Postgraduate students' attitudes towards research, their research self-efficacy and their knowledge of research

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Abstract

The purpose of this study was to determine the degree to which an online module influenced honours students' attitudes towards research, their research self-efficacy and their knowledge of research. An availability sample (N = 279) of postgraduate students enrolled for an online course in research methodology (n = 97 for semester 1 in 2012 and n = 182 for semester 2 in 2012) at a distance education institution in South Africa was used. The attitude towards research scale, self-developed research self-efficacy and knowledge test were administered in a single group pre-post test design. Dependent t-tests revealed that in general, students' positive attitudes towards research, their research self-efficacy and their knowledge of research increased from the onset to the completion of the module. However, students' perceptions of the usefulness of research for their careers declined and their research anxiety and self-efficacy with regard to data analysis remained unchanged on completion of the module. These findings indicate that addressing students' perceptions of the usefulness of research for their careers and their research anxiety may be more complex than anticipated and that it could be a process that is independent of addressing students' research self-efficacy and their knowledge of research.

Keywords: postgraduate, attitude, online, research self-efficacy, knowledge of research

INTRODUCTION

There appears to be continuous pressure on higher education institutions (HEIs) from both government and employers to produce graduates who are employable (Griesel and Parker 2009). These graduates thus need to have certain attributes, capabilities and dispositions in order to work successfully (Griesel and Parker 2009). One part of the students' personal and intellectual development could be to develop their scholarship (Coetzee and Potgieter 2012). Scholarship can be seen to consist of a combination of problem solving and decision making, analytical thinking skills and enterprising skills (Coetzee and Potgieter 2012). There appears to be an overlap between scholarship and some of the transferable skills that could be seen as the requirements for developing a researcher (Bromley, Boran and Myddelton 2007; Kracker 2002; Manathunga, Lant and Mellick 2007). Since research-led insights affect everything people do in society (Wisker 2008), universities in South Africa are

thus tasked with producing scholars who are able to tackle South Africa's problems through research that is responsive to all of society's needs (International Education Association of South Africa 2009). It is therefore unsurprising that increasing research development with a particular focus on postgraduate degrees is an integral part of the Department of Higher Education and Training's *Revised Strategic Plan 2010/11 – 2014/15* (DHET 2012). The fact remains, there seems to be no escape for students from learning about research (Selaledi 2009).

In an attempt to conceptualise the scholarship of researcher development, Evans (2011, 82) defines researcher development as 'the process whereby people's capacity and willingness to carry out the research components of their work or studies may be considered to be enhanced, with a degree of permanence that exceeds transitoriness'. She goes on to explain that the word 'willingness' is included in the definition to emphasise the importance of the motivational and attitudinal preparedness of researchers. Evans (2012) furthermore argues that researcher development should be understood in terms of its breadth, multidimensionality and complexity. In the light of this, she proposes that researcher development should include a behavioural component, an attitudinal component and an intellectual component. The behavioural component includes an independent and interpersonal activity, while attitudinal and intellectual development include a mental activity (Evans 2011). For the purposes of this study, researcher development was evaluated in terms of the mental activity that changes as a result of the presentation of a module in research methodology.

As would be expected, one of the primary aims of a module teaching research methodology to students would be to first address the students' intellectual component of development. According to Evans's model (2011, 85), this intellectual component can be seen as an element of comprehensive change and 'involves the enhancement or increase of people's research-related knowledge and understanding'. However, according to Bezuidenhout and Alt (2011, 1063), in addressing learning outcomes, lecturers should not only aim to develop knowledge and understanding, but also skills and attitudes that will last in the long term. Their opinion is based on guidelines set by the South African Qualification Authority (SAQA 2001, 21), namely, that achieving learning outcomes should involve knowledge, skills, values and attitudes.

Evans (2012) also points out that the attitudinal component of researcher development has been largely overlooked and that this may be the reason why research behaviour and productivity are not enhanced as expected. In fact, Evans (2011) contends that the attitudinal component of researcher development is the most important and that it is fundamental to a researcher's intellectual and behavioural development. Attitudinal development includes, among other things, change dimensions such as a researcher's perception of the relevance and usefulness of research and his/her self-efficacy (Evans 2011). Consequently, in addition to the development of students' knowledge of research, the development of their attitudes towards research and their research self-efficacy appear to be a worthy goal in a postgraduate module in research methodology.

The purpose of the current study was therefore to determine the degree to which an online module in research methodology presented to honour's degree students at a distance education institution influenced the students' attitudes towards research, their research self-efficacy and their knowledge of research. Students' attitudes towards research, their research self-efficacy and their knowledge of research will now be discussed in more detail.

ATTITUDE TOWARDS RESEARCH

Attitude towards research can be defined as a multidimensional construct consisting of the degree to which students regard research as useful for their profession; they regard research as being of relevance to their life in general; they demonstrate positive attitudes towards research; they experience anxiety about research; and they find research methodology difficult (Panastasiou 2005).

Experience in teaching research methodology and evidence reported in the literature points out that students often harbour anxiety (Bolin, GlenMaye, Hag Lee and Yoon 2012; Kracker 2002) and negative feelings or attitudes towards taking a compulsory module in research methodology (Panastasiou and Zembylas 2008). Onwuegbuzie (2003) goes so far as to say that some students may even view the instructors of research methodology modules as the 'gatekeepers' to the attainment of their degrees. The influence that attitudes have on behavioural intentions has been well established, especially in marketing literature (Curran and Rosen 2006), and students' negative attitudes can therefore serve as obstacles to their learning or even influence their performance in a module (Panastasiou 2005) or subsequent modules on research. In this regard, Onwuegbuzie (1997) contends that students' lack of preparedness when engaging in master's or doctoral studies, despite having taken a course in research methodology earlier, could be the result of their negative attitudes towards research. Onwuegbuzie, Slate, Paterson, Watson and Schwartz (2000) found that research anxiety was negatively correlated to achievement in a quantitative methodology course. Panastasiou (2005) argues that attitudes can influence the amount of effort a person is willing to spend on learning a specific subject like research and the person's attitude can, therefore, in turn, influence the selection of more advanced courses on the subject of research beyond those of minimum requirements. Similarly, it is also believed that having a more positive attitude towards research will lead to intrinsic motivation to engage in research (Evans 2011) – hence the importance of assessing and influencing students' attitudes towards research.

Previous research partially supports the notion that attitude towards research can be influenced by a course in research methodology. Dorfman and Lipscomb (2005) found that graduate music education students who were enrolled for a master's degree and were exposed to research methodology in their course work, reported a more positive attitude towards research after the course. However, they did not necessarily report an increase in their desire either to conduct research as part of their careers

or to pursue further studies in research methodology. Senior nursing students at the largest public university in Jordan, Israel, reported positive attitudes towards nursing research in general, but did not express confidence in their abilities to conduct nursing research after having completed a module in research methodology (Halabi and Hamdan-Mansour 2012). In contrast to these results, Sizemore and Lewandowski (2009) found that students' attitudes towards or perceptions of research and statistics did not improve as a result of completing a research methods course. Moreover, the perceived utility of research showed a significant decline from the pre-test to the post-test. No South African studies could be found that reported on students' attitudes towards research.

RESEARCH SELF-EFFICACY

Research self-efficacy can be defined as the degree to which students are confident in performing different research tasks (Bieschke 2006; Forester, Kahn and Hesson-McInnis 2004; Holden, Barker, Meenaghan and Rosenberg 1999). Research self-efficacy, like the construct attitude towards research, is believed to influence students' choices of behaviour, effort invested, persistence and consequently task success (Onwuegbuzie 2003). Forester et al (2004) argue that research self-efficacy may foster students' research interest and productivity. Statistically significant correlations have been found between research self-efficacy and research productivity (Holden et al 1999). Onwuegbuzie et al (2000) also found that students' expectations of their overall achievement in a research methodology course, together with statistics anxiety, were the best predictor of their overall course achievement, explaining 12.2 per cent of the variance. Steur, Jansen and Hofman (2012) suggest that research self-efficacy could also be seen as an indicator of scholarship. Scholarship would then not only be about basic research skills, but also a scholarly stance towards the world.

It has been shown that it is possible to influence students' self-efficacy in a research methodology module. Holden et al (1999) found that social work students' research self-efficacy increased in a single-semester research course. In their pre-test scores, these students scored the lowest for their confidence in designing and implementing the best possible data analysis strategy. Except for a conceptual study of how mentoring may influence research self-efficacy (Schulze 2010), no other South African studies could be found that investigated the development of students' research self-efficacy.

KNOWLEDGE OF RESEARCH

This module in research methodology is presented to honours students in the College of Economic and Management Sciences at a distance education institution in South Africa. The module is presented as a semester module that runs twice a year. All the study materials and resources, except for the prescribed book, are only available online. The aim of the module is to teach students about the whole research

process in sequential order, including both qualitative and quantitative research. The content includes relevant examples, and in order to address students' anxiety about the volume of work, the module is broken down into weekly content and task assignments. The outcome of the module is to be able to write a research proposal on a given topic. The module is then followed by a module in which students write a research proposal on their own topic as well as a module in which they conduct and report on the research that was planned in the preceding research proposal module. The module in research methodology is, therefore, aimed at equipping students with the necessary knowledge and writing skills to do well in the research proposal and research reporting modules that follow.

Sizemore and Lewandowski (2009) have shown that undergraduate students' knowledge of research could be increased by completing a research methods course. They were, however, surprised to find that the increase in knowledge did not also lead to an increase in students' positive attitudes.

Baltes, Hoffman-Kipp, Lynn and Weltzer-Ward (2010) caution that online courses may present a challenge for research training because they may not be aligned to all students' learning styles or preferences. The question would, therefore, be whether this online module in research methodology could succeed in influencing students' attitudes towards research, their research self-efficacy and their knowledge of research.

METHOD

Design

In the current study, a single group pre-post test design was used. This design is commonly used to measure the effect of an educational programme (eg, Holden et al 1999). Since this design does not allow the researcher to make strong inferences about causality, it is recommended that multiple replications are needed. The study was replicated over two semesters with two separate sample groups. The course content and method of presentation remained the same for both semesters.

Sample

The study population consisted of all honours students registered for an online module in research methodology at a distance education institution in South Africa during the first and second semesters of 2012. A convenience sample of 279 completed both the pre-test and post-test questionnaires online. Of the 279 students, 97 were registered in the first semester of 2012 and 182 in the second semester of 2012. Descriptive information of the sample is provided in Table 1.

Table 1:   Characteristics of the honours students in the sample

	Semester	Category	Frequency	Percentage
Gender	1	Males	35	36.1
		Females	62	63.9
	2	Males	54	29.7
		Females	128	70.3
Age	1	21–27	35	36.1
		28–36	33	34.0
		37–56	29	29.9
	2	21–27	87	47.8
		28–36	50	27.5
		37–56	42	23.1
		Not indicated	3	1.6
Qualification	1	3-year B-degree	80	82.5
		4-year B-degree	12	12.4
		Honours degree	4	4.1
		Master's degree	1	1.0
	2	3-year B-degree	136	74.7
		4-year B-degree	34	18.7
		Honours degree	10	5.5
		Master's degree	1	0.5
		Not indicated	1	0.5
Home language	1	IsiZulu	8	8.2
		IsiXhosa	3	3.1
		Tshivenda	1	1.0
		Sepedi	7	7.2
		Sesotho	2	2.1
		Setswana	2	2.1
		IsiSwati	1	1.0
		XiTsonga	2	2.1
		English	33	33.0
		Afrikaans	32	34.0
		Not indicated	6	6.2
	2	IsiZulu	15	8.2
		IsiXhosa	13	7.1
		Tshivenda	4	2.2
		Sepedi	18	9.9
		Sesotho	8	4.4
		Setswana	9	4.9
		IsiSwati	5	2.7
		XiTsonga	7	3.8
		English	60	33.0
		Afrikaans	22	12.1

	Semester	Category	Frequency	Percentage
		Not indicated	16	8.8
Employment status	1	Unemployed	18	18.6
		Work part time	6	6.2
		Work full time	72	74.2
		Not indicated	1	1.0
	2	Unemployed	33	18.1
		Work part time	21	11.5
		Work full time	128	70.3
Marital status	1	Single	55	56.7
		Divorced	3	3.1
		Married	38	39.2
		Not indicated	1	1.0
	2	Single	108	59.3
		Divorced	7	3.8
		Married	52	28.6
		Seperated	2	1.1
		Widow/er	2	1.1
		Not indicated	11	6.0
Where do students have access to the internet?	1	Internet café At work At home	3 46 48	3.1 47.4 49.5
	2	Unisa centre Internet café At work At home	10 9 78 85	5.5 4.9 42.9 46.7
Have students submitted assignments online before?	1	Never – not studied at this university before	17	17.5
		Never – although I have studied at this university before	5	5.2
		Sometimes	10	10.3
		Always	63	64.9
		Not indicated	2	2.1
	2	Never – have not studied at this university before	20	11.0
		Never – although I have studied at this university before	14	7.7
		Sometimes	40	22.0

	Semester	Category	Frequency	Percentage
		Always	107	58.8
		Not indicated	1	0.5
Number of subjects registered for	1	2	12	12.4
		3	27	27.8
		4	34	35.1
		5	16	16.5
		6	6	6.2
		Not indicated	2	2.1
	2	1	14	7.7
		2	37	20.3
		3	47	25.8
		4	38	20.9
		5	32	17.6
		6	13	7.1
		7	1	0.5

The sample consisted mainly of females (68.10%) between the ages of 20 and 56, with a mean age of 30 and 32 years. Most of the students had a three-year B-degree (77.41%). In total, 33 per cent of the students indicated English as their home language and 19.35 per cent Afrikaans as their home language. In this sample, 71.68 per cent of the students worked full time, 9.67 per cent worked part time and 18.27 per cent were unemployed. More than half of the students (58.42%) were still single. Of the respondents, 44.44 per cent indicated that they mainly have access to the internet only on their computers at work, while another 47.67 per cent indicated that they have access to the internet on their computers at home. It seems that the majority of students (60.93%) were familiar with submitting assessments online before they had enrolled for this online module. Students were registered for between three and five modules on average.

Measurements

Students completed a biographical questionnaire requesting them to report on their gender, age, qualification, home language, employment status, marital status, where they have access to the internet and if they have submitted their assignments online before.

Attitude Towards Research scale

The Attitudes Towards Research (ATR) scale was developed by Papanastasiou (2005) and consists of 32 items measuring five sub-dimensions, namely: research usefulness; research anxiety; positive attitudes relevance to life; and difficulty of research. Items are listed on a seven-point Likert scale. For the purposes of the current research, only research usefulness (the degree to which students regard research as useful for their careers or the perception of how much research will be useful and help them in their professional life); research anxiety (the degree to which students experience fear, stress, tension and difficulty in understanding research); and positive attitudes (the degree to which students generally like and enjoy research) were included. The items for research anxiety were recoded so that a higher score would be an indication of less anxiety. Papanastasiou (2005) confirmed the five-factor structure of the scale and found Cronbach's alpha coefficients of 0.919 for usefulness of research (9 items), 0.918 for research anxiety (8 items) and 0.929 for positive attitudes (8 items). These three dimensions accounted for the most variance in the total ATR scale.

Research self-efficacy scale

On the basis of the work of Forester et al (2004) as well as the specific content covered in the module, a self-developed questionnaire was used to measure the participants' research self-efficacy. The questionnaire consisted of 17 items asking participants to rate their chances of succeeding in various tasks associated with conducting a research project (eg, 'I am confident to effectively choose an appropriate data collection technique'). Response options ranged from 1 = 'strongly disagree' to 7 = 'strongly agree'. The dimensions that were measured included the following: data integration (ie, the degree to which students feel confident to conduct a proper literature review and identify and formulate a relevant problem statement and research questions); design (ie, the degree to which students are confident about choosing an appropriate qualitative or quantitative design for a study); data collection (ie, the degree to which students are confident about choosing and applying an appropriate qualitative or quantitative data collection technique); data analysis (ie, the degree to which students feel confident about choosing, applying and interpreting appropriate qualitative and quantitative data analysis techniques); and writing (ie, the degree to which students are confident about writing a literature review, research proposal or research report). In this sample, Cronbach's alpha coefficients ranged from 0.65 for the post-measurement of research self-efficacy with regard to writing to 0.96 for the pre-measurement of research self-efficacy with regard to analysis and total research self-efficacy.

Knowledge assessment

In line with the work of Arthur, Tubré, Paul and Edens (2003), and Davis and Sandifer-Stech (2006) and the material covered in the module, two knowledge assessments were developed to assess students' general knowledge of research at the onset of the module and again on completion of it. A case study with ten application-

type multiple-choice questions tested students' knowledge of the research process, types of research, variables, sampling, data analysis, hypotheses and the American Psychological Association (APA) style of referencing. A different case study and different multiple-choice questions were used in the pre- and post-assessment, but both assessed the same content. The students' final marks for the research methodology module were used as a quality control measure for the knowledge assessment. In the first semester of 2012, the pre-knowledge assessment showed a weak statistical significant correlation with the students' final marks ($r = 0.236$; $p = 0.024$) and in semester 2, no correlation was evident between the pre-knowledge assessment and the students' final marks. However, in both semesters, the post-knowledge assessment showed a statistical significant correlation with the students' final marks ($r = 0.304$; $p = 0.006$ for the first semester and $r = 0.294$; $p = 0.000$ for the second semester).

Although self-reported gains of learning outcomes are sometimes regarded as having dubious validity and are only indirect measures, they do allow the researcher to capture how a population of students describe their own learning gains (Douglass, Thomson and Zhao 2012).

Procedure

The questionnaire was made available on the module's official website and students were encouraged to submit the first assessment within the first week of the onset of the module. The students were again requested to submit the second assessment in the last week of the module before the submission date of their examination portfolio. The questionnaires were answered and submitted online. Participation was voluntary and students were not rewarded in any way for completing the questionnaires. After providing students with more information on what consenting to the research would entail, the first question asked them to give their consent to participate. Students were required to indicate their student numbers on their questionnaires so that their pre- and post-assessments could be matched and their final examination scores could be retrieved at the end of the semester. They were, however, assured that their anonymity and confidentiality would be protected and that their results would only be reported on in group format. They were also assured that their results would not be used to influence any decisions about their studies in the course, but only for research purposes. Ethical clearance to conduct the research was provided by the university's Executive Director: Research.

Data analysis

The data was captured in an Excel spreadsheet, imported into SPSS and the dataset was cleaned before proceeding with the analysis by using descriptive statistics. The statistical analysis was conducted by means of the SPSS Program Version 20 (SPSS Inc. 2012). Cronbach's alpha coefficients were used to determine the reliability of the various measuring instruments. Thereafter, dependent t-tests were performed to determine the difference between the students' pre- and post-assessment scores with

regard to their attitudes towards research, research self-efficacy and knowledge of research. The effect size of observed differences was calculated by means of the effect size estimate of r and the formula used was $r = Z / \sqrt{N}$ (Field 2009). The interpretation of the effect size was done on the basis of Cohen's (1992) guidelines. Statistical significance was set at 0.05.

RESULTS

Reliability of the measuring instruments and descriptive statistics

The descriptive statistics and reliability of the measuring instruments are shown in Table 2.

Table 2: Descriptive statistics and the Cronbach's alpha coefficients of the measuring instruments

	Number of items	Semester	N	Cronbach alpha coefficient	Mean	SD	Skewness	Kurtosis
ATR Pre Anxiety	8	1	96	0.89	3.94	1.15	0.28	0.15
		2	180	0.88	3.49	1.21	0.66	-0.14
ATR Post Anxiety	8	1	97	0.84	3.85	1.02	0.09	-0.00
		2	179	0.88	3.57	1.15	0.35	0.05
ATR Pre Usefulness	9	1	97	0.84	6.15	0.66	-0.96	1.01
		2	180	0.88	5.89	0.94	-1.50	3.24
ATR Post Usefulness	9	1	97	0.85	5.94	0.78	-0.69	0.09
		2	180	0.92	5.23	0.89	-1.55	3.16
ATR Pre Positive	8	1	76	0.82	5.19	0.71	-0.11	-0.56
		2	170	0.89	5.11	1.10	-0.84	0.74
ATR Post Positive	8	1	97	0.89	5.55	0.92	-0.92	0.85
		2	179	0.90	5.30	1.02	-0.96	1.40
ATR Pre Total	25	1	75	0.84	5.07	0.56	-0.17	-0.50
		2	167	0.92	4.86	0.85	-0.55	1.05
ATR Post Total	25	1	97	0.90	5.15	0.71	-0.32	0.18
		2	174	0.93	4.72	0.82	-0.61	1.10
RSE Pre Integration	4	1	96	0.83	5.00	1.12	-0.56	0.88
		2	179	0.83	5.07	1.12	-1.08	2.05
RSE Post Integration	4	1	97	0.79	5.36	0.86	-0.87	1.66
		2	182	0.83	5.31	0.97	-0.99	1.86
RSE Pre Design	2	1	97	0.89	4.81	1.19	-0.38	0.46
		2	181	0.88	4.82	1.23	-0.85	1.40
RSE Post Design	2	1	97	0.85	5.23	1.00	-1.02	2.41
		2	181	0.88	5.16	0.95	-0.71	0.65
RSE Pre Collection	3	1	97	0.92	5.01	1.17	-0.59	0.30
		2	181	0.91	5.01	1.17	-1.15	2.29
RSE Post Collection	3	1	97	0.92	5.36	1.03	-1.24	3.42
		2	179	0.75	5.30	0.78	-0.54	0.75
RSE Pre Analysis	5	1	97	0.96	4.81	1.18	-0.33	0.20
		2	179	0.94	4.81	1.24	-0.94	1.32

RSE Post Analysis	5	1	97	0.94	4.95	1.09	-1.34	2.95
		2	181	0.88	4.97	0.98	-0.77	1.22
RSE Pre Writing	3	1	97	0.95	4.53	1.36	-0.31	-0.28
		2	180	0.92	4.72	1.36	-0.79	0.69
RSE Post Writing	3	1	97	0.65	5.14	0.93	-0.86	1.20
		2	179	0.81	5.30	0.95	-0.84	2.38
RSE Pre Total	17	1	96	0.96	4.83	1.06	-0.16	0.18
		2	175	0.96	4.96	0.92	-0.72	1.72
RSE Post Total	17	1	97	0.95	5.19	0.85	-1.19	3.37
		2	174	0.94	5.18	0.81	-0.71	1.44
Pre Knowledge	10	1	95	-	4.57	1.36	-0.13	-0.13
		2	179		4.25	1.63	0.55	0.03
Post Knowledge	10	1	84	-	5.60	1.65	-0.11	-0.36
		2	180		5.32	1.59	0.20	0.02

ATR = Attitude towards research; RSE = Research self-efficacy

Table 2 indicates that the Cronbach's alpha coefficients of all the subscales of the measuring instruments were considered to be acceptable compared to the guideline $\alpha > 0.70$ (Nunnally and Bernstein 1994), except for research self-efficacy with regard to writing in the first semester post-test (RSE Post Writing). The results for this subscale should therefore be interpreted with some caution.

Table 2 also indicates that students in both semesters were positive about research in general, valued the importance and usefulness of research for their careers and professional life, but experienced a lot of anxiety about research (the mean rating of anxiety was much lower, indicating higher anxiety). Students in both semesters displayed higher levels of confidence in their ability to conduct a literature review and identify a relevant research question and problem statement (RSE Integration) as well as in their ability to choose and apply appropriate data collection techniques (RSE Collection). They displayed the lowest level of confidence in their ability to write a literature review, research proposal and research report or article (RSE Writing).

Furthermore, it is also evident that several of the sub-dimensions were not normally distributed. It was, therefore, decided to use non-parametric statistics to determine the differences between the pre- and post-test scores.

Differences between the pre- and post-test scores

The Wilcoxon matched pairs test (Tredoux and Durrheim 2013) was used to test whether there was a significant difference between the pre- and post-test scores of students' attitudes towards research, their research self-efficacy and their knowledge of research. The results are displayed in Table 3.

Table 3: Differences between the pre- and post-test scores of students' attitudes towards research, their research self-efficacy and their knowledge of research

	Semester 1				Semester 2			
	N	Z	P	r	N	Z	p	r
ATR Anxiety	96	-0.866	0.386	-	177	-1.323	0.186	-
ATR Usefulness	97	-3.148	0.002	0.32**	178	-9.680	0.000	0.73***
ATR Positive	76	-3.160	0.002	0.36**	167	-2.983	0.003	0.23*
ATR Total	75	-0.544	0.586	-	159	-3.871	0.000	0.31**
RSE Integration	96	-3.239	0.001	0.33**	179	-3.045	0.002	0.28*
RSE Design	97	-3.647	0.000	0.37**	180	-3.735	0.000	0.28*
RSE Collect	97	-3.214	0.001	0.33**	178	-2.837	0.005	0.21*
RSE Analysis	97	-1.264	0.206	-	178	-1.441	0.149	-
RSE Write	97	-4.061	0.000	0.41**	177	-5.975	0.000	0.45**
RSE Total	96	-3.595	0.000	0.37**	168	-4.218	0.000	0.33**
Knowledge	83	-4.482	0.000	0.49**	177	-6.555	0.000	0.49**

* $r > 0.10$ = small effect; ** $r > 0.30$ = medium effect; *** $r > 0.50$ = large effect

Table 3 indicates that during semester 1, there was a significant difference of medium effect from the onset of the module and on completion of the module on all the sub-dimensions of students' attitudes towards research and their research self-efficacy as well as their knowledge of research, with the exception of anxiety and research self-efficacy in data analysis. Students' total attitudes towards research also did not differ at the end of the semester, compared to their attitudes at the onset of the module. During the second semester, significant differences of small (ATR Positive; RSE Integration; RSE Design; RSE Collect), medium (ATR Total; RSE Write, RSE Total; Knowledge) and large effect (ATR Usefulness) occurred for all sub-dimensions of students' attitudes towards research, their research self-efficacy and their knowledge of research, except for anxiety and research self-efficacy in analysing data. The sub-dimensions of students' attitudes towards research increased towards the completion of the module, except for their perception of the usefulness of research which declined from the onset to the completion of the module.

DISCUSSION

The objective of the current study was to determine the degree to which an online module in research methodology at honours level could influence students' attitudes towards research, their research self-efficacy and their knowledge of research. The results revealed that this online module in research methodology succeeded in influencing students' attitudes towards research to some extent. Students harboured more positive feelings towards research on completion of this research methodology

module. Similar to the expectations of Panastasiou (2005) and Evans (2011), it is to be hoped that this positive change in attitude might indeed lead to students being motivated and willing to spend time and effort in learning more about research in consecutive modules or engaging in future research activities in their careers. However, research by Dorfman and Lipscomb (2005) and by Halabi and Hamdan-Mansour (2012) has found that students' attitudes improved after attending a research methodology module, but that they were not necessarily interested in or confident about their ability to conduct research in their future careers.

In this regard, participants in the study indicated that they regard research as useful and important for their future careers, but, similar to the findings of Sizemore and Lewandowski (2009), it seems that students' perceptions of the value and usefulness of research for their careers and professional life were, albeit still rated as high, significantly lower after completing the module. These results are disheartening. Sizemore and Lewandowski (2009) argued that their findings may have been a result of students having unrealistically optimistic perspectives at the beginning of the course or students not appreciating what they had learnt. Another possible reason could have been that students could not see how the research methods could be directly applied in their field of study. Similarly, the findings of the current study could relate to the fact that students from 14 different departments in the Faculty of Economic and Management Sciences are enrolled for this module in research methodology. Generic research methods and examples of research projects are, therefore, presented in the module and not field-specific or department-specific research methods or examples. The most common research methods used in public administration, for instance, may differ from those used in economics. Students may therefore find it difficult to see the relevance of these generic research methods for their future studies in their respective departments. However, an effort is made in the first study unit of the module to indicate how research can improve a person's employability, with the specific aim of emphasising the value of research for the students' future careers. The theme of employability is then also used throughout the module to showcase relevant examples of the research process. This strategy does not, however, appear to have worked, and a different approach may be needed to show students the value of research for their future careers. Sizemore and Lewandowski (2009) are sceptical about a more applied focus in a research methods course reversing these declines in students' perception of the utility of research.

In addition, students' anxiety about research has not been influenced by the module. It would seem that even though students enjoy and feel positive about research, they continue to experience stress, tension and fear about research after completing the module. Bolin et al (2012) found that students' perception of the usefulness of research related significantly to decreased research anxiety. Consequently, since students' perceptions of the value of research declined in the current study, it can be expected that their research anxiety did not decline. It has been argued that students' anxiety about research methods is not related to their lack of ability or inadequate skills, but instead to their perceptions of the nature of a research methodology

course, the amount of work covered, the difficulty of the material covered, their prior experience and fear of negative evaluation (Panastasiou and Zembylas 2008). It is often assumed in the literature that students' fear of statistics or quantitative research methods influences their confidence in research (Panastasiou and Zembylas 2008). However, according to Panastasiou and Zembylas (2008), anxiety about research relates to uncertainty about both qualitative and quantitative methods. In an attempt to lessen students' anxiety, the workload presented in the research methodology module was broken down into weekly sections with a specific programme and study schedule for students to follow. In addition, the analogy of running a marathon was used to encourage and motivate students throughout the duration of the semester. Real-life examples of research in the field of employability were used to illustrate specific research tasks throughout, and students were shown in each study unit how what they were learning would help them to write a research proposal at the end of the module (in order to help them understand research as a holistic process and show them how the research methods are linked to the research questions). The final examination of the module was also a performance-related, open-book assessment and not a traditional examination. These approaches are all in line with recommendations made by Panastasiou and Zembylas (2008) to address students' research anxiety. However, these approaches do not appear to have succeeded in addressing students' anxiety about research in the module. It would also have been expected that an increase in self-efficacy (as shown in the study) might be associated with a decrease in research anxiety, as reported by Bolin et al (2012), but that was not the case either. It would, therefore, seem that addressing students' research anxiety may be more complex than anticipated.

As mentioned above, the results revealed that students' self-efficacy in research increased from the onset towards the completion of the module. In this regard, students' perceptions of their ability to accomplish the following research tasks did appear to improve: using the library to find relevant literature; identifying appropriate research questions; formulating an appropriate problem statement; choosing an appropriate qualitative or quantitative design for a study; choosing and applying an appropriate qualitative or quantitative data collection technique; and writing a literature review, research proposal and research report or article. However, students' perception of their ability to choose, apply and interpret appropriate qualitative and quantitative data analysis techniques did not change from the onset to the completion of the module. Upon closer inspection of the items that were used to assess students' self-efficacy in data analysis in the study, no significant differences were found between their perceptions of their ability to apply and interpret qualitative or quantitative data analysis techniques, thus confirming Panastasiou and Zembylas's (2008) view that students' confidence relates to both qualitative and quantitative methods and not only quantitative methods as is often believed.

Since the final outcome of the module is to be able to write a research proposal, data analysis is only dealt with as part of the overall research process and students are not taught in depth how to use specific analysis techniques. A basic overview of

quantitative and qualitative data analysis techniques is presented to students in two of the 15 weeks of their study programme. It is, therefore, understandable that students might not feel that they are better equipped to deal with applying data analysis after completing the module.

From the results it would seem that students' knowledge of research did improve significantly from the onset of the module. This is in line with expectations and findings such as those of Sizemore and Lewandowski (2009).

RECOMMENDATIONS

It is tempting to suggest that a number of changes should be made in the presentation of the module in order to address students' perceptions of the usefulness of research, their research anxiety and self-efficacy in data analysis. Such changes could be to include more humour and group work (as suggested by Panastasiou and Zembylas 2008) or individualise the pace and instructions of the course to allow students to conduct studies on their own chosen topics and allow them to participate in hands-on community-based research projects in order to gain experience (as suggested by Bolin et al 2012). However, some of these suggestions (say, including group work) might not be feasible because of the number of students enrolled in the module each semester. Other suggestions, such as allowing students to choose their own topic and participate in hands-on research projects, would relate to the scope of the research proposal and research report writing modules that follow on the completion of the research methodology module. It is, therefore, suggested that future research efforts should first involve gaining a better understanding of students' perceptions of the value of research and their research anxiety. More could be done to determine what makes students anxious about research; which factors predict their anxiety; and how they feel their anxiety should be addressed in a module such as this. Follow-up qualitative studies could also explore why students perceive research to be less useful for their careers after completing a module such as this in research methodology.

In conclusion, the online course in research methodology seems to succeed in improving students' attitudes towards research, their research self-efficacy and their knowledge of research. However, more attention could be paid to understanding students' anxiety about research, their perception of the value of research for their future careers and addressing their research self-efficacy in data analysis. It is hoped that this improvement in attitude towards research, research self-efficacy and knowledge of research would not only motivate students to pass their other postgraduate modules that are aimed at applying research, but also to improve their research productivity and overall scholarship in the longer term.

LIMITATIONS OF THE STUDY

These results should be interpreted with caution. The study was based on non-random convenience samples of students at a specific university, using self-report measures.

As a rule, lack of anonymity increases the pressure to respond in a socially desirable way, which may have an impact on self-reported attitudes.

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