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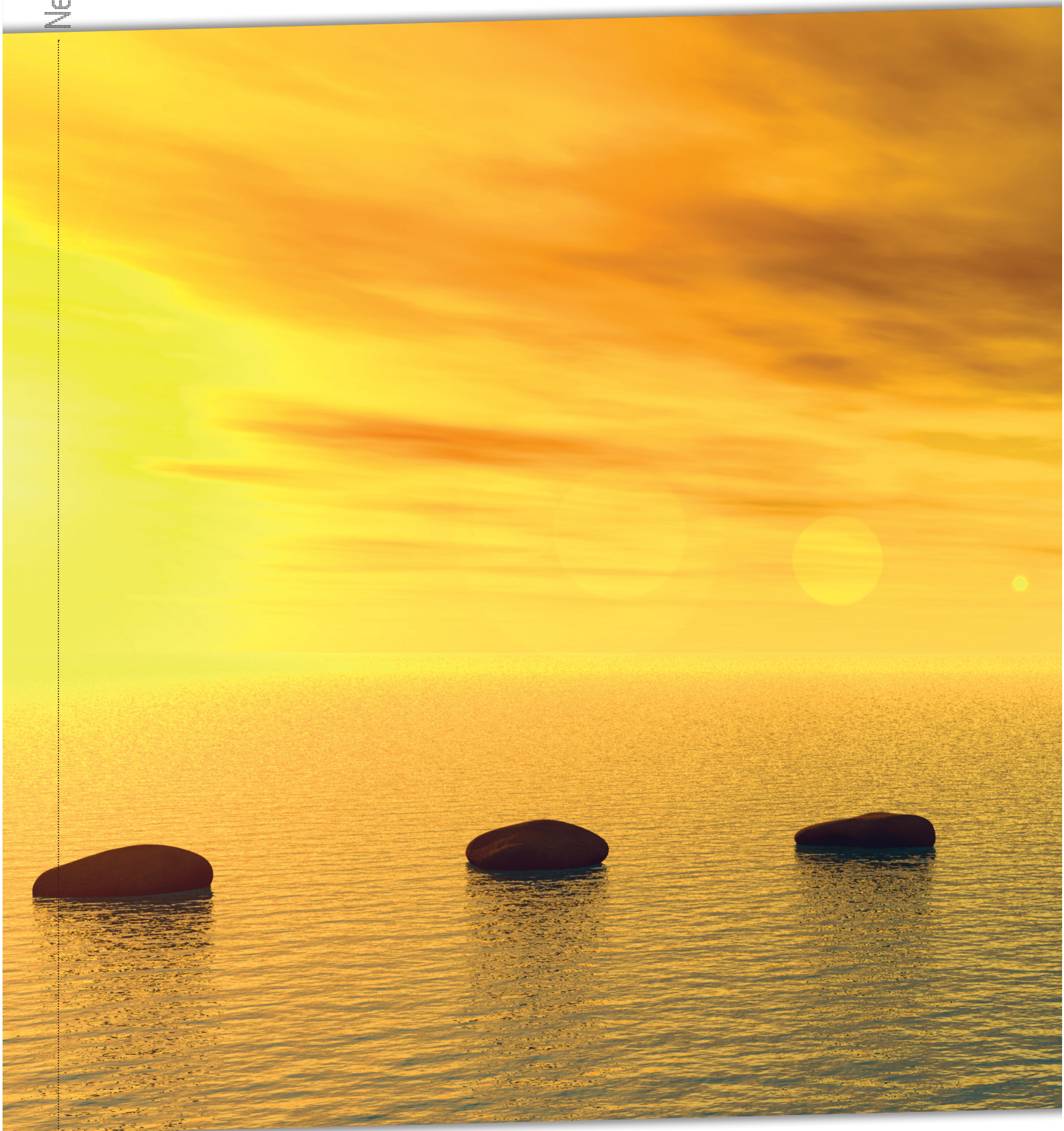
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8 Steps To Improving Learning And Teaching Through Education Technology Research

I By Dr Shelley Kinash I

One of the key differentiating characteristics of quality schools and universities is their distinctive value proposition in the area of learning and teaching. Quality schools and universities strive to make an outstanding contribution to student learning, engagement and the overall student experience.

As leaders in learning and teaching, teachers have an opportunity (and some would say an obligation) to build and share new knowledge and application with others to advance the overall sector of education. Learning and teaching has become a national pillar of renowned research excellence. One of the content areas where Australian researchers have made a particularly notable contribution is in producing robust evidence for the effect of education technology on learning outcomes.

There is a strong dynamic and role alignment between research and teaching. Both researchers and teachers are knowledge workers, synthesising, interpreting, sharing and applying information. Both need skills in written and spoken communication. Both need to have inquiring minds, thinking about and probing *how* and *why*. Both teachers and researchers need to inspire and motivate others.

In thinking about the roles of teachers and researchers, it becomes difficult to tease out where one activity ends and the other begins, or which comes first. Is it possible to teach without asking questions and collecting data about whether students are learning? Is research of any value if no one is taught how to apply the findings?

Most schools and universities interweave teaching and research in their goals and mission statements. For example, four of the key actions at Bond University, as articulated through the Strategic Plan, are to:

- ensure the highest quality of teaching
- build a set of activities and events that communicate the influence and impact of Bond's activities, especially research and community

- develop a research strategy that concentrates areas of research excellence

- establish external partnerships with high profile research organisations to affiliate with Bond.

In other words, conducting learning and teaching research are key actions of Bond academics. Each of these key actions requires the integration of learning and teaching with research. It is impossible to *ensure the highest quality of teaching* without providing research evidence and using data to close the loop. In a university that is renowned for quality learning and teaching, *build(ing) a set of activities and events that communicate the influence and impact of Bond's activities, especially research and community*, it is natural that key activities and events be in the area of education. To *develop a research strategy that concentrates areas of research excellence* means highlighting learning and teaching, with a strong focus on education technology. Finally, *establish(ing) external partnerships with high profile research organisations to affiliate with Bond* means connecting and collaborating with schools, educational research organisations and ministries of education.

Here are three of the most popular reasons why teachers conduct learning and teaching research (particularly in education technology):

1 Learning and teaching research enables teachers to refine their approaches and thereby ensure the highest quality of teaching and an outstanding contribution to student learning.

Learning and teaching research benefits a teachers own students, and through an evidence-based approach, it helps teachers to become better teachers.

2 Teachers seek to build new knowledge and share this knowledge with others.

Learning and teaching research benefits other teachers and their students. It helps the whole education sector to improve.

3 Conducting and publishing learning and teaching research is a rewarded activity.

Learning and teaching research can lead to promotion, professional development review bonuses and benefits, and internal and external awards and grants.

The remainder of this article focusses on strategies and *how to* advice. Every teacher can also be a researcher. Here are eight steps to improving learning and teaching through research into education technology.

1 Observation

The first step is to indulge your curiosity. What do you observe about your students and/or your teaching that makes you wonder? For example, do you wonder whether students work harder when they are allowed to choose their own groups, or when you assign them to groups? Are interaction patterns different when students are working together online versus in class? Have you observed a change in student attendance when you put more materials online? Do students engage with social media when you use tools such as Facebook, Twitter and Instagram for educational purposes?

2 Question

Pose a research question. The question should be meaningful, achievable and measurable. For example, you might pose the question – How do the number of views compare when YouTube videos are posted by students versus by the teacher?

3 Hypothesis

Form a hypothesis. Justify that hypothesis through conducting a review of the literature. What are the key findings of other research studies that have posed similar questions? It is particularly interesting when your hypothesis is not confirmed; it provides you the opportunity to puzzle over why the surprising outcome occurred.

Is it possible to teach without asking questions and collecting data about whether students are learning? Is research of any value if no one is taught how to apply the findings?

4 Aims

What do you aim to accomplish through this research? What are your intended consequences? What difference can you make through your research and its dissemination? Here are sample aims we wrote for a completed multi-institution research project about student evaluation of courses and teaching.

The aims of this project are to describe and disseminate Australian case studies of effective systems, approaches and strategies used to measure and improve course engagement and learning success through the use of online student evaluation systems. Six institution project partners have developed innovations. This project aims to disseminate these and additional strategies to the sector.

Note that these aims define a specific topic of research and identify the intended application and impact of the research. A focus on improvement and *making a difference* means that education research is different from many other fields of research.

5 Method

Education researchers use qualitative, quantitative and mixed methods research methodologies. Some of the commonly used approaches are:

- design-based research
- quasi-experimental research
- survey analysis
- phenomenology
- critical theory
- ethnography.

It is important that the selected method suits the question and context. One way that many researchers decide which method/s to use is by reading published research that posed similar questions. Which method/s did these researchers use and what were the strengths, limitations and outcomes produced?

6 Results (Data and Analysis)


The next step is to record and report the data and then analyse that data. Examples of data that might be collected in education technology research include: number of online views or posts, time spent on-task, number of correct responses in online assessment, themes emerging from posts, and sentiment as expressed through interviews and/or focus groups. Data is often presented through tables and figures. Quantitative data can be analysed through descriptive statistics and sometimes through correlations. Validity and reliability are important to establish. Are your conclusions accurate based on the data you have collected? If other researchers were to follow the same approach you described, would they derive the same results? What if the research were conducted with another class? Qualitative data is often analysed by themes. What were the salient themes and what do they indicate? How do these themes apply beyond those included in your research?

7 Discussion

The researcher now considers the data with respect to the posed research

question/s. What conclusions can be drawn based on the results? What further questions were provoked? Was there anything surprising? Was your hypothesis confirmed? Do your results align with the results of published research studies? Why or why not? What are the implications and applications?

8 Conclusion (Application, Limitations, Dissemination, Engagement, Impact)

One of the differentiating characteristics of learning and teaching research is that it is usually *applied* rather than *pure*. The reason you are conducting learning and teaching research is often to inform improvements to your own teaching and your own students' learning. Perhaps you want to know whether there is evidence that an education technology innovation you have implemented is actually making a measurable difference to student learning. You might have an idea that you believe will improve education overall, or you have tried something with your students that was a resounding success and you want evidence so that you can convince others to adopt this approach. Therefore, it is important that you discuss the application and relevance. In addition, it is important to clearly depict limitations. For example, should readers be cautious about application of your findings given the small number of people interviewed? Was there something particular about your student group that would mean your approach may not work in other contexts? Dissemination through publication, presentation and facilitation of professional development will heighten the impact of your learning and teaching research. Improving the learning experience of your own students is important; sharing your successes with others will heighten the impact. 

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