authentic learning contexts – anchored instruction;

cognitive flexibility theory (CFT) | Action research projects anchored in realistic problems from own fields of specialisation and thus foster ownership; involve complex contexts that students must solve; require students to do team research and thus encounter multiple perspectives; provide opportunities to test ideas, solutions and processes; must identify resources needed for solutions.

Action research projects provide poorly structured domains where many solutions are possible; study material lacks a rich variety of examples of action research projects to make apparent the variability of concepts and themes and encourage students to look at knowledge from a number of perspectives. |
| *Authentic assessment strategies* | A portfolio of action research projects used to assess students – includes multi-faceted criteria which were not explained to students previously; does not recognise multiple kinds of intelligence (project management, research, organisation and representation, presentations and reflection skills); criteria not reliable across multiple scorers. |
| *Cooperative support* – problem based learning | Action research projects encourage realistic problemsolving; the projects raise relevant concepts and principles; the problems are presented in a realistic way that encourages students to take ownership of the problem; lecturer has difficulty in interacting with students as facilitator who asks the right questions and monitors progress (DE challenge). |

According to Table 4, a REAL is created through the action research project. However, there is a lack of cooperative support, blended learning and good examples of action research projects provided in the literature.

DISCUSSION OF FINDINGS

Tables 2 and 4 indicate that the main challenges that this study has identified in the teaching of the research modules relate to:

- overcoming staff and student resistance and stimulating online discussion and thus cooperative support by means of myUnisa in both modules in line with socio-constructivist thinking;

- introducing blended learning (e.g. video conferencing and audio) to enable lecturers to bring thinking processes into the open by asking the right questions and modelling appropriate behaviour (e.g. how to conduct interviews), according to socio-constructivist principles;

- providing more anchored instruction by making available published resources (e.g. journal articles) that provide rich examples of quantitative, qualitative and action research projects and that are indexed to specific assignments and chapters in the textbook;

- providing authentic learning contexts in the Research Methodology module by practical hands-on research experience in the selection of quantitative/ qualitative research designs, sampling, implementation of questionnaires/ interview guides with respondents as well as analysing own data and presenting the findings. Problem-based learning of this nature could enhance student responsibility and initiative;

- providing more opportunity for the cooperative support of team research in line with socio-constructivism in the research methodology module;

- introducing authentic assessment practices in the Research Methodology module (e.g. projects).

CONCLUSION

The aim of this article was to identify ways to enhance the learning of research skills by postgraduate students in a DE environment. To this end, improvements were made to two research modules before current practices were evaluated against constructivist principles such as REALs. The study identified some positive aspects in the learning environments created by the two modules, but nevertheless also succeeded in identifying a number of concerns and challenges. This was particularly true of the Research Methodology module, as indicated. The portfolio module assignments were more in accordance with constructivist thinking, although it was also possible to identify some shortcomings. How these may be overcome needs further investigation. In particular, ways to overcome the distance in DE in accordance with socio-constructivism need to be addressed.

Correcting the shortcomings listed above will improve student achievement and attitude as well as the dissertations submitted in fulfilment of the requirements of the course. It will also improve the ability of students (practising teachers) to conduct research to address the problems they experience at school.

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Although the study focussed on the teaching of research methods in a DE context, the findings are relevant and useful for the teaching of all courses in any environment. By taking cognisance of the best teaching practices in HE, academic staff will improve the quality of their teaching and the performance of their students. Ultimately this leads to a better educated population and an improved society.

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