Learning about Research by Doing Research: Developing Student Researchers

By Ashley Compton, Emma Rogers, Christopher Johnstone and Dan Wait

A perspective piece

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Abstract

In this article senior lecturers and second year students from the BA (Hons) Primary Education programme at Bishop Grosseteste University, who were involved in an educational research project, reflect on the importance of teacher led research and the impact on students of leading their own research projects. Teachers' involvement with knowledge creation is widely recognised as an effective form of professional development (Hopkins, 2014; Taber, 2013). There has also been an increasingly prevalent binary view of Initial Teacher Education in which the real practical learning goes on in school placements whilst more theoretical learning goes on in universities (Czerniawski, 2018). However, student teacher research involving children should be seen as a consolidation of theory and practice. It is therefore essential that student teachers learn how to carry out research involving children, understand the ethical implications of this and recognise the value of reflecting on the effectiveness of pedagogical approaches. However, undertaking this kind of practitioner research can be daunting. Over the period of six weeks, the students were coached in research methods, data collection, analysis of data and drawing conclusions. Children from partnership schools visited the university to take part in the research tasks. This gave the students a valuable insight to key aspects of teaching and learning such as the children's reading preferences, the use of digital resources to teach science and using story to support mathematical understanding. Students' findings were presented in the form of research posters. Students found the project an interesting way to develop their understanding of research and reflected positively about what they had learnt about research methods.

Learning about Research by Doing Research: Developing Student Researchers

This paper explores learning about research by engaging in research. This involved a research project undertaken by Year 2 BA (Hons) Primary Education students at Bishop Grosseteste University and groups of visiting children from Lincolnshire primary schools. The learning process is discussed and the perspectives of two students involved in the project are given alongside the research posters they created as assessed pieces. The paper aims to reflect on the usefulness of learning about research through conducting research and the opportunities and challenges afforded by collaborative research projects. The format of this paper is a perspective piece but in order to do this justice it seemed important to include the perspectives of both tutors and students. While it is common for tutors to write such pieces we felt that it would be more ethical to include direct student voice, rather than the tutors' interpretation of that voice. The module, while about research, was not intended as research on the students so there was no ethical clearance to interview the students for this paper. Instead, **i**n order to include a student perspective of the process, two students were asked to be co-authors to reflect on their experiences of the project and what they had learned from this. It should be noted that both of these students were very successful in this module and should not be assumed to be representative of the whole student group. In addition to their reflections on the process, both student co-authors agreed to include their assessed posters in the article as examples. These have been included at the end to give readers some insight into the type of projects that were conducted in the module, since that is beyond the scope of this paper, and the format of assessment. Education practice in England is heavily influenced by government policy and the 'top-down' implementation of practice where teachers are the consumers rather than the creators of research and innovation prevails (Robinson, 2003, 27). Therefore, professional learning tends towards the sharing of meta-reviews and commissioned reports rather than practitioner-led enquiry. Winch (2017, 183) emphasised the importance of Initial Teacher Education (ITE) students learning to 'develop an independent and critical perspective on empirical research', that includes recognition

of the complexities involved in educational research which limits certainty. He recommended that students should be introduced to a centrally approved body of research that had 'achieved good standards of probity in methodology, that has been repeatedly confirmed..., that has survived refutatory attempts and that has had some demonstrably efficacious effect on teaching and learning' (Winch, 2017, 184). While ITE does not currently have a centrally approved research curriculum, there have been moves to create repositories of approved research in education. In 2013 the What Works Network was established in the UK in order to have a more research informed approach to policy across a range of areas, including education, medicine, policing and social care, through systematic evaluations of existing research and commissioning new research (Gold et al, 2018, 9-10). The Education Endowment Foundation, within this What Works Network, has run 160 projects in 10,600 schools since its inception (EEF, 2018, 15) and engages with far more through its Teaching and Learning Toolkit which provides evidence summaries and rates the effectiveness of educational initiatives. In this climate it is important for teachers to understand how to read and critically evaluate research findings that are presented to them.

However, many educators believe that teachers themselves should be engaged in knowledge creation, pursuing a 'mastery of seeking' through which teachers learn about their learners through inquiry (Stenhouse, 1975, cited in Boyd, Hymer & Lockney, 2015, 104). Stenhouse is credited with beginning a teacher research movement (Hopkins, 2014, 42) which has continued into the 21st Century. An international study by BERA in 2014 concluded that high performing education systems had schools with 'research-rich' environments, where both teachers and teacher educators were involved with research. This partly means being aware of recent research in their subject but also involves engaging in forms of research themselves. This should start in initial teacher education but then be sustained throughout their careers (BERA, 2014, 6). Hopkins (2014, 45) claimed that 'Teacher research is not an end in itself, but is inextricably linked to curriculum change and the adoption of new teaching strategies. It is also at this point that teaching becomes a profession'. Taber (2013, 9) also linked being engaged and informed by research with teacher professionalism. He recommended that this begins during ITE, where the students can be supported by academics, library access and a programme that includes time to design, conduct and evaluate research. A 'teachers as researchers'

approach also attempts to break the binary approach to ITE, giving students the skills and knowledge required of a primary school practitioner through scholarship and research (Czerniawski, 2018).

Outline of Group Research Project

With this in mind the BA (Hons) Primary Education course at Bishop Grosseteste University endeavours to equip student teachers with the necessary skills to be practitioners who understand research-led teaching methods and engage in their own enquiries into teaching. It is an Initial Teacher Education programme that leads to recommendation for Qualified Teacher Status while students simultaneously complete an undergraduate degree. Since its first validation in 1994, the degree has recognised the importance of research in education and has involved students in conducting their own small-scale research. In the current validation, the Level 5 (Year 2) module *Beginning to Research* introduces the students to the processes of conducting research in order to prepare them for designing and conducting their individual research projects at Level 6 (Year 3).

In the Level 5 module the students learn how to undertake practitioner research, including developing their confidence in research ethics, common research methods and data analysis, working in small groups. Group work is recommended as an effective way of learning in Higher Education because it requires the students to take an active role in the learning process (Ashton & Stone, 2018; Ayers, 2015; Exley & Dennick, 2004). Learning at university is via a set of complex social experiences which is enhanced when all adult learners have supportive relationships and a sense of ownership over the learning process (Jogi, Karu & Krabi, 2015). Teaching through a range of contexts: lectures, seminars and small groups enabled students to develop a range of strategies to enhance peer learning (Ashwin, 2003) as well as developing a range of transferable skills, such as communication, negotiation and presentation skills (Ayres, 2015; Exley & Dennick, 2004). Group work fits into sociocultural learning theories and allows 'knowledge and understanding to be co-constructed and contested' (Ashton & Stone, 2018, 82). Matheison (2015) cited how Lave and Wenger's (1991) Communities of Practice and the Legitimate Peripheral Participation process, whereby novices work alongside experienced practitioners, can be used in Higher Education by including projects where students can engage with staff or more experienced students. In this module tutors worked alongside small groups of students to design, conduct and carry out small scale research

projects in Communities of Practice, thus providing a lived experience involving both participation and reification (Wenger, 1999).

Whilst the tutor selected the general research area and provided guidance, it was the students who worked together to devise the specific research questions and the methods with which to enquire. In 2018 / 19 the six research areas were: children's reading choices; Philosophy for Children; using apps to support children's enquiries; mapping stories; mathematics through story and reading for pleasure. Research questions were developed which would allow students to explore an existing phenomenon to gain a greater understanding, for example: In what ways does a child's understanding differ when using digital technology in comparison to text on paper formats? These questions are what Baumfield, Hall and Wall (2013, 38) would term the 'what's going on?' questions – seeking to understand rather than to intervene or act.

The students had to complete ethics forms which outlined their research questions, methods and ethical considerations. These had to be formally approved by tutors before the students were allowed to proceed with the research. Over two days children were brought to campus from local schools to participate in these research projects. Following the Bishop Grosseteste University (2017) ethics policy and the British Educational Research Association's (2018) research ethics guidance, permission was first obtained from their parents and head teachers. However, the children's permission was also sought, with the students explaining the research to the children, asking if they were willing to participate and explaining the right of withdrawal. Alternative activities were provided for any children who did not want to participate.

It was common for the students to use the first research day as a pilot, giving them the opportunity to refine their questions and methods before the second research day. Between the two research days, the students worked with their group tutor to evaluate the pilot study and analyse the data, ensuring that they were answering their research question. Trying, reflecting, evaluating and changing in this way aligns with Kolb's (2015) experiential learning cycle of concrete experience, reflective observation, abstract conceptualisation and active experimentation. The students had the concrete experience through conducting research with the children, reflected on the experience, drew conclusions to learn from it, and were given an opportunity for active experimentation in the second research day. The cycle was then partially

repeated with further reflection supported by group members and tutors and abstract conceptualisation through the completion of an assignment. Further active experimentation will occur in Year three when students conduct individual research projects. Potential limitations of Kolb's model were recognised: the learner in isolation reflecting on the experience from a personal perspective without considering the wider sociocultural context and the learner drawing experiences from within an institution without recognising that each institution will have their own way of conceptualising the experience (Philpott and Menter, 2017, 7). Therefore, by taking a collective approach to working, with a tutor to guide students to think about the wider sociocultural context, we can attempt to counter any potential limitation caused by isolation. The second limitation however is harder to avoid since the project takes place within a particular learning community working towards shared aims and underpinned by shared values. However, students were encouraged to consider their own positionality, as well as those of the institution and staff.

Assessment

Despite the collective nature of the research project, the assessment for this module was individual and consisted of a 2000-word critique of the methods they had selected and a poster of their findings. The first part was designed to prepare the students for writing the methodology section of their individual research project at Level 6. Prior to the introduction of this module the students at Level 6 often found the methodology section problematic and lacked confidence when justifying and evaluating their research methods. Bloxham (2015) recommended assessments which provide feedback to inform future learning and assignments. In this way, feedback received from this assignment will 'feedforward' (HEA, 2012) to their assignment in Year 3. The group sessions on designing research, evaluating research methods and analysing data ensured that the students discussed these issues with each other and the group tutor with respect to the specific project, giving valuable formative feedback (Bloxham, 2015, 114). Enabling the students to consider their methods, evaluate their research tasks and recognise the limitations of their study is valuable preparation for their future as Newly Qualified Teachers (NQTs) and beyond. As researching practitioners in busy classrooms they must be able to make prudent and pragmatic decisions about how and when to go about a small-scale research project. Marking the assignments showed that the majority of students were able to justify and evaluate their methods effectively. However,

markers noted that there was considerable variation in discussions of validity and reliability. Some students had a good understanding of these issues and were able to communicate this well. However, other students used the terminology with limited understanding, particularly when they tried to discuss specific types of validity, such as internal and construct validity. This indicates that more needs to be done to develop students' understanding and collective use of the language of inquiry. As well as becoming more fluent in the language of inquiry, students also practised skills in collaborative working as part of their Community of Practice. They developed new ways of looking, comparing their observations of children with the observations of their peers and recognising the limits of their own knowledge and how this influences their analysis and interpretations.

Students were asked to share their findings through summarising them onto a poster. Posters are commonly used to share research findings (Becker, 2014, 130; Crawley and Frazer, 2015, 830). Posters are a useful summative assessment tool because they encourage the student to explain their ideas concisely, reflecting, synthesising and analysing, while considering how to present the information for maximum impact on the audience (Crawley and Frazer, 2015, 832; Howard, 2015, 2). Summarising their findings in the small space afforded by a poster enabled the students to focus in on their most important discoveries and draw succinct implications of their study for their future classroom practice. Howard (2015) used posters to assess students in a module about learning to conduct research and found that the posters helped them consolidate their learning, although students found the module content and the poster format confusing initially. We had a similar experience with uncertainty about the poster format. In order to address this the students had the opportunity to study tutors' research posters as well as working with a design expert from Bishop Grosseteste University's Digital Learning team who taught the students the technical and aesthetic aspects of poster design. Students also had the opportunity to share their draft posters with one another for peer feedback while looking at the marking criteria (Bloxham, 2015). Although sharing work in progress carries a potential threat of conscious or unconscious plagiarism there was no evidence of this.

Student Perspective - Christopher

I believe that an awareness and good understanding of educational research will enable me to make better informed decisions regarding which teaching

approaches and classroom practices I should adopt in the classroom to best promote pupil progress. The experience of designing and conducting our own research during this module has demonstrated for me how complicated the research process can be, and how difficult it can be to ascertain what, if anything, research findings actually tell us. The module's focus on concepts such as validity, generalisability and reliability has certainly developed my abilities of critical analysis and evaluation. Having the children in for two days to take part in the research gave us the opportunity to pilot our research on the first visit, and make adjustments and refinements based on this for the second visit. The pilot day was particularly interesting, as the children did things and reacted in ways we had not anticipated or considered when designing our research and this allowed us to make significant improvements in our design and approach. Conducting the research for this module in groups and under tutor guidance was a positive and beneficial experience. The scaffolding offered by the tutor helped us navigate many pitfalls we may otherwise have succumbed to, and I feel working as a group meant we were able to get the best out of the children during the days they visited, in terms of interaction and participation. I initially found some of the content of this module difficult to grasp, but as it became clearer, it also became fascinating, and its relevance to practice clear. I look forward to conducting further research and will carry with me a strong sense of the importance of research in my future career as a teacher.

Student Perspective - Dan

Considering my future role as a teacher I believe it is crucial to be a good researcher; this is increasingly relevant within today's modern society as education is constantly evolving due to technological advances. New findings about primary schooling enable mainstream professionals to adapt and change the way they approach certain aspects of education. Having the children participate in our research was a great opportunity to put theory into practice. The presence of the children allowed us to thoroughly test and challenge the expected outcomes of our research. An advantage of doing this module in groups under tutor guidance was the flexibility to choose activities and research methods. However, a disadvantage was that some were creatively restricted due to the constraints of group work. The key thing learnt through this research module was the value of utilising varying research resources. This allowed us to develop a holistic understanding of research methods.

Conclusion

The module taught the students about designing and conducting their own research and helped develop their understanding of research methods and the complexities involved in the research process. Although it was acknowledged that some students found the subtleties of forms of validity more difficult, the focus on concepts of validity, generalisability and reliability helped to develop their overall understanding of critical analysis and evaluation. As Dan noted, navigating and negotiating group work can be challenging. However, the group project allowed the students to participate in a community of practice, participating with one another, taking an active role in their learning, sharing ideas and engaging in peer feedback, while working alongside tutors (Ayres, 2015; Exley and Dennick, 2004; Mathieson, 2015) to develop their identities as student teachers and student researchers. The project proved to be a valuable way to develop student understanding of small-scale research projects. It highlighted the importance of practitioner-led research in education and enabled the students to gain a shared insight into children's understanding and preferences which have clear implications on classroom practice. In a profession where agency is often removed from practice it is essential that Higher Education Institutions offer student teachers the opportunity for collaborative, volitional projects that look beyond what existing research can tell us and instead focus on what teachers can find out for themselves.

To what extent does the genre available foster reading for pleasure?

Dan Wait

Reading for pleasure and the genre available

There is clear evidence which demonstrates that reading for pleasure develops the imagination, improves attainment and supports personal, emotional and cultural development. (Cliff Hodges, 2010). Engaged readers tend to show positive attitudes towards reading, focused on finding, making and thinking about meaning. (Ross et al., 2006).

Such reading can involve any type of text or genre, for example; poetry, magazines, comics and fiction. (Cremin, 2014). Technological advances have meant individuals are reading for pleasure without even realising, whether this be acknowledging social media posts or reading an eBook. (Lindsay, 2010).

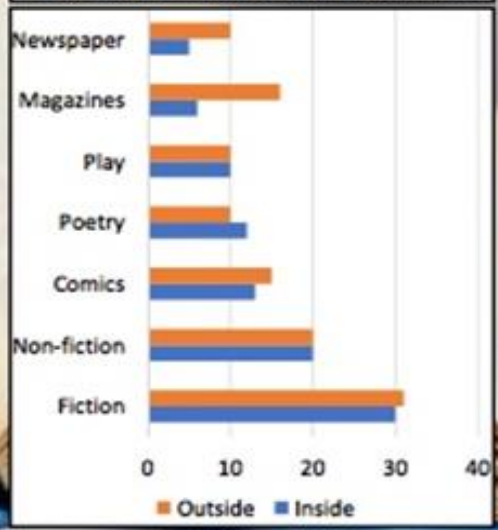
Ofsted (2004) published that reading for pleasure has declined by 15% in 5 years, this begs to question that the practice of relying upon extracts and downloads has limited pupils' knowledge, therefore influencing their book choice based on familiar genres within school. (King, 2002).

Research has shown that whilst there are teachers who read personally for pleasure, their knowledge of children's literature seems narrow, in particular their knowledge of poets. In comparison, children who were asked about their 'favourite childhood reading' would generally refer to a popular fiction such as; Dahl or Blyton, of which is commonly 'read aloud' during periods of reading comprehension in KS1. (Cremin et al., 2008). Thus, suggesting that teachers and pupils are being restricted by the National Curriculum's expectations on the type of genre and text pupils should be reading.

This investigation aims to explore and understand to what extent does the genre available foster reading for pleasure, as there is relatively little research that examines the nature of reader engagement and pleasure derived though reading. (Kucirkova et al., 2014).

Questionnaire, interview and observation data has been analysed from three different year groups in a local school to form conclusions and implications about this research project.

Genres read Inside vs Outside of school



Pupils' favourite genre to read

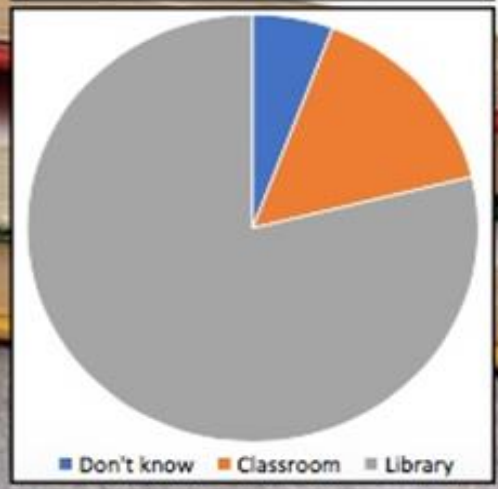
Key Findings

- 46% of pupils favourite genre to read is fiction.
- 38% of pupils read for 1-15 minutes per day compared to 13% that read for more than an hour.
- 86% of pupils claim that they do not have access to newspapers within school.
- When asked about the content of their book, 36% of pupils did not offer a in-depth response.
- 75% of pupils chose to change their book, 55% of them preferred the second book they had chosen.
- When asked 'Why did you chose that book?' Most respondents had seen the book in school, through the media or had a personal attachment e.g. non fiction books – dogs/horses/trucks
- Only 8% of pupils would choose to read play or newspaper texts outside of school.

Conclusions and Implications

- Throughout the investigation there were too many distractions such as iPads which were part of another groups' research project.
- The Hawthorne Effect was prevalent, this resulted in pupils giving answers that they believed we wanted to hear.
- Through observation, many pupils copied their peers' answers on the questionnaire and often wanted to read the same book that their friend was reading.
- The pilot study was disregarded due to leading questions and complex open questions, making it difficult to collect reliable and accurate results.
- How many times a child changed their book was recorded, however the amount of time they spent reading each book was not noted.
- Prior research should have been carried out to establish the pupils' interests and hobbies due to many respondents claiming that there was not a book available that they would normally read.

Where children think they can access books in school



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An Investigation into the Impact a Story Book About Shape has on Pupils' Perception of Shape in the Environment

- *Participants comprised 6 Y1, 10 Y4 & 12 Y5 pupils from a rural Lincolnshire primary school*
- *The Greedy Triangle (Burns & Silveria, 1994), a book about a triangle dissatisfied with its shape, was read to the children as part of the research process*
- *Each year group was divided into 2 sub-groups – one to take part in pre- & post-book shape finding tasks (using purposely designed photo collages), the other to take part in pre- & post-book semi-structured interviews about identifying shapes in both the immediate environment and the collages*
- *The resulting data was analysed for the number, types and range of shapes identified; language used to describe shapes; and general attitudes & opinions regarding the perception of shape in the environment*

Key findings from tasks

❖ Each year group identified a greater number of shapes post-book, but the overall range of shapes identified remained fairly constant

❖ Circles and squares were the most commonly seen shapes pre-book, whereas the identification of more complicated shapes, such as pentagons and hexagons, increased significantly post-book – suggesting pupils were now looking beyond the more obvious and simpler shapes

❖ The number of triangles identified saw the greatest increase – strongly implying the book had some impact, as its central character was a triangle

Key findings from interviews

"The book made no difference"

"It helped me to remember the names of tricky shapes like hexagon but it didn't help me to find the shapes"

"I don't remember the story"

❖ Interestingly, despite such utterances as those quoted above being quite typical, it was noted that pupils identified a greater number and wider range of shapes post-book, with increased enthusiasm and confidence

❖ Pupils, across year groups, reported that seeing shapes in the environment was easy but recalling the correct names for shapes was often difficult

❖ A common theme to emerge was that the book helped pupils to remember the correct names for shapes

Findings from previous research

❑ Maths-related picture books can engage children's interest, evoke mathematical thinking and increase pupils' understanding of mathematical concepts (Capraro & Capraro, 2006; Elia et al., 2010; Purpura et al., 2017; McAndrew et al., 2017; van den Heuval-Panhuizen & van den Boorgaard, 2008)

❑ Using children's literature in maths helps pupils make better connections between maths and everyday life (Furner, 2018; Hoinoski et al., 2016)

❑ Stories containing mathematical language can significantly increase pupils' maths vocabulary (Hassinger-Das et al., 2015)

❑ Teachers cite a lack of resources, time constraints and doubts regarding the benefits as key barriers to the incorporation of children's literature in maths lessons (Prendergast et al., 2018)

Conclusions & limitations of this study

❑ The findings from this study arguably suggest that the book had a positive impact on pupils' perception of shape in the environment, providing tentative evidence in support of previous research and the benefits of using literature in maths

❑ Responses stating that the book helped name shapes provide particular support to the findings of Haasinger-Das et al. (2015) and the positive effects books can have on maths vocabulary

❑ However, limited generalisability (due to the sample size); a potential lack of validity (practice or familiarity with the tasks could possibly account for any post-book improvements); and questionable reliability (interviewer bias and lack of neutrality cannot be ruled out) mean it would be wise to exercise caution in drawing any firm conclusions from this study alone

Implications for practice & future research

❑ It is apparent from the wealth of previous research findings, and the tentative conclusions of this study, that story books should be embraced as a tool in the teaching of mathematics

❑ It is imperative, therefore, that the barriers identified by Prendergast et al. (2018) are addressed and school leaders equip teachers with the resources and confidence to incorporate children's literature in maths lessons

❑ A question for future research might be whether the teaching of any specific areas of the maths curriculum can be particularly enhanced through the use of maths-related picture books, or indeed, whether some areas see little benefit. It may also be of value to investigate whether the approach is more suited to, or has a greater impact on, any particular age group

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