

Identifying the challenges of developing research skills in e-learners: an action research study of Masters level public health students in the UK

Sandra Leggetter, Senior Lecturer

Susan Sapsed, Senior Lecturer

Faculty of Health and Social Sciences,

University of Bedfordshire

Bedfordshire, UK

Abstract

Background: Despite the minimum entry requirement for the public health Masters being a degree it became apparent that a number of students displayed a limited knowledge and understanding of research and evaluation. Increasingly distance learning is being adopted in teaching in the UK and when a solely online mode of delivery was introduced the lecturing team started to ask what additional teaching and learning challenges this might present. It also became clear that we needed to explore the nature of our student population, the interaction between student and teacher and re-evaluate our pedagogy.

Methodology: An action research approach was taken. The participants (n=104) were all students undertaking a taught or online masters in public health at a UK university. Demographic data gathered included; highest qualification on entry, mode of learning, international or home student status, prior research experience. Student perception of research knowledge gained on starting and finishing the course and teaching and learning strategies were evaluated. Assessment grades were used as outcome measures.

Findings: There was no difference in attainment between international and home students or by mode of delivery. Qualification at point of entry does not seem to indicate outcome. Student confidence with key skills indicates a fair level of confidence with referencing, citing and ethical issues. However there was less confidence with research methodologies, critical appraisal skills and data interpretation and analysis. As a result of what students identified as effective the changes to taught and online course material are discussed. Future challenges are identified.

Key words: International student's, online teaching and learning, research skills, employability, Masters Degree, public health

Introduction

Over recent years developing effective strategies to improve teaching and learning within UK higher education (HE) has been high on the agenda. The Dearing Report (National Committee of Inquiry into Higher Education, 1997) identified that HE in the UK needs to be *“at the leading edge of world practice in effective learning and teaching”*. Since this report there has been a large number of improvement strategies introduced and Norton (2009) suggests that academics are now working in a rapidly changing environment. Fanghanel (2007) argues that *“in a context of increased massification, teaching has become an activity at the same time more complex (directed at an increasingly diverse body of students in increasingly ‘flexible’ learning environments), more problematized (through educational development and targeted funding initiatives), and more managed (through audits and managerialist understandings of practice”* (p4). Norton (2009) argues that these continuous changes have resulted in academics facing a number of competing demands on both their time and energy. Incorporated into these demands is the need to be excellent at teaching, research and administration.

Although teaching and research are key activities in all universities, Cuthbert (2009) argues that they are often viewed as being separate entities. Hence, by having separate strategies for teaching and learning and research has resulted in them being *“semi-detached from each other”* (p3). Norton (2009) suggests that the current tension between the two has not been satisfactorily resolved and often the choice has to be made as to be a ‘teacher who researches’ or a ‘researcher who teaches’. Cuthbert (2009) argues that teaching, learning and research should not be viewed as separate annexes but

the foundation stones of the building. This paper examines how we are trying to combine teaching, learning and research in a University that is attempting to adapt to the changing forces of information and communication technology and globalisation by probing into academic challenges and practices that accompany these changes.

Carr & Kemmis (1986) identify macro and micro levels as the first of five dimensions which help distinguish different types of curriculum research. They explore relevant research studies that investigate the macro level in terms of the education system as a whole; the effects of education and family in relation to inequalities, educational policies at systems level, and individual school (and classroom) curriculum research. They suggest that in a technological age, where knowledge is viewed as a product, the systems view is attractive as students who go through the system are duly rewarded with access to positions of the greatest opportunity, influence and reward. The micro levels is discussed by Carr & Kemmis (1986) in terms of studies that explore the ‘*specific interactions between teachers and students*’ (p22) as these can identify some revealing insights about the consequences of different kinds of learning opportunities and learning processes. Although it is impossible to discount the macro level, particularly in terms of initiatives that have been introduced in light of such UK government publications such as ‘The Future of Higher Education’ (Department for Education & Skills (DfES), 2003a) and Widening Participation in Higher Education (DfES, 2003b), the main focus of this study will be on the micro level, in terms of looking at interaction between student and teacher and pedagogical belief.

Rationale

Whilst recruiting for our Masters in Public Health course it became apparent that there were many more enquiries from potential students than applications received. Despite a considerable number of potential students showing an interest in the course we identified that the majority of these did not go on to recruitment and we questioned why this might be. In order to try and find out we conducted an audit whereby all applicants (n=88) were emailed a short questionnaire. Responses identified that the 80% attendance requirement was problematic for the majority of them. The strong message that came across was the need to offer a course that was delivered purely by distance learning. With this need identified we launched the online Public Health Masters course in 2007 (Sapsed *et al.*, 2008).

Reynolds *et al.* (2002) argue that learning is a process of acquiring new knowledge, skills and capabilities. For this to occur Pedler *et al.* (1991) suggest that learning organisations must facilitate the learning of all its members and continually transform themselves. However, as there is now the additional expectation for graduates to demonstrate high level employability skills (Yorke, 2006), it is no longer acceptable for HE’s to just concentrate on subject specific learning (Pedagogy for Employability Group, 2006). Jenkins *et al.*, 2007, p3) reinforce this viewpoint by stating that ‘*teaching students to be enquiring or research based in their approach is central to the hard-nosed skills required of the future graduate workforce*’. In the UK the standard-setting body for specialists in public health is the Faculty of Public Health. This body clearly defines the competencies required to work as a practitioner within this field and our course has incorporated these into its curriculum. The course learning outcomes are well aligned with the three domains of public health practice - health protection, health improvement and service quality (Faculty of Public Health, 2009). Central to public health practice is knowledge and understanding of research and evaluation. Practitioners must have an understanding of research methods appropriate to public health practice; including epidemiology, statistical methods, data handling and interpretation skills, critical appraisal skills and other methods of enquiry including qualitative research methods. It is essential that our curriculum prepares students for employment, be it in the UK or international, and hence, this was one of the key drivers for conducting this study.

Whereas Brew (2006, p44) states that “*By the time students reach university, they have already had considerable experience in investigation, in project research, and in inquiry based learning at school*” Schroeder (2004) disagrees. He suggests that contemporary students entering HE have changed dramatically which has resulted in many experienced lecturers feeling both ‘*bewildered and frustrated*’. Schroeder (2004) proposes that many HE students display a lack of confidence in their intellectual abilities and are uncomfortable with abstract ideas. He further suggests they have difficulty with complex concepts, a low tolerance for ambiguity, are often less independent in thought and judgement and more dependent on the ideas of those in authority. They are also more dependent on immediate gratification and display more difficulty with some basic academic skills. Schroeder (2004) suggests that these students require a practice-to-theory approach rather than the more traditional theory-to-practice approach.

When developing and launching our Masters in Public Health we shared similar expectations to Brew (2006). However as time passed it soon became apparent that this was not the case in our student population and we observed many of the traits described by Schroeder (2004). This was further supported when we asked the 2007 student cohort about their research experience prior to enrolling on the course and discovered that 28% had no prior research experience and 22% had only limited experience (n=32). Hence, 50% of our students entered the course without the level of research knowledge we had anticipated. As the Faculty of Public Health’s learning outcomes require students to be able to

design studies, critically appraise published papers and draw appropriate conclusions from quantitative and qualitative research it is important that we use effective teaching strategies that complement our students learning approaches so that students gain the research skills required for 'real world' practice.

Our diverse student population, which includes a large number of international students (mainly from the African and South Asian Continents) who have not previously studied in the UK, face difficult challenges in their studies. One international student recorded in his reflective journal "*hmmm...i hope I can handle all these??? (modules) quite different, the method of study here, assignments and all as compared to practicals and exams in Nigeria*". Experience highlights that academic skill in such student populations are variable with many struggling with basic concepts. Things such as literature searching, evaluating the quality and content of the literature and referencing are not familiar to many of them. The notion of independent and self-directed learning appears to be a particularly challenging concept to grasp. Although it has been argued that the key to getting and keeping students actively involved in learning lies in understanding learning style preferences (Halstead & Martin, 2001) Anderson (1988, cited by Smith, 2001) argue that many learning style models are underpinned by 'Western' assumptions and do not consider differences in cognitive and communication styles that may be culturally biased. Internationalization (see Hyland *et al*, 2007), however, is but one of the trends facing HE today. Increasingly distance learning is being adopted in teaching both in the UK and abroad (Swain, 2007). With the introduction of this mode of teaching, and the knowledge that the type of student entering higher education has changed, it became clear there is a need to respond to these changes. In order to know that what we are teaching has real value we can benefit from understanding both the effect of how we are presenting our material; and to whom we are presenting it. One major issue for us as educators is to come to an understanding of the nature and level of support required by students to gain the most from their learning activities. This study will not only allow us to explore which teaching approaches enhance learning but will also allow us to evaluate whether the learning experiences in both the campus-based and the online courses is similar. Our findings will identify how future provision needs to change in order to improve the student learning experiences and enhance their research and evaluative skills.

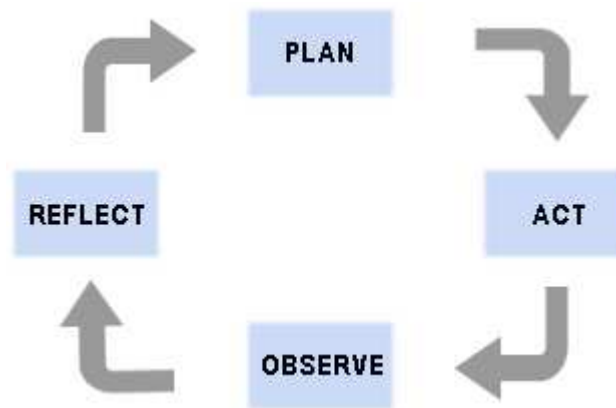
Methodology

An action research (AR) approach was adopted. Action research is a form of research that focuses on the effects of the researcher's direct actions of practice within a participatory community with the goal of improving the performance quality of the community or an area of concern (Reason & Bradbury, 2001; McNiff, 2002). One definition offered by Carr and Kemmis [1986, p162] is:

" Action research is a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out"

Dick (2002) describes action research as a flexible, spiral process that is well suited to situations where change (the "action") and understanding (the "research") need to be achieved at the same time. In other words this spiral process allows informed change that is informed by that change. However, Smith (1996, 2001, 2007) suggest that we should be cautious about accepting the concept of an AR spiral purely in terms of it being a '*one-fit-all*' template for all phases of the study as there may be the tendency to forget that this method is interpretive and, therefore needs to be thought of in terms of making refinements as the study progresses over time. Hence, for the purpose of this study AR will be referred to as being a cyclical, rather than a spiral, process. This research method allows experience to facilitate learning, and therefore, an action research study does not begin with a fixed hypothesis but can begin with quite imprecise research questions. It allows enough flexibility to allow "*imprecise beginnings while progressing towards appropriate endings*" (Dick, 2002, p5). As AR is interpretive it is only after the research cycle has been repeated and study refinements made, can teaching practice be reviewed holistically (Norton, 2009). This aspect of AR is key with this study as it is looking at different groups of students over time, making changes to practice and then re-evaluating these changes in line with the findings. At its core, action research allows the researcher to test new ideas and implement action for change.

Figure 1: Action Research Cycle

**PLAN - Identifying and defining the problems:**

Our students come from a diverse range of backgrounds and as many as 50% begin the course with limited understanding of many of the concepts of research methodology. Assessments suggest that many students are unfamiliar with a number of key graduate skills that, arguably, should have been developed during undergraduate studies. Elements that prove particularly difficult are referencing, critical analysis of literature and literature searching. As a result of our observations we asked:

- are some students displaying more problems than others? For example do international students have similar levels of academic skills as home students who have already experienced the UK HE system? Are there differences in ability and expectations within the students who enroll for the online method of course delivery? Does qualification level at point of entry impact on the outcome?
- if attending students have difficulty with developing research skills is this the same for the online students and, if so, what strategies can we use that will be equally effective for the all students?
- how do we ensure that all our students gain the research skills required for ‘real world’ practice?

ACT – selecting a course of action:

It became apparent that there was a need to formally explore the background of the students, listen to their voices in terms of which specific research skills they needed to develop further and investigate which teaching approaches are effective in enabling them to do this. Only by doing this would it be possible to ascertain if our perceptions of student ability are in line with Brew’s (2006) perception of HE students’ or whether they mirror those of Schroeder (2004). In other words we needed to evaluate our teaching and learning and ensure that the ‘student voice’ is being listened to. Possible methods of doing this were explored and it was agreed that employing action research was the best method to facilitate this. A research protocol was drawn up and local research ethical approval gained. Funding was acquired from the Centre of Teaching and Learning (CETL) within the University of Bedfordshire.

COLLECT – data collection methods:

Data was gathered using a variety of approaches and incorporates both quantitative and qualitative data collection methods:

Quantitative data:

- Questionnaire based tools;
 - Student demographics – academic level on entry, research experience, mode of delivery being undertaken, international or home student, full or part time
 - Student perception of research skills on entering the course and again on completion. Students were asked:
 - to rate on a scale of 0-10 their confidence of key research skills.
 - to identify which skills they specifically wanted to develop (on entry) and whether this has been achieved (on exit)
 - to state which teaching and learning strategies they found effective and what we could do differently.

- Outcome measures – research methods assessment grades (completed early in the course) and dissertation grades (final assessment before completion) were used as indicators as to whether their perceptions of their skills were evidenced in their academic assessments and whether their knowledge and understanding had developed over time.
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Qualitative data:

- Semi structured interviews of a sub section of students at the start of the course and those who have completed. These have not yet been undertaken and will be conducted by an independent researcher in the near future.

All Masters students enrolled on the course since 2006 have been asked to participate in this study. To date the sample size is 104.

Results:

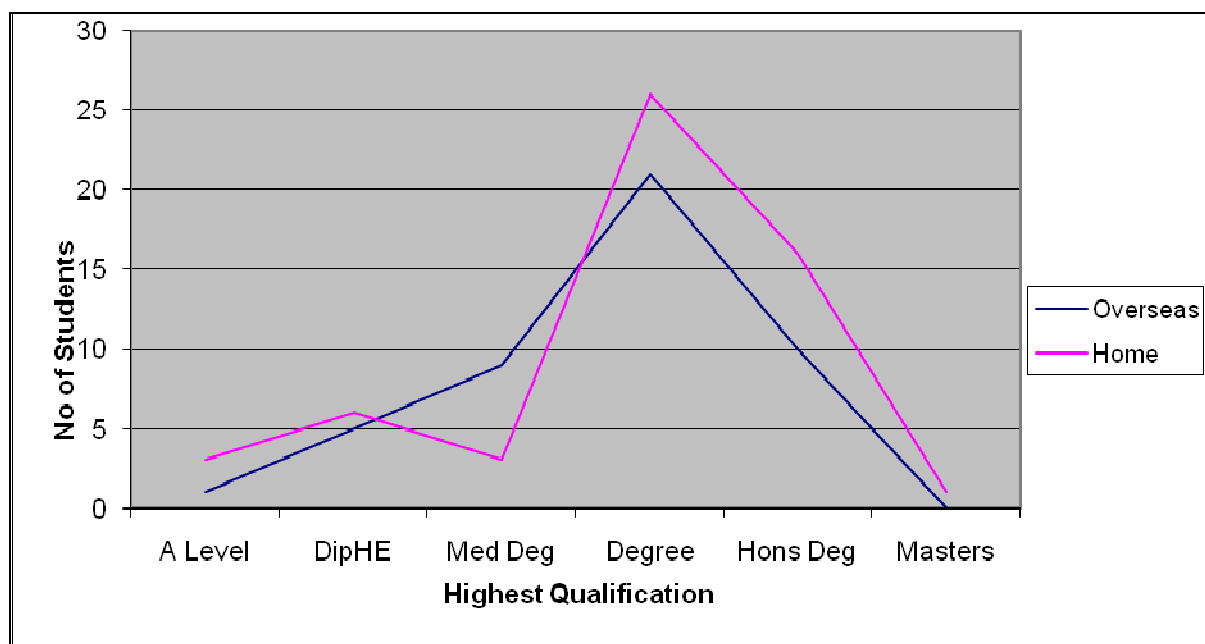
Table 1 illustrates that the majority of students (71%) undertook the course via the traditional taught approach and studied full time (72%). Two students opted to continue their studies during late pregnancy and post birth via the online mode of delivery.

Table 1 – Demographic Data

Mode of delivery n=104	Traditional taught 74 (71%)	Online 28 (27%)	Combined¹ 2 (2%)
Course duration n=103	Full time (1 year) 74 (72%)	Part time (2years) 29 (28%)	
Origin of student n=104	International 46 (44%)	EU 3 (2%)	Home² 51 (54%)

¹ undertook some elements of the course online due to pregnancy ² not necessarily educated in the UK

Chart 1 shows entry qualification by international or home status (n=104). Analysis indicates that there is no significant difference in entry qualification between groups. When groups are combined 73% (n=76) of student's entered with the course minimum entry requirement of a degree. It is worth mentioning that of these the majority (n=49, 64%) had gained an unclassified degree, and therefore, may not have completed a final research project / dissertation during their studies. A further 11% (n=12) entered with a medical degree. One student had already completed a Masters degree. Perhaps surprisingly 14% (n=15) of students did not meet the minimum entry requirement and were enrolled with just A levels or a Diploma in Higher Education (DipHE). However, although the numbers are small, there is no indication that these students performed any differently to those with higher level entry qualifications and all completed the course with no referral work. Interestingly of the 7 students who failed their dissertation on first attempt 4 have an honours degree, 2 a medical degree and 1 an unclassified degree. Failures were evenly spread across the international and home students (n=4 & 3 respectively).

Chart 1: Entry Qualifications by Mode of Delivery

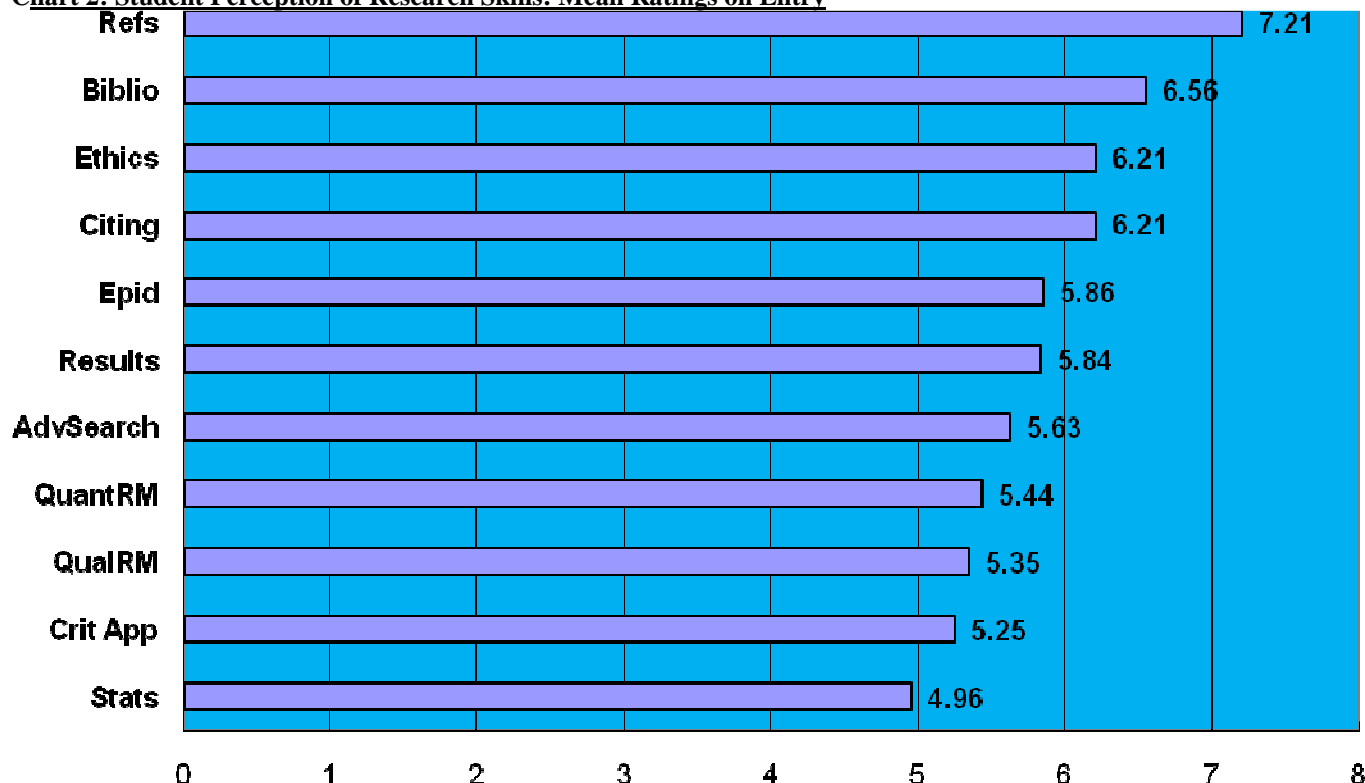
Research Methodology Unit Content

Students were asked about their satisfaction with the content of the research methodologies unit. Of the 57 respondents only 9 (15%) were totally satisfied with the teaching material and did not feel any change was needed. One key issue identified by 20 students (35%) was time and the need to have additional timetabled sessions. 10 (17.5%) identified a need for more coverage of statistical analysis.

When exploring the research skills students felt they needed to develop on entry to the course just under half of the respondents indicated that they wanted to develop all skills (n=104). Interpreting data was identified by 22%. When the participants who have completed the course were asked which skills they did not feel they had been able to develop sufficiently all identified that they had not developed data analysis skills (n=47,100%).

Skills Development

Student perceptions of their research skills on entry to the course were gained. Students were asked to rate on a scale of 0-10 how confident they felt with each of the research skills listed; a score of 0 indicates no confidence and a score of 10 indicates the respondent is fully confident. This questionnaire was introduced as a data collecting tool with the 2008-9 cohorts (n=57). Mean scores were calculated and the ratings can be seen in Chart 2. The factor students rated themselves as most confident at is referencing (M=7.21) and producing a bibliography (M=7.21). Statistics was perceived to be the aspect of research that they felt least confident with (M=4.96). The analysis also indicates that they feel relatively unconfident with their critical appraisal skills (M=5.25) and knowledge of quantitative (M= 5.44) and qualitative (M=5.35) research methods.

Chart 2: Student Perception of Research Skills: Mean Ratings on Entry

Outcome Measures – Assessment Grades

Assessment grades were used as outcome measures to ascertain whether there was a difference in performance by international students versus home students. Table 2 illustrates the grades for the Research Methodologies assessment which is completed in the first term of the course. There is no significant difference in grades between international and home students. Table 3 illustrates the grades for dissertations by origin of student and again there is no significant difference between groups. However, it is worth noting that although all failures were found in international students overall the sample size is very small so presumptions cannot be made. When grades and mode of delivery were explored, once again, there was no significant difference between groups.

Table 2: Research Methods by Grades Origin of Student

	A	B	C	D	Fail	Total
International Students	1	12	11	17	3	44
Home Students	1	30	10	14	0	55
Total	2	42	21	31	3	99

Table 3 – Dissertation Grades by Origin of Student

	A	B	C	D	Re-Sit	Diploma*	Total
International Students	1	8	3	7	4	0	23
Home Students	3	8	2	4	3	1	21
Total	4	16	5	11	7	1	44

*Did not complete dissertation and awarded a diploma

REFLECT – Discussion

Lecturing staff on the Public Health Masters perceived that a significant number of international students were entering the course without the underpinning knowledge base or experience of research methods. Hence, quality

of their work was judged to be low. Likewise, it was perceived that as developing research skills within the taught cohort was challenging the students studying via the online mode of delivery would be disadvantaged as they are limited by the amount of opportunities available to gain the face-to-face support from lecturers and/or peers. As research underpins the whole curriculum it is important that students are facilitated to develop key skills that will enable them to successfully complete the course and evidence a high level of employability skills (Public Health Faculty, 2009; Yorke, 2006). This study has enabled us to explore some of these perceptions and to evaluate what actions can be taken to ensure that teaching and learning strategies are effective for both taught and online students.

Analysis to date suggests that both international and home students achieve at the same level, which is in opposition to the perceptions of the lecturing team. However, what the study has not determined is why this may be. In other words it is not possible to identify whether the students who achieve the lower grades do so for the same reason. International students are limited to the number of hours they can work and therefore may, potentially, have more time to concentrate on their studies yet find this difficult because of the lack of the required skills. Conversely, perhaps the home students are attempting to study whilst working full time and time management, not lack of skill, is the key reason they do not achieve their full potential. In order to try and identify any underlying factors that may impact on learning further exploration is necessary. At present there is no evidence to suggest that the online students are achieving any differently from the attending students. However, numbers of online learners are small and as we re-visit the AR cycle with future cohorts and sample size increases this may change. Carr & Kemmis (2002) state that by concentrating on the micro level, insights into different learning opportunities and learning processes should be revealed. By incorporating additional questions about work/life balance into the data gathering questionnaires and providing students with the opportunity to express their views on external factors that may have the potential to impact negatively on their study a deeper understanding may be gained. Similarly student engagement and motivation will be evaluated by accessing course statistics to determine how frequently individual students access online teaching and learning material and explore if those who engage more achieve higher grades..

Shroeder (2004) offers his perception of contemporary students entering HE today and what is being observed amongst the Public Health Masters students within our institution emulates these perceptions. Although they identify a relatively high confidence level in terms of referencing, ethics and citing authors it is clear from assessments that this confidence is somewhat misplaced. Students are displaying less confidence with research skills such as qualitative and quantitative research methods, critical appraisal skills and statistics. When questioned about skills they felt they had not achieved at the end of the course, unfortunately, all still identified a lack of understanding and confidence with data analysis. This highlights the need for the teaching team to explore how this can be addressed. If, as Schroeder (2004) suggests, contemporary students need a more practice to theory rather than a theory to practice approach this is something that that needs to be considered within the teaching strategy.

Students identified that additional taught research sessions are needed. However, this is not always possible and would not benefit the online students. In order to facilitate more autonomous and critical thinking learners perhaps the best way to approach this is to utilise the online technology available and increase the range and number of online tasks that students can do to enhance their learning. Students have already evaluated video and podcast material well and as a result more of this type of material has been incorporated into online teaching material. Additionally more 'workshop' type of activities has been introduced in the classroom setting whereby students are given relevant published material and work in groups to critically analyse and discuss in terms of research and its implications for public health. The challenge now is to explore how this can be adapted for the online students. One solution may be to re-evaluate how the Wiki is utilised and make this much more prescriptive so that specific research related tasks guide student learning activity. This year new online activities are being introduced in light of student feedback. These include such things as more online discussion forums, and the inclusion of games (such as crosswords and hangman) as educational tools.

This study is beginning to address the research questions posed. Findings suggest that knowledge and understanding of the research process is a challenge for a large number of students regardless of where they were previously educated. However, it is worth noting that many students, who have migrated to the UK and are now classified as home students, may well have completed their education in another country. There is now the need to now explore in greater depth where higher level education was achieved to clarify if, in fact, those educated overseas do face more challenges in relation to prior skills and knowledge. Likewise, the mode of learning does not seem to impact on outcome. Interestingly data suggests that qualification level at point of entry is not necessarily an indicator of outcome.

In light of this finding this may be something that needs to be explored at an institutional level as it may have implications for policy in terms of entry criteria for Masters level study.

In line with the AR process the research cycle will need to be repeated and data gathering tools refined to allow for new ideas to be implemented and evaluated and for research questions to be developed further. One key priority is to develop more online material in order to facilitate the development of research skills, particularly in areas such as data interpretation, data analysis and critical thinking, as these have been identified by students as being particularly challenging. These have also been identified as challenging skills that are not being developed sufficiently throughout the course. Only by constantly reflecting on, and evaluating our teaching practice will the student experience be enhanced and our pedagogical knowledge improved.

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