TEACHING RESEARCH METHODS
An Occasional Paper

Ms Anthea Groessler

Institute of Teaching and Learning Innovation (ITaLI)
The University of Queensland

September 2017
Executive Summary

This paper was produced in response to a request from UQ Heads of Schools to investigate good practice for teaching research methods and to provide recommendations based on findings from the literature. A literature review was conducted to investigate previous studies that could provide insight into good practices for teaching research methods. Studies from multiple disciplines and countries were sourced and considered.

The literature revealed common challenges around teaching research methods for both students and educators; many of these stem from the need to alter teaching practice from principally lecture-based to active and authentic learning strategies. Three ‘meta’ studies around teaching research methods proved particularly useful for developing recommendations for teaching research methods, and these papers form the core of this document. These recommendations include:

1. Make research visible by connecting learners to research (active learning)
2. Immerse students in actual research (authentic learning)
3. Encourage students and educators to reflect upon the research process to enable them to position themselves in the bigger picture (reflexive learning)
4. Encourage a ‘pedagogic culture’ through discourse and debate between academics and sharing of successes and challenges around teaching research methods
Table of contents

TEACHING RESEARCH METHODS ........................................................................................................1
Executive Summary ..........................................................................................................................2
Introduction ......................................................................................................................................4
Method ...........................................................................................................................................4
Findings ........................................................................................................................................5
Discussion ......................................................................................................................................6
  Challenges in Teaching and Learning Research Methods .............................................................6
  Discussion of the Meta Studies .......................................................................................................7
  Themes and Recommendations from the Meta-Studies .................................................................8
Example studies ...............................................................................................................................11
  Example 1: Does Active Learning Improve Students’ Knowledge of and Attitudes Toward Research Methods? .........................................................................................................................12
  Example 2: Teaching Research Method Using a Student-Centred Approach .................................13
  Example 3: Learning and Teaching Research Methods in Management Education
  Development of a Curriculum to Combine Theory and Practice—A Swiss Case .......................14
Developing a Pedagogic Culture Around Teaching Research Methods .........................................15
Conclusion .......................................................................................................................................15
References ......................................................................................................................................16

APPENDICES ...................................................................................................................................18
APPENDIX A: Teaching Research Methods Bibliography .................................................................18
APPENDIX B: Teaching Research Methods Analysis Table .............................................................18
APPENDIX C: Defining Active, Authentic and Reflexive Learning .....................................................18
APPENDIX D: Strategies for Active, Authentic and Reflective Learning .............................................18
APPENDIX E: Teaching Research Methods Needs Analysis Framework ............................................18
Introduction

Research methods are considered a complex domain in higher education. They are dependent upon epistemological beliefs, influenced by the discipline, and involve a ‘combination of procedures and definitions upon which the academic community cannot agree (Earley, 2014, p. 218)’. Researchers do, however, agree that there are longstanding challenges around teaching research methods, regardless of methodological approach, discipline, or year level (Lewthwaite and Nind, 2016; Kilburn et al, 2014; Earley, 2014). These challenges largely stem from students feeling disconnected from the process and culture of research—they struggle to understand what they need to know, what they need to do, and where they are positioned in the wider research landscape (Lewthwaite and Nind, 2016; Kilburn et al, 2014; Baglin et al, 2017).

This discussion paper focuses on pedagogical strategies that educators and researchers have found can successfully address some of the common challenges around teaching and learning research methods. Active learning will play a prominent role in this paper because it frequently emerged from the reviewed literature as a successful strategy for teaching research methods. The use of active learning is supported by significant research findings (Butchart et al.,2009; Crouch and Mazur, 2001; Deslauriers et al, 2011; Freeman et al, 2014; Froyd, 2007) and aligns with Goal 2 of The University of Queensland (UQ) Student Strategy.

In this paper, we explore the findings from the literature review, with particular emphasis on three key studies that synthesise other literature and/or conduct a deep analysis of how student engagement with research methods can be improved. To help educators contextualise the findings from the literature, we have provided a series of short case examples to highlight how singular studies employed active and student-centred approaches that may be of value to educators who are developing or refining their own teaching of research methods. Finally, we present a needs analysis framework, based on the literature, to help educators identify the challenges and potential successes around teaching research methods. This may also be useful as a guide to inform strategies to address teaching and learning challenges at the faculty, school, or individual level.

Method

A literature search was conducted with UQ Library staff using the search terms ‘teaching’, ‘research’, ‘methods’ and ‘higher education’. The ERIC database was used for this search to focus principally on articles from educational research. The search located 66 journal articles, which were further analysed using a survey tool to collect further details such as: the teaching approaches used (particularly active and student centred); course design; evidence of improvement to student engagement and students’ involvement in research practices.
After this analysis, the 66 articles were refined to a group of 26, each of which provided a detailed explanation of an educational activity in which students engaged with the process of research and showed an improvement in their grasp of research methods and/or processes. From there certain articles were selected if they simultaneously met parameters of use of active and student centred approaches, whether students undertook research activities and if they showed an improvement in their engagement with research methods. In the initial collection of 66 studies a further three ‘meta’ studies were found, where authors conducted extensive research into teaching research methods or synthesised the literature of others.

Findings

From the group of 26 articles (see full bibliography in Appendix A), the majority of the studies located were from the social sciences disciplines (48%) as shown in the Table 1 below. A detailed analysis of each article in terms of year level, delivery mode, teaching approach, course design, student activity in research and evidence of improvement to student engagement is provided in the TRM Analysis Table Appendix B. From the TRM Analysis Table we were able to identify which key parameters were met simultaneously to help inform the selection of articles as possible case studies.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>No. of articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>4</td>
</tr>
<tr>
<td>Education</td>
<td>3</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>5</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>12</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Information Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
</tr>
</tbody>
</table>

Amid the initial search of 66 papers, the most significant findings were from three ‘meta’ studies that specifically investigated teaching practices in research methods across methodological, international and disciplinary boundaries. These papers yielded valuable insights and themes principally around the need for active, authentic and reflexive pedagogies to support effective teaching of research methods. These findings also align with key parameters of this study around active and student centred learning and opportunities for students to engage in research. These ‘meta’ studies further highlighted the need for a ‘pedagogic culture’ amongst educational researchers and practitioners, and are contextualised around the challenges that learners and educators face in teaching and
learning research methods. It is the findings from the meta studies that form the lynchpin of this paper and are discussed in greater depth in the next section.

**Discussion**
In filtering the literature on teaching research methods, we found three key papers that explicitly studied the teaching of research methods across methodological, international and disciplinary boundaries: Lewthwaite and Nind (2016); Kilburn et al (2014) and Earley (2014). Firstly, we synthesise the learner and educator challenges that these authors cite as impediments to teaching and learning research. Secondly, there is a brief description of each meta study; and thirdly, an ‘unpacking’ of the themes that emerge from these authors that in turn form the recommendations for this paper.

**Challenges in Teaching and Learning Research Methods**
Many authors preface their studies by citing issues around students’ perceptions of studying research methods that is a ‘dry’, ‘uninteresting’, and ‘complicated’. There is reference to a lack of connection that suggests that students struggle to understand what they need to know, what they need to do, and where they are positioned in the research landscape (Kilburn et al, 2014). Table 1 shows a synthesis of many of the common characteristics and challenges that learners and educators face in teaching and learning research methods.

<table>
<thead>
<tr>
<th>Learner Characteristics and Challenges</th>
<th>Educator Characteristics and Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Anxiety or aversion towards quantitative methods (many students feel ill-prepared for the mathematical component)</td>
<td>• Lack of research on assessment and what and how students learn in research methods courses</td>
</tr>
<tr>
<td>• Students fail to see the relevance of the course to their major and their lives</td>
<td>• Research is a complex domain involving a combination of procedures and definitions, many of which the ‘academic community itself has no uniform conception of’ (Lehti and Lehtinen, 2005, p. 218 cited in Early, 2014)</td>
</tr>
<tr>
<td>• Students are typically anxious or nervous about the course and its difficulty</td>
<td>• Lack of ‘pedagogic culture’ (Wagner et al., 2011) in research methods teaching and little guidance available to teachers</td>
</tr>
<tr>
<td>• Students are uninterested and, therefore, unmotivated to learn the material</td>
<td>• Teaching by methodological experts who do not have a pedagogic background</td>
</tr>
<tr>
<td>• Students come to the course with poor attitudes towards, or misconceptions about, research</td>
<td>• Difficulties with teaching the complexities of research methods to students who are new to research</td>
</tr>
<tr>
<td>• Student diversity results in culturally diverse perceptions of what constitutes research</td>
<td>• Instructors must somehow demonstrate interrelated tasks and complexities so that students new to the research process (and those not typically majoring in research methodology) can understand and ultimately apply the approaches</td>
</tr>
<tr>
<td>• Varied levels of student competence and confidence in second or third languages</td>
<td>• Few undergraduate students are actively seeking careers in academia; hence most students see little value in learning skills they perceive as relevant only to research in their discipline</td>
</tr>
</tbody>
</table>
Researchers involved in the studies of teaching research methods contend that reliance on the lecture format to teach research methods is risky because of the abstract nature of the content when a more ‘experiential and hands-on approach may be required’ (Pfeffer, & Rogalin, 2012). Further, that active and student-centred learning approaches may help reduce students’ anxiety and negative feelings about research (Earley, 2014).

Discussion of the Meta Studies

The three meta studies by Lewthwaite and Nind (2016), Kilburn et al. (2014) and Earley (2014) address teaching methods across methodological, international and disciplinary boundaries. From these studies, key themes emerge (principally from Kilburn et al, 2014) around the need for active, authentic and reflexive teaching strategies (see Appendix C for definitions of these terms). These themes align with the search parameters of this study around student-centred and active learning and inform the recommendations for this paper. Each of these meta studies are briefly described, then unpacked, into the key themes below.

Kilburn et al (2014) conducted a literature review of over 800 articles to ‘garner insights into how methods teaching was conceived of, enacted, and reflected upon by practitioners’ (p.197). To establish the library of 800 references they searched for all peer-reviewed outputs on the teaching and learning of social research methods, then refined the library to identify 24 papers that addressed the teaching of research methods specifically and in detail. The authors conducted a thematic analysis of the papers and derived a set of common, interrelated themes:

Theme 1: Make research visible—connect learners to research (active learning);
Theme 2: Learn by doing—immerse students in actual research (authentic learning);
Theme 3: Reflect on the research process—encourage students and educators to reflect upon the research process to enable them to position themselves in the bigger picture (reflexive learning); and
Theme 4: Pedagogic culture – encourage discourse and debate between academics through local sharing of successes and challenges around teaching research methods (explained later in this paper).

Lewthwaite et al (2016) drew upon these four themes to map to the findings of their own study, where they examined the teaching of research methods through an expert dialogic method. They conducted interviews and discussions with international pedagogy and research experts (Table 2) from multiple disciplines and across a variety of research methodologies.
In using a dialogic panel method, the primary goal of Lewthwaite et al (2016) was to draw from the experiences of experts in both pedagogy and research to see how these themes are realised in pedagogical practice, rather than attempting to reach a consensus around broad areas of research. The panel of experts interviewed in this study shared ideas and suggestions about the types of pedagogical activities academics could use to engage students with active, authentic, and reflexive learning, as shown in Appendix C.

Earley (2014) synthesised 89 studies with a focus on the characteristics of students taking a research methods course (see Table 2), exploring teaching methods and techniques as well as content and course goals. In response to the learner challenges, and the need for ‘pedagogic culture’, Earley (2014) contends that the ‘benefits of discussing who we teach, how we teach and assess, and what content we teach in these courses has far-reaching consequences for improving the educational experience’ (p.249).

The findings, and authors insights, from these meta studies are interwoven into the themes below.

**Themes and Recommendations from the Meta-Studies**

1. *Make research visible (active learning)*

For Kilburn et al (2014), making research visible is about using active, student-centred learning to ground students in abstract principles of research methods. Active learning is broadly defined as any teaching method which gets students actively involved as opposed to transmissive modes of teaching through lecture (Keyser, 2000 cited in Kilburn (2014).

Through their interviews with expert teachers of research methods, Lewthwaite et al (2016) interpret this theme as ‘pedagogic starting points or hooks’ to connect learners to research. As one expert expressed: ‘If you get people engaged at undergraduate level, you’ve potentially hooked them for life’ (Andy Field, Table 2). Pedagogical hooks are non-threatening, non-technical, and even enjoyable. Lewthwaite et al (2016) suggest, however, that to effectively engage students and meet their needs, teachers must ensure that
learning outcomes account for disciplinary legacies and methods cultures across various countries and fields of research.

Active learning may take the form of simple to complex strategies ranging from in-class discussions to structured pedagogies such as case-based learning, problem-based learning, cooperative learning, experiential and service-learning (Early, 2014) as a means to increase student engagement with content (see Appendix D). At the higher end of active learning, students may act as partners in research, even to the extent that they ‘have extensive autonomy and independence and negotiate as partners many of the details of the research and inquiry projects that they undertake’ (Healey et al., 2014, p.8).

2. Learn by doing (authentic learning)
Kilburn et al (2014) proposed the approach of placing a real research experience at the centre of students’ learning; an emphasis on authenticity can be achieved by designing courses around ‘an array of research endeavours and practical experiences similar to those they might encounter in real research projects’ (DeLyser et al., 2012, p. 20 cited in Kilburn et al, 2014). This could involve undertaking research in real-world contexts or using authentic, empirical data.

Similarly, Lewthwaite et al (2016), in their analysis of expert opinions, indicate that ‘hands-on’ learning is essential to achieve student motivation, development of skills and expertise, and an understanding of ethical practice. They also refer to a sense of satisfaction for students as they take ownership of a project or have an ‘end product’. Experts commonly referred to explicit pedagogical approaches such as ‘learning by doing’ and/or ‘experiential learning’. For all experts, student learning with and through data use was fundamental to their teaching practice. The emphasis on experiential learning went beyond qualitative approaches into quantitative, mixed methods, skills–based, and procedural methods—the authors spoke of teaching through an ‘immersive and authentic landscape of experiential real-world research’ (p.421). Experts from the dialogic panel described learning by doing as an essential ‘pedagogical root’, and stated it was ‘critical’ for learning certain aspects of research practice. Lewthwaite et al (2016) report that experts in their study expressed the necessity of gathering and generating data, handling analysis, and reporting ‘real’ data.

3. Reflect on the research process (reflexive learning)
Reflexive (or reflective) practice on research is seen as imperative not just for the student but for the educator as well. In terms of the learner, reflexive practice may involve reflecting critically upon his/her research practice, on the methods they are being taught, and on the socio-cultural context within which learning is taking place (Kilburn et al, 2014). For the educator, the reflexivity of teacher-as-learner may be realised when they have doctoral students who possess ‘extraordinary expertise’ in a particular research method (Lewthwaite and Nind, 2016). This also ventures into students-as-partners territory where Kilburn et al (2014) cite an example where a teacher co-authored an article on the teaching and learning of research methods in a major peer-reviewed journal with nine of her students. Lewthwaite et al (2016) cite expert Chilisia’s view (Table 2) that students need to be made aware that, whenever they do research, they are doing research from a standpoint and need to be clear
about their standpoints. Other experts stated that approaches that promoted reflection were deployed strongly in qualitative and mixed methods, but also formed a significant component of teaching quantitative research methods (Porter, Vogt, Wild in Table 2).

Kilburn et al. (2014) describes reflexive practice as having the following benefits for students and teachers:

- Provides teachers with rare insights into students’ (pre) conceptions, anxieties or motivations as novice researchers;
- Promotes deeper knowledge of method expertise in learners;
- Encourages students to have a standpoint about their research so they can locate and situate their decision within a wider methods landscape;
- Exposes the methods of research within a given context;
- Exposes the ‘back story’ of the research process and its iterative nature;
- Orientates teaching to the learner’s particular context (expertise, discipline, background, nationality, standpoints)

Each of the above themes are supported by pedagogical practices suggested by the authors and synthesised in Appendix D. These also form the key recommendations for this paper as a starting point to consider ways to approach the teaching of research methods. The next section will provide a closer look at a sample of studies that educators may find useful in terms of curriculum and assessment design.

**Recommendations for teaching research methods and practices:**
1. Make research visible: connect learners to research through active learning
2. Allow students to learn by doing: make research learning authentic learning by immersing students in actual research
3. Encourage reflexive learning about the research process: encouraging students and educators to reflect upon the research process to enable them to position themselves in the bigger picture
Example studies

Examples studies were sought to provide a more pragmatic view of how educators applied active and student centred learning techniques to address some of the challenges, or enhance, their teaching of research methods. These studies were also selected if it were evident that students undertook research activities and there was clear improvement to student engagement. This was reinforced by the emphasis on active, authentic and reflexive learning themes that arose in the ‘meta’ studies led by Kilburn et al. (2014). To provide a closer view, the following case studies indicate approaches to curriculum and assessment design for teaching research methods across disciplines and year levels. These studies may be useful for educators to consider in terms of the reasons for changes to course design and the steps taken to improve student engagement.

The examples in the next section can also be considered alongside pedagogical strategies and ideas for teaching research methods outlined in Appendix D.

Note: For further examples beyond this study, see a recent publication by Fung (2017), A Connected Curriculum for Higher Education, highlighting practices for engaging students in research through an integrated curriculum. In Chapter 4, Fung (2017) recommends approaches to embedding research into curriculum illustrated with vignettes from practice.
Example 1: Does Active Learning Improve Students’ Knowledge of and Attitudes Toward Research Methods? (Campisi & Finn, 2011)

Context: First year Sports Medicine major
Active learning approach: Collaborative learning
Teaching problem: Students’ reluctance to enroll in a research methods course due to lack of interest
Proposed change: Stimulate undergraduate student interest through active and collaborative learning through the redesign of a course to include participation in a research project.
Outcomes: The majority (>50%) of students felt that they made good/great gains in content knowledge, skill acquisition, and overall confidence and comfort for major concepts in the research methods course.
Course design: This course was previously taught in a lecture format where the students read peer-reviewed journals to understand the major concepts of research methodology. The active, collaborative learning project was created to help students work in a team and become more familiar with the research methodology typically used in sports medicine. The project required active participation in a research project conducted throughout the academic semester and involved continual feedback from the instructors. Students were randomly assigned to a group of three or four and were introduced to the research project orally in class and through written handouts during the first-class meeting. Student groups initially chose a topic from an instructor-generated list of feasible research ideas. Figure 1 shows the structure of the course.

![Flow diagram of course procedures.](image)

Students were also expected to reflect on their experiences through:
- A survey addressing their attitudes and perceptions related to research methodology (pre- and post-semester)
- Bi-weekly Blackboard discussions to reflect on the research topics and assignments of the week and experiences throughout the project.
Example 2: Teaching Research Method Using a Student-Centred Approach (Barraket, 2005)

**Context:** Masters-level Social Research Methods

**Active learning approaches:** Case-study teaching, problem-based learning, group work, role-play and simulation

**Teaching problem:** Dual challenges of teaching effectively with experientially-diverse student groups and making the research methods curriculum interesting and relevant to these groups. The authors felt it was a high priority to develop a common experiential ground and supportive social context in light of current higher education contexts where flexible learning pathways are producing ‘diverse student cohorts with no, or highly limited, common learning experiences’ (p.67).

**Proposed change:** Build experiential common ground and shift toward a more student-centred approach to enhance students’ experiential understanding of the complexities and creativity of conducting effective research in political environments.

**Outcomes:** The shift towards student-centredness significantly enhanced students’ learning through the use of interactive small group activities and a high level of discussion and interaction. Students indicated that they still valued this style of teaching integrated with the lecture format. This example highlights the challenges in teaching research methods to a diverse cohort of students.

**Course design:** Small group activities included icebreakers, scenario exercises, role-plays, and critical reflections to foster high levels of dialogue. Authentic learning was fostered by including guest lectures and focusing the curriculum on current affairs. The following table shows the shift in course design between 2003 and 2004.

<table>
<thead>
<tr>
<th>Subject Topic</th>
<th>2003 Class Design</th>
<th>2004 Class Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Ice-breaker, subject overview and preliminary presentation</td>
<td>Ice-breaker, subject overview and preliminary class discussion</td>
</tr>
<tr>
<td>Philosophy of Social Research</td>
<td>Lecturer presentation followed by scenario exercises</td>
<td>Scenario exercises followed by lecturer presentation</td>
</tr>
<tr>
<td>Ethics</td>
<td>General discussion and lecturer presentation</td>
<td>4-way case study followed by lecturer presentation</td>
</tr>
<tr>
<td>Principles of Effective Research Design</td>
<td>Lecturer presentation and small-group discussion</td>
<td>Individual exercise, large-group discussion, small-group exercise and lecturer presentation</td>
</tr>
<tr>
<td>Sampling Methods</td>
<td>Lecturer presentation and general discussion</td>
<td>Small-group scenario exercise, large-group discussion, lecturer presentation</td>
</tr>
<tr>
<td>Designing Research Instruments</td>
<td>Group analysis of existing instruments (examples of good practice and bad practice), lecturer presentation</td>
<td>Group participation in formative evaluation of the subject, group reflection on the survey instrument, lecturer presentation</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>Computer workshop and lecturer presentation</td>
<td>Guest lecturer, small-group scenario exercise, small-group critical reading exercise and class discussion</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Lecturer presentation and general discussion</td>
<td>Small-group scenario exercise, and lecturer presentation</td>
</tr>
<tr>
<td>Politics in Research</td>
<td>Not covered</td>
<td>Role plays drawing on two scenarios drawn from current public affairs</td>
</tr>
</tbody>
</table>
Example 3: Learning and Teaching Research Methods in Management Education
Development of a Curriculum to Combine Theory and Practice—A Swiss Case.

(Hoidn & Olbert-Bock, 2016)

**Context:** Master of Business

**Active learning approaches:** Learner-centred design; hands-on research, group work, and reflective skills

**Teaching problem:** Dual challenges of teaching effectively with experientially diverse student groups, and making the research methods curriculum interesting and relevant to these groups.

**Proposed change:** Pluralism in research knowledge, holistic approach to teaching

**Outcomes:** Led to gains in research methods knowledge and skills and improvements in research-related social and reflexive competencies.

**Course design:** This research curriculum is designed to foster research-related management knowledge and skills, for example, research, social, learning and reflective knowledge skills. It is informed by Biggs’ (1999) notion of constructive alignment (aligning course learning outcomes, activities and assessment) and Wiggins and McTighe’s (1998) Backwards Design model that starts with the end in mind—focusing on the knowledge, skills and abilities desired of the students at the end of the course. In Module 1 the educators established common experiential ground and deepened their interest in and understanding of scientific work and research methods. In Modules 1 and 2, the major strengths of the curriculum were:

- The opportunity to conduct research tackling real management problems increased students’ involvement and motivation;
- The introduction to quantitative and qualitative approaches, the balance of theoretical knowledge acquisition and its practical application throughout the programme;
- Hands-on experience of conducting real research projects from start to finish over one year; and
- Diverse individual and group learning activities aligned with a portfolio of formative and summative assessment tasks and feedback.

Hoidn and Olbert-Bock (2014) recommend that educators need both pedagogical expertise as well as an aptitude for teaching research methodology— with expertise in both qualitative and quantitative research approaches. Students need to be introduced to authentic academic and work-based research practices so they can become full participants in a community of practice. They need guidance on both research and group processes to support their collaborative work, productive learning experiences as well as help to ensure groups can operate efficiently.

Educators also need to:

- Structure the learning content and lay the groundwork;
- Provide learning resources;
- Set clear expectations; and
- Develop an agenda with deadlines for projects, paying close attention to provisional research outcomes.
The examples above show how educator-researchers sought to change their teaching practice in response to the problems they faced in their teaching practice—and how active and student centred activities led to improved student engagement. The next section covers the fourth theme that emerged— ‘pedagogic culture’ and refers to the types of support (e.g collegial, institutional, academic) that educators may need to change or enhance their practice of teaching research methods.

Developing a Pedagogic Culture Around Teaching Research Methods

Pedagogic culture was the fourth theme to emerge from the meta studies. This theme focusses on the nurturing of a culture around the teaching (and study of teaching) of research methods. Such a culture is characterised by ‘the exchange of ideas within a climate of systematic debate, investigation and evaluation’ (Wagner et al., 2011, p. 75). Researchers see the need for cross-citations in literature and dialogue between disciplinary and methodological contexts to move the teaching of research methods from practitioner’s reflections to empirical research and into a more substantial research base. This is needed to help support educators who Earley (2014) states are largely left to rely on ‘a network of peers, scattered research literature, and much trial-and error for developing their practice’ (p. 243). Pfeiffer and Roglin (2012) believe that having open and honest dialogue around the challenges, struggles and failures that educators experience in conducting their own research ‘generates a reciprocal learning environment that is enriching for both students and faculty members’. (p.368). Open dialogue can be achieved through various other means such as the development of communities of practice and institutional initiatives that open opportunities to share challenges and successes in teaching research methods. Appendix E is a Needs Analysis Framework that may assist educators conceptualise the challenges and successes arising from teaching research methods and form the basis of strategies to address common issues at individual, school or faculty level.

Conclusion

This paper provides an overview of the challenges of teaching and learning research methods in higher education, and the variety of ways in which educator-researchers have addressed them. The themes that emerge serve as recommendations for approaches to teaching research methods and are accompanied by examples which educators may find useful for adapting to their own practice. There is no single formula for teaching research methods given its dependence upon teaching and learning contexts. However, it is clear from the literature, that experts in research and pedagogy see a need for students at all levels to be immersed as much as possible in research practice and that active and authentic learning lend itself to this. Students need opportunities to develop a standpoint of where they see themselves in the wider landscape of research to empower them to think and act like researchers. Nurturing a pedagogic culture to support educators in teaching research methods is also seen as critical. Of further note is Fung’s (2017) recent study which provides a holistic view of embedding research and teaching culture through a connected curriculum at institutional level. That is, one that connects students to research, to a research culture, to society and to the opportunities and challenges of the 21st Century.
References


APPENDICES

APPENDIX A: Teaching Research Methods Bibliography

APPENDIX B: Teaching Research Methods Analysis Table

APPENDIX C: Defining Active, Authentic and Reflexive Learning

APPENDIX D: Strategies for Active, Authentic and Reflective Learning

APPENDIX E: Teaching Research Methods Needs Analysis Framework
APPENDIX A: Teaching Research Methods Bibliography

The following articles were selected for further review for the Research Methods Paper after they met key criteria of: (i) evidence of improvement to student engagement; (ii) students actively engaging in research; and (iii) teaching approaches that involved student-centred learning or active learning.


APPENDIX B: Teaching Research Methods Analysis Table

The following table outlines all of the articles where the authors indicated evidence of improvement to student engagement as a result in changes to teaching practice. The table provides further demographic information such as discipline, institution, country, year level, delivery mode, course design and the type of research activity that engaged with.
<table>
<thead>
<tr>
<th>Discipline</th>
<th>Author</th>
<th>Institution</th>
<th>Level</th>
<th>Delivery</th>
<th>Teaching Approach</th>
<th>Course Design</th>
<th>Student Research</th>
<th>Improved Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>Bell, R. (2016)</td>
<td>Worcester Bus.</td>
<td>Undergraduate</td>
<td>Post graduate</td>
<td>Face to face</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Business</td>
<td>Braguglia, K. H. J. (2012)</td>
<td>Metropolitan U</td>
<td>Undergraduate</td>
<td>X</td>
<td>X1</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Business</td>
<td>Johnson, K. (2013)</td>
<td>Marmara U</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Business</td>
<td>Hoidn, S. et al. (2016)</td>
<td>U of Applied Sc</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Education</td>
<td>Özden, B. (2016)</td>
<td>U of Hawaii</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Education</td>
<td>Hoffman, E. S. (2014)</td>
<td>James Madison</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Education</td>
<td>Earley, M. (2016)</td>
<td>Bowling Green</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>Peachey, A. A. et al. (2015)</td>
<td>James Madison</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>Ewing, H. et al. (2012)</td>
<td>A.T. Still U</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>Ekmekci, O. et al. (2012)</td>
<td>G. Washington</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Medicine</td>
<td>Rosenkranz, S. et al. (2015)</td>
<td>UWS</td>
<td>Undergraduate</td>
<td>X</td>
<td>3</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Medicine</td>
<td>Campisi, J. F., K.E. (2011)</td>
<td>X4</td>
<td>Undergraduate</td>
<td>X</td>
<td>3</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Psychology</td>
<td>Pliske, R. M. et al. (2015)</td>
<td>X5</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Psychology</td>
<td>Hardway, C. L. et al. (2014)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Psychology</td>
<td>Ciarocco, N. J. et al. (2013)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Psychology</td>
<td>Baglin, J. et al. (2015)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Social Work</td>
<td>Blakemore, T. et al. (2015)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Social Work</td>
<td>Shannon, P. et al. (2012)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
<tr>
<td>Social Work</td>
<td>Natland, S. et al. (2016)</td>
<td>X</td>
<td>Undergraduate</td>
<td>X</td>
<td>X</td>
<td>Online</td>
<td>Constructivist</td>
<td>Active</td>
</tr>
</tbody>
</table>

X1 – Two week intensive before semester; X2 – Empirical; X3 – In 4th year; X4 – In 1st year; X5 – 2nd year
SE - Self-Efficacy Learning; TB - Team Based Learning; SC – Social Constructivism; A – Authentic; V – virtual; W - WIL strengthened; SL – Service Learning;
<table>
<thead>
<tr>
<th>Discipline</th>
<th>Author</th>
<th>Institution</th>
<th>Level</th>
<th>Delivery</th>
<th>Teaching Approach</th>
<th>Course Design</th>
<th>Student Research</th>
<th>Improved Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work</td>
<td>Elliott, W. et al. (2013)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Political Science</td>
<td>Barraket, J. (2005)</td>
<td>U Melbourne</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Political Science</td>
<td>Clark, A. (2011)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Geography</td>
<td>Keenan, K. et al. (2012)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Information Sc</td>
<td>Albright, K (2012)</td>
<td>U of Sheffield</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

X6 - student-centred instructional methods including discussion, group work, role-playing, experiential learning, problem based learning and case-method teaching;

GT – Grounded Theory; SD – Self-Directed Inquiry
APPENDIX C: Defining Active, Authentic and Reflexive Learning

Active Learning

Active learning is broadly defined as ‘any teaching method that gets students actively involved’ (Keyser, 2000, p. 35). Barr and Tagg (1995) assert that students must be ‘active discoverers and constructors of their own knowledge’ (p.21). This is in contrast to teaching approaches where students are essentially passive recipients of knowledge. Active learning approaches are designed to promote opportunities for students to delve more deeply into content, with regular opportunities for feedback and reflection. While active learning can be delivered through individual activities, it is common to leverage the combined knowledge of a group so students can share, collaborate and synthesise their knowledge based on challenging and interesting problems. Active learning activities can range from in-class discussions, interactive lectures, debates, and think-pair-share exercises to more intricately-designed group activities such as scenario-based learning, problem-based learning, peer instruction and case-based learning. These activities take longer to design initially, but are useful tools that can be structured to address key concepts and known challenges to guide learning. Implementing in-class activities can also take up time; to allow for this time, key content can be made available online for students before they get together to work in groups.

Authentic Learning

Proponents of authentic learning emphasise the need for educators to draw upon and connect students to real-world, complex problems and their solutions (Lombardi, 2007). Authentic teaching and learning activities are designed to bridge the gap between novice and practitioner so that students can envisage themselves as professionals working in complex environments. Lombardi (2007) illustrates this with a reference to developmental psychologist, Jerome Bruner, stating there is a difference between learning about physics and learning to be a physicist. Authentic learning environments are designed to scaffold students’ learning to develop ‘portable skills’ towards functional disciplinary expertise. Authentic learning helps students develop the skills to evaluate and synthesise knowledge and apply that knowledge to a range of contexts. Reeves et al. (2002) distil ten design elements for authentic learning:

1. Real-world relevance
2. Ill-defined problem
3. Sustained investigation
4. Multiple sources and perspectives
5. Collaboration
6. Reflection (metacognition)
7. Interdisciplinary perspective
8. Integrated assessment
9. Polished products
10. Multiple interpretations and outcomes
Reflexive (or reflective) Learning

Reflexive or reflective learning develops the ability for students to reflect on their actions to engage in a process of continuous learning (Schon, 1983). Understanding how we learn is as important as understanding what we learn (Race, 2010). Students can struggle with this writing genre so it is best to provide examples, rubrics and/or guiding statements to help get them started:

‘I did it this way because...'
‘I felt this way at the time because...'
‘I struggled with the concept of...'
‘I enjoyed reviewing this because...'

Reflective writing pieces can include aspects of student’s emotional, cognitive, or skills development throughout their learning journey. Some academic reflective writing requires students to back up their thoughts with references to appropriate literature where they relate theory and expert practice to their personal learning. Educators can then use student’s reflective pieces to extract common misconceptions or provide positive feedback to guide individual and whole-group learning.

References


### APPENDIX D: Strategies for Active, Authentic and Reflective Learning (for TRM)

(Kilburn et al. (2014), Lethwaite & Nind (2016) and references therein)

<table>
<thead>
<tr>
<th>Theme 1: Make research visible (active learning)</th>
<th>Theme 2: Immerse students in actual research (authentic learning)</th>
<th>Theme 3: Reflective Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewthaite and Nind (2016) recommend the following to make research active:</td>
<td>Lewthaite and Nind (2016) recommend ‘hands-on’ learning of research methods as an essential driver of (i) student motivation, (ii) development of skills and expertise, and (iii) understanding of ethical practice.</td>
<td>Lethwaite and Nind (2016), who used the ‘expert dialogic panel’ to develop their ideas, indicate that reflexive language and pedagogic approaches were frequently embedded in expert teaching practices. Their summary of the key points from the panel discussion suggests that learners can situate themselves in research through:</td>
</tr>
<tr>
<td>• Use pedagogic hooks to get students actively involved in learning (examples include hands-on work with analytic software, engaging students through the use of interesting data sets, or posing ethical questions to which students can relate.)</td>
<td>Kilburn et al (2014) also state that ‘first-hand experience of undertaking research in real-world contexts or using authentic empirical data’ is crucial to student learning (p. 199). They suggest the following strategies:</td>
<td>• attention to critical standpoints (contribution by Hesser-Biber);</td>
</tr>
<tr>
<td>• Understand the students’ current levels of skill, research experiences can be incorporated into a spiral curriculum to scaffold learners explorations of into research activities.</td>
<td>For Engaging with Qualitative Research</td>
<td>• critical engagement in peer groups (contribution from Coffey);</td>
</tr>
<tr>
<td>• Use learner’s interests and culture to build bridges into the research space (e.g. use their disciplinary culture or literature familiar to them).</td>
<td>• Students conduct interviews, transcribe and code them.</td>
<td>• promoting the evaluation and adoption of multiple perspectives (contributions from Coffey and Creswell); and</td>
</tr>
<tr>
<td>• Use active learning pedagogies such as cooperative learning and service learning (e.g community work) can to help students engage with a research question and the associated data collection and analysis.</td>
<td>• Students complete analysis and reporting of the data as part of their written assessment.</td>
<td>• engaging understandings of paradigms and critique (contribution from Chilisa).</td>
</tr>
<tr>
<td>• Combine problem-based approaches from educator’s own research to engage students – in particular, students can pose their ideas for a solution (this approach is termed the ‘advanced apprentice model’).</td>
<td>For Engaging with Quantitative Research</td>
<td>(Kilburn et al, 2014) suggest the following strategies for reflective learning.</td>
</tr>
<tr>
<td>• Foster student’s appreciation or understanding of what might count as data or evidence (i.e. research questions don’t exist in a vacuum;)</td>
<td>• Students design and administer surveys to illustrate the ‘challenges of operationalisation’ associated with political science research (Aguado, 2009, p. 256).</td>
<td>• Students reflect upon their own attitudes and experiences of learning and/or conducting research.</td>
</tr>
<tr>
<td></td>
<td>• Students conduct analyses of relevant data from existing social surveys to situate the learning of quantitative methods within contemporary examples that are relevant to students’ disciplines (Adeney and Carey, 2009). (Note: data must be cleaned and coded for the novice.)</td>
<td>• Students adopt a reflective stance towards their own conduct as researchers, especially when exploring ethnographic or narrative methods.</td>
</tr>
</tbody>
</table>
they are located in research spaces).

- Provide students with opportunities to practice the research process so they can make mistakes and learn from them.

Kilburn et al (2014) recommend various activities and multimedia for teaching qualitative analysis:

- Use ‘real’ research data (collected from individuals as part of a research project)
- Use existing media (scenes from feature films to demonstrate epistemological, methodological and procedural aspects of qualitative research that would otherwise have relied on didactic instruction (Saldaña, 2009)

Examples of multimedia include:

- Mythbusters documentary series to illustrate principles of research inquiry (Burkley and Burkley, 2009)
- Audio podcasts, in the form of recorded interviews in which academics discussed their own methodological approaches (these formed the basis of critical evaluation assignments undertaken by students (Ryan et al., 2014).
- Discussion forum hosted on a virtual learning environment which elicited 227 student comments on the topic of devising research questions (Leston-Bandeira, 2013);
- Web-based tutorials and collaborative wikis
- Online discussions or problem-solving activities (Schulze, 2009).

- Students undertake an independent research project, individually or in a group, culminating in a report of the research. (Note: apprenticeship-type models are preferred, where students work alongside the academic or under the academic’s supervision).
- Students have opportunities to receive feedback from experts and share their findings with the research teams and with community groups.
- Students undertake innovative forms of assessment where undergraduates choose their own research questions, deduce their own hypotheses and choose which data sets to work on (under supervision).
- Students engage in self-reflexive writing on aspects of the research process; the challenges or difficulties they encountered, how these differed from prior expectations, how the task could have been done differently, and how the conduct of the research might impact on the analysis or writing up.
- Students deploy particular ways of thinking, such as considering situations from alternative standpoints by examining the use of language, the symbolism of non-verbal communication, or the role of action, interaction and embodiment in the research process (memos, diaries, field notes).
- Students think innovatively to use existing interview data to explore how positionality, tension and sensitivity play out in the research of others (Hsiung, 2008, referenced in Kilburn et al, 2014).
- Students engage in group discussion for airing underlying assumptions, sharing experiences or critically appraising research practice(s) (Cox, 2012, referenced in Kilburn et al, 2014).

* Teaching Research Methods (TRM)
APPENDIX E: Teaching Research Methods Needs Analysis Framework

This needs analysis framework is based upon the findings of researchers (Lewthwaite & Nind, 2016; Kilburn et al., 2014; Earley, 2014) investigating effective practice to teach research methods. This framework can be used as a diagnostic tool for educators at individual, school, or faculty level to identify successful strategies and areas of teaching that need further support.

Teaching context

School/ faculty:

What course do you teach?

What year level? Undergraduate/ postgraduate?

What type of research methods do you teach? (Qualitative/ Quantitative/ Mixed methods)

Do you teach a whole course in research methods or is it integrated into your current course?

How do you teach research methods? 
(Lecture/ tutorial, workshops, seminars, laboratory, fieldwork)

What aspects of your teaching do you find most useful for students?

What challenges (if any) do you face in teaching research methods?

What challenges (if any) do your learners face in learning research methods?

How do you deal with students with different learning needs? (e.g., different disciplines, gaps in knowledge of research methods, various strengths and weaknesses)

What changes (if any) would you like to make to your teaching?

What support would you find useful to help you enhance or improve your teaching of research methods?

Active learning

Do you use active learning strategies in your course? (e.g., group or class discussions, interactive lecture; problem-based learning; collaborative activities; team-based learning; cooperative learning; service learning, work-integrated learning, peer instruction, think-pair-share)

Do you use pedagogical hooks to help engage your students? (e.g., bringing examples from the outside from films, television, or literature); analogies, metaphors or narratives; inviting experts; using simulation, problem-based learning)
**Authentic learning**

Authentic learning has similar aspects to active learning. Here ‘authentic learning’ refers to activities where students get to engage in research activities.

Do students actively engage in research activities? If so what do they do?

At which point in your course (if any) do students practice research?

Do students have opportunities to choose their own research questions?

Do you draw upon the student’s experiences and knowledge in the design of activities?

Do you bring your own research to the classroom? If so, how? (e.g., research problems, data sets from your own research that students can engage with)

Do you draw upon experts in the field to model good practice?

Do students have the opportunity to publish or co-publish with you?

**Reflexive (or reflective) learning**

Reflexive (or reflective) learning is cited by experts as critical for students to be able to position themselves in the wider landscape of research, question their decisions, and develop a standpoint.

Do your students have opportunities to reflect upon the research process?

Do your students have opportunities to share, critique, or discuss their assumptions, standpoints and/ or knowledge of research methods with peers (e.g., through discussion or debate)?

Do you consider the learner’s contexts (e.g., expertise, discipline, background, nationality, standpoints) when designing activities?

**Pedagogic culture**

Are there opportunities for you to reflect upon, discuss, and share knowledge with colleagues on teaching research methods?

What sort of collegial activities would assist you to improve or enhance your teaching of research? (e.g., online or face-to-face community of practice, forums, seminars).