

## Professional learning in higher education: Understanding how academics interpret student feedback and access resources to improve their teaching

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Previous research on professional learning has identified that face-to-face consultation is an effective approach to support academics' learning from student feedback. However, this approach is labour and time intensive, and does not necessarily provide all academics with just-in-time support. In this article, we describe an alternative approach, which involves the creation of *Ask Charlie*, a mobile website that visually represents results from student evaluation of teaching (SET), and provides academics with personalised recommendations for teaching resources. *Ask Charlie* was developed and evaluated by drawing on design-based research methods with the aim to support professional learning within higher education. A semester-long evaluation of the website led to recommendations for improving the effectiveness and value of online, personalised, and interactive resources for academics. While *Ask Charlie* offered access to a valuable teaching resource portal, it was crucial that its design took into account time as well as timing in terms of supporting professional learning. Our findings suggest that future development of the website could include additional features to encourage reflection and communication as well as promote alignment with existing professional development strategies across the university.

### Introduction

Professional learning is an active, self-directed, iterative, and ongoing process (Easton, 2008). Prior research suggests that professional learning is most effective when it is situated in a specific context, social in nature, and distributed across people, resources, and tools (Putnam & Borko, 2000). Within higher education, professional learning may take many forms, including formal seminars and informal conversations, and it may involve digital resources and online interactions. The development of a mobile website to engage academics with the results from their student evaluation of teaching (SET) results represents a novel approach to supporting professional learning within higher education. Student feedback, when accompanied by professional development, can lead to long-term change and improved results (Marsh & Roche, 1993). Traditionally, this approach has involved individual face-to-face consultations with formal or informal mentors. However, this is labour and time-intensive, and it does not necessarily provide all academics with timely and relevant support (Penny & Coe, 2004).

In this project, our key focus was to develop an interactive and cross-platform mobile website that could be used to support academics in their professional learning. Specifically, we sought to design a website that would allow them to readily interpret student feedback and access resources to improve their teaching and support their students' learning. In our design and evaluation of *Ask Charlie*, we considered how the website could provide a sustainable approach to professional learning by offering just-in-time support in a way that is effective, research-based, and pedagogy-driven. The initial development was driven by three key elements:

1. Motivation: SET is used as a measure of teaching performance in nearly every university (Zabaleta, 2007); it is increasingly used in relation to performance reviews, promotion cases, and tenure decisions. Consequently, SET results were selected as an area of focus, as they may encourage academics to engage in professional learning related to their teaching.
2. Content: A focus on assessment within higher education was chosen in order to build on existing knowledge about individually structured interventions to enhance teaching effectiveness and focus on assessment practices, which are arguably the most important elements of university curricula for teachers and students (Joughin, 2010). This meant two things; we included feedback from students on their experience of assessment, and we sought to encourage academics to develop their own teaching through resources that deepened their understanding of assessment practice.

3. Format: A mobile website was identified as delivery medium in order to meet academics' ongoing professional learning needs as they strive to overcome teaching problems in everyday settings and move between using smartphones, tablets, and desktop computers at work and at home (Sharples, Taylor, & Vavoula, 2005).

In this study, we drew on the theory of situated cognition and employed design-based research methods to create, develop, and evaluate *Ask Charlie* (online at AskCharlie.co). In effect, it is a software application of Marsh and Roche's (1993) paper-based *idea packets* of recommended teaching strategies that were provided to academics on the basis of their SET results. In combining a sustainable approach to resource provision with an assessment focus, the mobile website implements and advances a recommendation from a recent study (Rice, 2011) for enhancing assessment, as the issue:

[I]s not necessarily to generate new ideas about assessment, since there are plenty of those lying around unused, but rather to connect academics ... with ideas about assessment in a form that ... offers pathways to solutions. (p. 2)

Consequently, *Ask Charlie* includes the latest evidence-based digital resources, such as guides to using rubrics and scaffolding assessment tasks as well as video-supported exemplars of best practice, which are linked directly to academics' SET results in an interactive and appealing design.

A design-based research framework allowed us to incorporate feedback from academics, the intended users of the mobile website, during each of the iterative phases of design, analysis, and redesign. Design-based research often involves artefacts, which are "policies, programs, or pedagogical tools that individuals employ to promote, evaluate, or understand learning" (Halverson et al., 2010; p. 172). In order to build an educational artefact, it is critical to understand users' beliefs, practices, and needs. We conceptualised *Ask Charlie* as an artefact and used the Halverson et al. (2010) design framework (see Figure 5) as a way to understand how academics, as both real and potential users of *Ask Charlie*, participate in formal and informal professional learning, engage in assessment, and learn from SET results. This study aimed to answer the following questions:

- How do academics typically design assessments and interpret student feedback?
- How can design-based research support the iterative development of a mobile website to support professional learning in higher education?
- How do academics access, navigate, and use the mobile website to support their teaching practices?

### ***Ask Charlie*: A new approach to professional learning**

This project was situated at an Australian university and supported by an Office for Learning and Teaching grant from the Australian Government. The first aim of this project was to engage academics with their SET data on assessment by delivering these results as appealing infographics (Vande Moere, Tomitsch, Wimmer, Boesch, & Grechenig, 2012). Unlike past SET reports at the university that focused on single-semester numerical data, the website enables academics to easily interpret their latest results, see visual representations, and identify trends in their data across several semesters (see Figure 1).

The second aim of this project was the provision of personalised best practice resources and case studies, both by computing automation using the data on class size, year level, and discipline from the SET database system, and interactively, through active control (Coursaris & Sung, 2012). Once academics log in they are able to select the types of assessment tasks that they currently use, such as a multiple-choice final exam or a research essay. Then academics can access recommended approaches based on their class size and discipline; for instance, for an academic teaching a large first-year science unit, short online quizzes staged across a semester could be recommended. They are also able to set goals and personalise a digital record of their plan, which is important for providing "a sense of purpose and direction in teachers' improvement efforts" (Penny & Coe, 2004; p. 247).

Academics can also search resources within *Ask Charlie* by assessment type, assessment mode, feedback type, group work, level, and discipline. Each resource includes a short description of how it could be used in assessment, comments made by academics, and number of views. Along with curating 60 online

resources, case studies, and journal articles, we produced 60 short videos from university teachers and students to encourage academics to implement new assessment strategies.

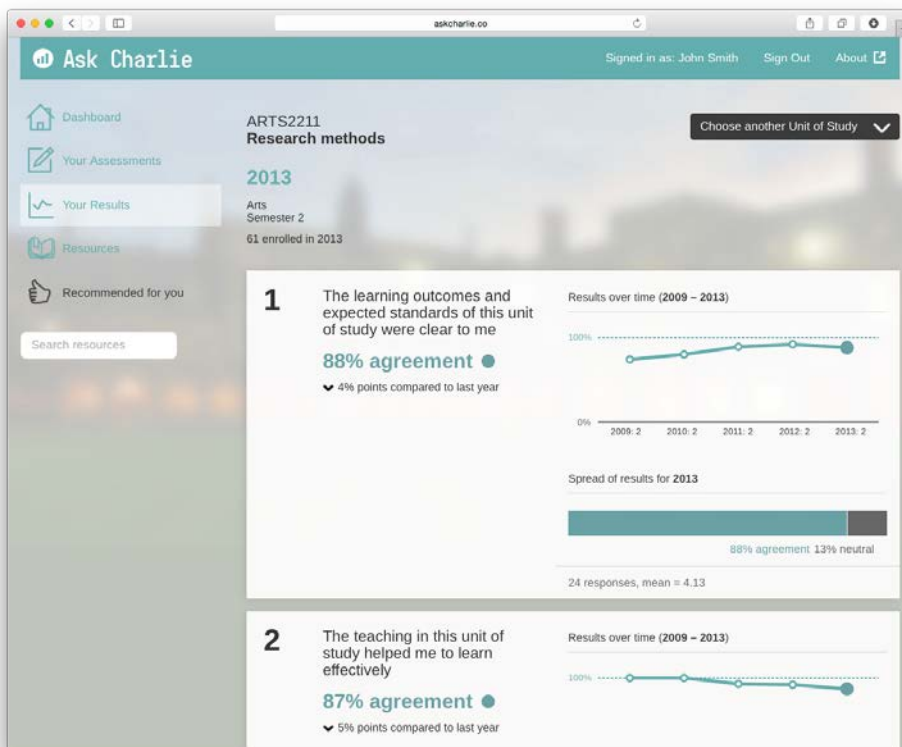


Figure 1. SET results for a unit of study, where data is available from 2009-2013

The third aim of this project was to engage academics in connecting and networking with other website users as well as colleagues involved in the best practice case studies and videos. Academics are able to directly contact colleagues featured in the teaching resources in order to seek advice or arrange informal conversations, from which they can learn about teaching (Thomson, 2015) (see Figure 2). Such peer consultation around student feedback “facilitates the development of a collaborative learning culture in which there is sharing and openness about teaching” (Penny & Coe, 2004; p. 245). Automatic reminders are sent to academics via email, following the success of this reminder strategy in the original research on face-to-face consultation (Marsh & Roche, 1993).

In order to achieve these aims, we drew on prior theoretical and empirical work within educational psychology that highlighted the situated nature of cognition (Brown, Collins, & Duguid, 1989; Greeno, Collins, & Resnick, 1996; Lave & Wenger, 1991). Importantly, this challenged previous theories that conceptualised cognition as an internal state and that defined learning as the acquisition of knowledge. A situated perspective on cognition highlights how physical, social, and cultural contexts are integral to the process of professional learning (Curwood, 2014a; Curwood, 2014b). Given this theoretical framework, our methodology needed to account for: (1) academics’ assessment practices within higher education; (2) academics’ beliefs and experiences related to using SET results as part of their professional learning; (3) academics’ ongoing engagement with the various features and resources within *Ask Charlie*.

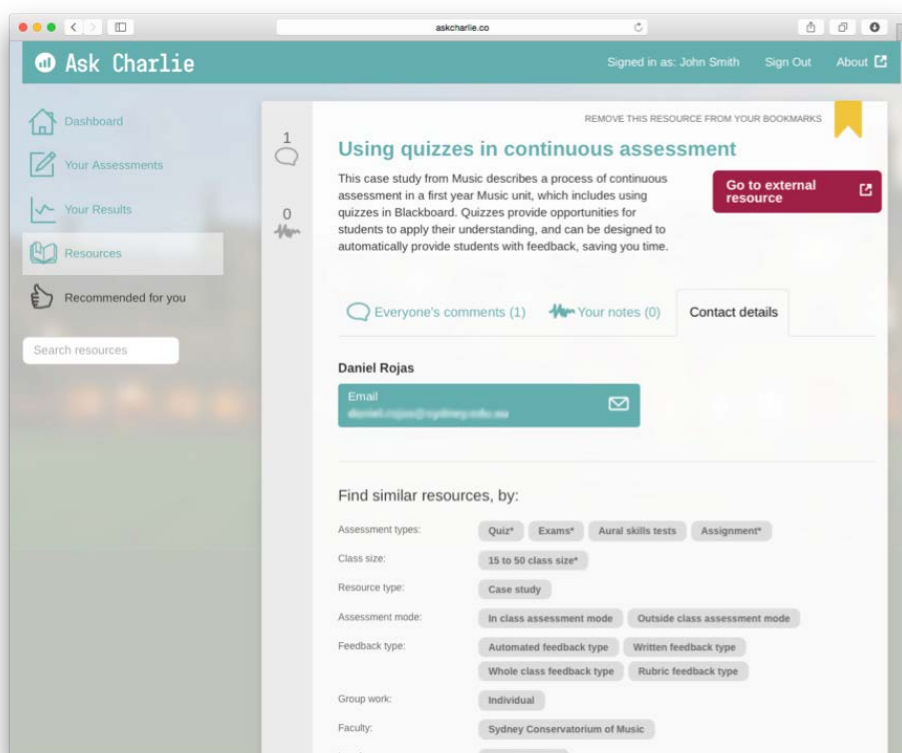


Figure 2. Contact details are provided for resources, where available, allowing website users to seek advice and/or arrange informal conversations

## Methodology

### Design-based research

This project drew on design-based research methods (Barab & Squire, 2004; Design-Based Research Collective, 2003), which focus on continuous cycles of design, enactment, analysis, and redesign within education. Rather than concentrating exclusively on the design process or the educational artefact, design-based research aims to advance theoretical understandings of teaching and learning that transcend “the environmental particulars of the contexts in which they were generated, selected, or refined” (Barab & Squire, 2004; p. 5). Design-based research posits “synergistic relationships among researching, designing, and engineering” (Wang & Hannafin, 2005; p. 5). These processes involve participant collaboration as well as iterative design and implementation in order to advance educational theories and practices. Rather than simply demonstrating how a particular design works, researchers must generate evidence-based claims related to learning (Barab & Squire, 2004).

The project combined and built on existing knowledge from the following areas. Firstly, it drew on the theory of situated cognition in order to understand professional learning as an active, self-directed, and ongoing process within higher education. Secondly, the project utilised selected data from standardised SET at an Australian university (Barrie, Ginns, & Prosser, 2005; Ginns, Prosser, & Barrie, 2007). In particular, the website and the resources were constructed around the SET item related to the capacity of assessment to support students’ learning. Specifically, this item prompted students to consider whether, “The assessment in this unit of study allowed me to demonstrate what I had understood.” While the wording of this item may vary across universities, there is commonly an SET item focused on assessment. This item was selected since constructive feedback and clear learning outcomes are key indicators of quality assessment (Chalmers, 2007). Thirdly, the project included evidence-based resources on assessment. It does so by building on existing online case studies that apply the university’s student-focused assessment for learning principles.

## Project context

The university's quality assurance of teaching policies and processes are aligned with national systems. The SET tools are based on a common underlying student-centred model of teaching and learning, and they prioritise data on students' perceptions of their learning experience. To that end, the university employs a standard survey of eight items, including questions on assessment, learning outcomes, engagement, and teaching. The survey is customisable at faculty level by the addition of four optional faculty-designated items, such as items on feedback, course materials, and online support.

Even though different tools are used at different levels, and for different purposes, the commonality of the underlying theoretical perspective on teaching and learning and clear articulation between the tools ensures:

1. That improvement efforts at different levels and in different parts of the university are aligned and strategic; and
2. That improvements at faculty and institutional levels will be reflected in improvements at higher levels and can be recognised and rewarded.

The SET surveys system is managed and administered by a central unit that focuses on teaching and learning across the university. In addition to the development, administration, data entry, analysis, and reporting of the standard survey, this central unit supports staff and faculties to interpret and respond to survey data, for example, to inform curriculum review. Currently, there is support for the administration and management of the surveys system, but not all academics perceive there to be adequate support and/or incentive to use their SET results to make changes to their teaching.

In its current form, *Ask Charlie* focused on data from the most widespread SET: student surveys of individual units. The current survey system was endorsed by the university's Academic Board in 2001, and there is survey data available from that point. Some faculties have their students complete a survey for every unit every semester. The minimum specified by university policy for all faculties is to have the survey completed for each class once every 3 years. The survey reports for individual units can be compared from semester to semester and aggregated to program and faculty levels. The survey is designed to support unit coordinators in enhancing the quality of student learning in units of study and also to support faculties in recognising the contribution of outstanding units of study to the overall quality of teaching and learning in the faculty.

Unit of study coordinators are able to choose whether they would like to collect feedback from their students using paper-based forms or online surveys. Reports are returned to unit of study coordinators and faculties in the form of PDF reports (Figure 3). At the time of this project, the majority of surveys were completed on paper. Consequently, the current version of *Ask Charlie* only displays the numerical data collected through the SET surveys, since written feedback was not available in digital form for the majority of units of study.

## Participants

In Phase 1, a total of 15 academics and 2 students participated in focus groups and interviews. They represented disciplines across the Faculty of Health Sciences, Medical School; the Faculty of Architecture, Design, and Planning; and the Conservatorium of Music. Their roles ranged from academic appointments of associate lecturer, lecturer, and senior lecturer, to educational designer, and research fellow.

In Phase 2, 48 academics volunteered to participate in a semester-long trial of *Ask Charlie*. They received a personalised user account, with access to their SET data. Eighteen from this group of trial participants completed a pre-trial online survey. Survey participants were from a variety of faculties and discipline backgrounds including Health Sciences, Medicine, Arts and Social Sciences, and Architecture, Design, and Planning. In Phase 3, 5 academics who had participated in the mobile website trial were individually interviewed.

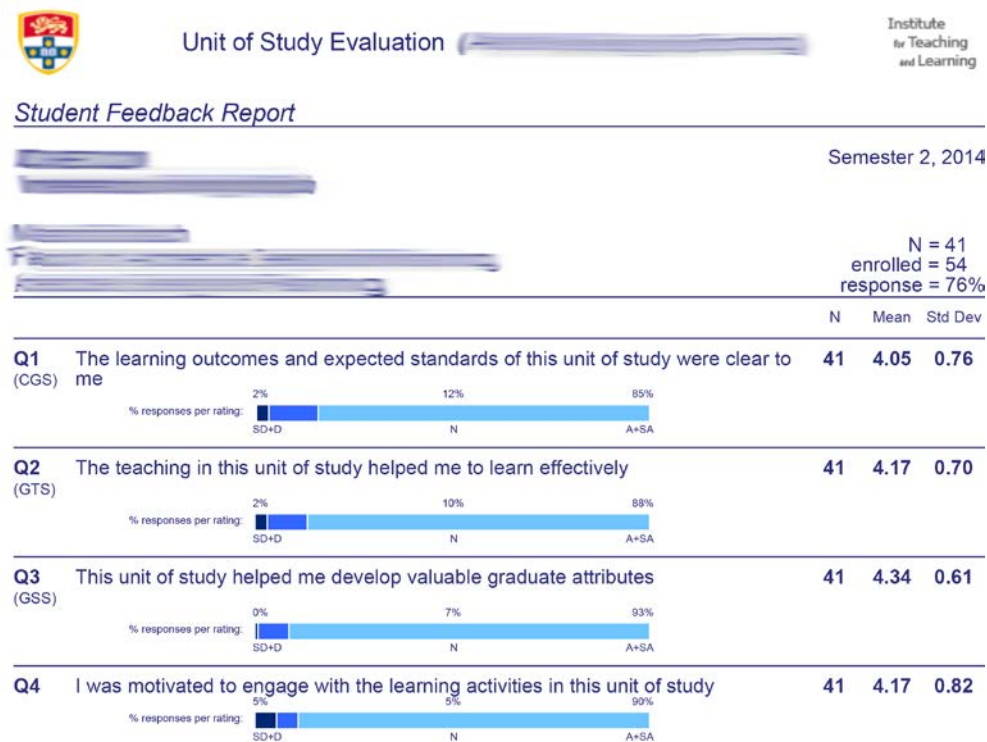


Figure 3. Extract from student feedback report generated from the unit of study evaluation data, as it is currently provided to unit of study coordinators and faculties

### Data collection

Data collection occurred within and across three phases (see Table 1 and Figure 4). The first phase of the project (May to June 2014) focused on the design and development of the mobile website following an iterative, user-centred design process to ensure its usefulness and acceptance to academics. Early versions of the website were tested in three subsequent 2 hour focus groups (each with different academics), as well as individual interviews ranging in length from 30 to 60 minutes. This iterative prototype testing with a small number of users allowed for the elimination of any usability issues, ensured that the website addressed the target audience’s needs, and provided opportunities for collecting qualitative feedback. The first phase also involved in-depth interviews with academics and students which resulted in the production of 60 short videos with academics and students related to interpreting student feedback, engaging in instructional design, and creating effective assessments. Academics were chosen and invited to participate in the videos based on their high student ratings for assessment in their SET feedback; these were then added to the *Ask Charlie* resources.

In the second phase of the project (July to November 2014), the mobile website was made available online and academics were invited to participate in a one-semester evaluation. This phase involved a pre-study survey to collect background information about participants and their familiarity with mobile technology. The data from this survey helped us to understand the demographics and profiles of our participants, which was used to explain observations made during the trial. The third phase (November to December 2014) involved post-trial interviews with academics who had used the mobile website in Phase 2. All participants from Phase 2 who agreed to be contacted for follow-up interviews received an invitation for an interview. The interviews allowed us to collect in-depth qualitative data about the helpfulness and utility of the mobile website and how academics used it in their teaching.

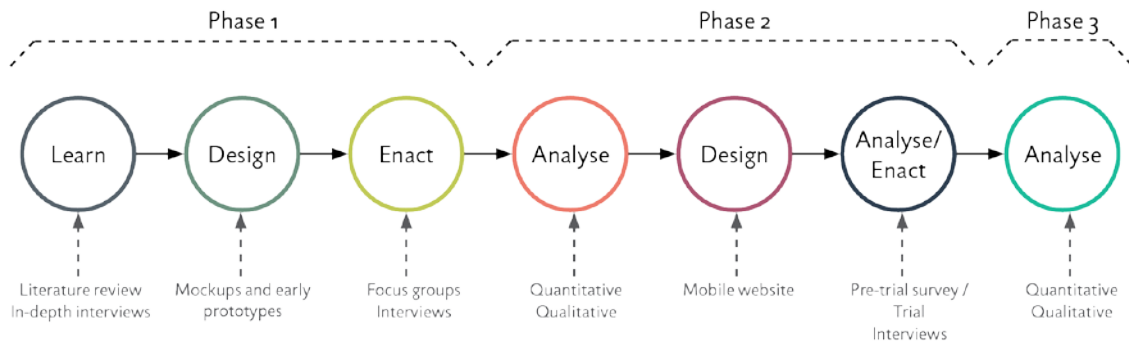


Figure 4. The design-based research cycles learn, design, enact, and analyse (Barab & Squire, 2004; Design-Based Research Collective, 2003), and their application throughout the three phases of the project.

Table 1  
 Overview of research methods and participants across the three project phases

Phase	Data Source	Number of Participants	Faculty
Phase 1 First iteration of the mobile website - Mockups and early prototypes	In-depth video interviews	5 academics and 2 students	Arts and Social Sciences, Education and Social Work, Dentistry, Health Sciences, Science
	Focus group evaluations of initial prototype	6 academics	Architecture, Design and Planning, Health Sciences, Medicine, Music
	Individual evaluations of initial prototype	4 academics	Architecture, Design and Planning, Health Sciences
Phase 2 Second iteration of the mobile website, based on Phase 1 analysis	Pre-trial survey	18 academics	Agriculture and Environment, Architecture, Design and Planning, Arts and Social Sciences, Education and Social Work, Health Sciences, Medicine
	Mobile website trial	48 academics	Arts and Social Sciences, Architecture, Design and Planning, Education and Social Work, Engineering and Information Technologies, Health Sciences, Medicine, Pharmacy
Phase 3 Future iterations of the mobile website	Post-trial interviews	5 academics	Architecture, Design and Planning, Health Sciences, Medicine

### Data analysis

In the design framework meta-representation (see Figure 5), the triangle at the centre represents the educational artefact. The design framework focuses on the construction and evaluation of educational artefacts (Halverson, 2004). When designers build artefacts, they include features that they believe will positively influence the way that users think and work. Artefacts, then, are designed for specific purposes. Artefact features reflect, support, and potentially prescribe the intended use of the artefact. While designers intentionally build features into artefacts, they cannot fully predict whether these will be taken up as affordances by users. Affordances are what users see as the positive features of an artefact, which may or may not be those intended by the designer.

The features and affordances of the artefact are placed within the triangle. At the left, outside of the artefact triangle, are the intentions, which inform the creation of an artefact. For instance, an intention of *Ask Charlie* was to increase academics’ knowledge of assessment practices. Designers’ intentions influence the features that are created for an artefact. Since both intentions and features are often generated by designers who are not the end-users of an artefact, their romanticised artefact features may

not be taken up as affordances by actual users. For instance, the case studies and videos within *Ask Charlie* teaching resources included the contact information from academics. We built this feature into the artefact with the intention that users would contact the academics directly; however, users did not necessarily perceive this as an affordance.

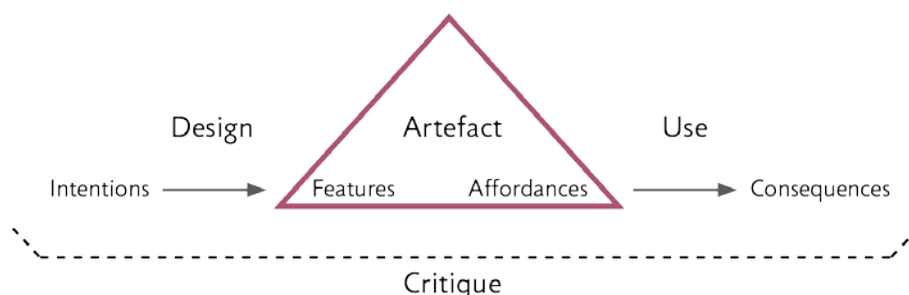


Figure 5. Visual representation of the design framework, as conceptualised in Halverson, et al. (2010).

Located at the right base, outside of the artefact triangle, are the consequences of the design process. Consequences are the outcomes of the design. In examining the consequences, designers evaluate what features of the artefact were actually taken up as affordances. The outcomes of the design can be evaluated to determine how effective a particular artefact is in meeting the original design intentions. Future designs might then be undertaken based on the analysis of these consequences.

Lastly, the critical perspective underlies the entire design framework. By utilising the critical perspective, it is possible to examine how designs are created and utilised within particular social, historical, and political contexts. This perspective allows designers to explore how their proximal or distal position in relation to an artefact can significantly impact the design process and the potential success of implementation. At many universities, for example, there has been an increased focus on online assessment. Consequently some of the teaching resources and videos highlighted the experiences, both positive and negative, of academics who have incorporated online assessment into their courses.

Since one of our aims was to engage academics with their SET data on assessment, we first needed to investigate academics' beliefs and practices related to instructional design. As a design-based study, we built on previous case studies of academics at the university and conducted in-depth interviews and focus groups with academics as well as undergraduate students. The in-depth interview questions and focus groups probed academics' backgrounds, assessment practices, approach to instructional design, and interpretation of SET results. These were important in three key ways. First, they highlighted academics' beliefs about the role of assessment and their practices related to instructional design as well as how they engage with SET results and use student feedback to inform their teaching. Second, the interviews were professionally video-recorded and edited, resulting in case study testimonials available to *Ask Charlie* users within the online resource collection. Third, in terms of the design framework, they offered insight into academics' intentions, which subsequently shaped our design of the artefact and incorporation of key features.

The design framework informed our development of *Ask Charlie* as well as our data analysis. For instance, we asked ourselves: What were the intentions built into the artefact by the designers? This clarified how important motivation, content, and format were in our initial conceptualisation of the mobile website. In thematically analysing the data from surveys, interviews, and focus groups, we engaged in multiple cycles of coding (Miles, Huberman, & Saldaña, 2014). In the first cycle of coding we analysed the transcripts line by line and labelled meaningful fragments with *in vivo* codes, which use participants' own words as codes. Here, we considered: How did academics (as website users) intend to use the artefact? What features did academics perceive as affordances? What were the consequences of the artefact implementation, and did academics change their beliefs and practices? How can we critique the iterative design process? These questions supported our development of the mobile website; for example, they highlighted that there may not always be alignment between designers' intentions and academics' practices. During the second cycle of coding, we identified patterns across data sources and changed *in vivo* codes to descriptive codes. This allowed us to reduce the total number of codes, clarify their meaning, and highlight salient themes.



## Findings and discussion

In this section, we present key findings from our investigation of academics' current practices and results from the semester-long trial of *Ask Charlie*. Since design-based research focuses on examining particular educational contexts, and the design framework highlights the importance of understanding users' needs and experiences, we begin by discussing our interviews with academics related to their processes of engaging in instructional design, creating assessments, and interpreting student feedback.

### Gaining insight into academics' knowledge of instructional design, assessment, and student feedback

#### *Instructional design and assessment across disciplines*

A thematic analysis of the focus group and interview data revealed important insights into how academics conceptualise, design, and implement assessments as well as how they engage with and interpret SET results. Since design-based research highlights the importance of theories and practices within educational contexts, Phase 1 provided key information about academics' relevant experiences and beliefs, and this shaped our design of the mobile website. Academics and students emphasised that the purpose of assessment is for students to demonstrate their disciplinary learning and to prepare for their future professions. A lecturer from the Faculty of Health Sciences stated, "The tasks that I use certainly not only help the students develop knowledge, but also practical skills in problem solving clinical cases and learning how to work collaboratively with one another." Several also noted how their assessments reflected professional standards and ensured that their programs were accredited by national organisations.

Academics across multiple disciplines stressed the importance of varied, incremental, and formative assessment. Within a single unit, for example, assessment tasks may be both traditional (such as essays, exams, or research projects) as well as creative (such as digital stories). By having variety within and across assessment tasks, students had multiple opportunities to demonstrate their learning. Incremental approaches to assessment also offered students valuable guidance. One undergraduate student described how an arts unit included an annotated bibliography as part of a research paper; she appreciated the time tutors allocated to explicitly discussing expectations for the assessment task and guiding students in developing their topics. Also, rather than having a limited number of high-stakes summative assessments, academics valued formative assessment that involved low-risk tasks and timely feedback. This was accomplished in several ways: providing time for peer assessment in tutorials, giving general feedback (based on the cohort), and giving specific feedback (tailored to the student) on a regular basis.

Several academics described how detailed marking rubrics are instrumental to effective assessment. Specifically, marking rubrics allow them to: clearly communicate expectations and assessment requirements to students; facilitate the marking process and support workload management; clarify standards to markers and students; and result in more fair and accurate marks. Two academics discussed using online assessment in order to expedite and standardise the marking process; one emphasised how this was critical in large classes in order to identify struggling students and save time with unit coordination. Only one academic specifically noted other factors that shaped assessment, such as funding for laboratory space and the lack of markers' related experience. The qualitative data analysis of the interviews revealed that academics valued instructional design that is iterative and reflective. A lecturer in the Faculty of Arts and Social Sciences, for instance, stated, "None of our courses should ever be fossils. They should all be courses that we're going on developing and we're going on thinking about, particularly the relationship between the assessment and the content of the course." In this regard, *Ask Charlie* offered academics ideas and resources to support the evolution of their pedagogy.

#### *Learning from SET results and other sources*

By conducting focus groups and interviews with academics across multiple disciplines, we were able to gain a deeper understanding of their beliefs and practices related to assessment. This in turn shaped our design decisions in Phases 1 and 2. SET results are one of multiple sources that academics draw on to understand students' engagement, achievement, and enjoyment within a particular unit. Along with an iterative approach to instructional design, academics discussed creating their own surveys, holding focus groups with students, discussing teaching practices with colleagues, and taking detailed notes throughout

the semester. However, it is also important to recognise that SET results are formal evaluations and as such, are highly valued within the university.

Data analysis suggests that academics look at SET results at one point in time, to determine students' experiences within a particular unit, as well as over time, to see how their instructional design and changes to assessment practices have influenced SET results over multiple semesters. SET results offer both quantitative and qualitative data on the student experience. One academic suggested that the former gives her a general understanding while the latter offers specific feedback related to the unit's content, pedagogy, and assessment. Another academic found that his SET results indicated that students prefer highly structured and scaffolded tasks; in turn, these increased students' confidence and engagement. For academics in the study, SET results can be useful in identifying particular areas of weakness, which can then be targeted in subsequent semesters.

The pre-trial survey revealed that just over half of the respondents (56%) had made changes to their teaching and/or assessment since the previous year. Of those who made changes, the majority (78%) said that they use their SET feedback to inform change. Respondents also said that other key resources that they find useful in developing their teaching are experienced colleagues (89%) and journal articles on university teaching (74%). This contrasts with reports that less than 40% of academics received advice from colleagues on their teaching (Norton, Sonnemann, & Cherastidtham, 2013), reinforcing the need for providing academics with other sources of support and development, such as online tools like *Ask Charlie*. Academics in this study used a wide range of assessments across the units of study that they taught in, including exams, essays, case studies, project proposals, quizzes, article reviews and posters. The changes that academics made to their assessment were generally focused on improving students' experience, e.g., "[I made changes] to make the assignment more engaging for students by giving choice"; "[because of student] confusion over instructions, I attempted to improve outcomes for all students [by] refining the focus of assessment to target its purpose more successfully." Some academics also mentioned that they made changes to satisfy curriculum or accreditation requirements.

## **Projected use cases and feedback on the mobile website prototype**

### ***Understanding academics' intentions***

The Phase 1 interviews and surveys of academics were instrumental in providing us with insight into how potential users of *Ask Charlie* engage in instructional design, create assessments, and interpret SET results. Since design-based research highlights the importance of educational context, these data sources allowed us to better understand the needs and experiences of potential *Ask Charlie* users. Drawing on the design framework, the data suggested that academics may engage with the mobile website with specific intentions, such as:

1. Finding targeted resources to improve the design and implementation of assessments, both generally and within certain disciplines;
2. Connecting with other academics to share experiences and examples because of their reported preference for using experienced colleagues in the past; and
3. Understanding SET results, including in particular semesters and over time.

The data from the initial in-depth interviews with academics was used to inform the design of the first iteration of *Ask Charlie*. A second set of focus groups and interviews was conducted to collect additional data about academics' current use of SET results and to evaluate the first iteration of *Ask Charlie*. For example, emails sent to academics were identified as a useful way to remind academics about the website, and provide updates about relevant resources as appropriate. It was agreed that the tone of these emails was important to ensure they prompted access to the website, but did not irritate users or make them feel guilty for not having accessed the website. Phase 1 feedback was also used to make simple design changes, such as re-labelling the *resources* button, *view recommended resources* to make the purpose of interactive elements clearer to first time users.

An issue identified during Phase 1 was the lack of time available to academics, particularly for developing their teaching. One of the changes made to encourage users to quickly understand and engage with the resources, was to revise the titles of the case studies and other resources. This meant that the focus for the resources became the content (such as topic area or teaching practice) with the discipline as

a secondary focus. For example, one resource had previously been named, “A case study in discipline A” and was changed to, “Group work for large classes in discipline A.” Given the importance of iteration within design-based research, this change was made as a direct result of the interviews and focus groups with academics.

Overall, academics were positive about the website as a source of support for their teaching development. The website was seen as an opportunity to make their teaching more innovative, effective, or aligned with their colleagues’ practice. The identification of personalised results and resources were appreciated, and this encouraged users to engage with the website because they saw it as relevant. In a context where academics describe often feeling left alone to develop their teaching, any support is valued. One staff member noted that the feeling of isolation is exacerbated: “If you’re a part timer and when you do come in to work there’s no one available to ask a question, either in person or via email.” For them, the mobile website addressed this issue.

There was general agreement that academics would recommend the website to their colleagues, especially at times during the year when they are focused on their teaching. The website was seen not just as useful for planning, but had the potential to improve the efficiency of the planning process. It was seen as a support tool to help academics to identify a focus for improvement and provide direction and resources for that focus, “rather than staff wondering what to do next.” In addition to the barrier of time for teaching, a few study participants noted that some academics are more interested in teaching than others, so while the website has the potential to be useful to everyone, there are some who would be more interested in using it to develop their teaching than others.

### **Feedback from the semester-long trial**

#### ***Access, navigation, and use of the mobile website***

Designing a responsive website allowed academics to use the device and browser they were most comfortable or familiar with. The results from our Phase 2 pre-trial survey showed that the majority of participants (83%, 15 of 18) considered themselves familiar with mobile applications and 78% (14 of 18) regularly used them on mobile and other devices. However, only 39% (7 of 18) reported using mobile applications in their work as a university teacher. Requiring academics to use a device they had not used before may have represented a potential barrier to accessing the mobile website. As noted in the previous section, emails to academics served to remind staff that the website existed, and encouraged them to access it. This led academics to view or skim the suggested resources and to engage with the content, albeit quickly in some cases.

Key issues for academics who work in a research-intensive context include making time for teaching and teaching preparation as well as timing the various activities involved in teaching. These two aspects are interlinked, in that timing of activities allows academic to make more effective use of their time. From the initial focus groups and interviews we observed that academics would engage with SET results in different ways at different times of the academic year. For instance, they would read the results as soon as they are released, and may use this as an opportunity to close the loop and send students a summary of the results. They would then again engage with their results deeper in the weeks leading up to the start of a semester, when they are preparing their unit material. For our study, this meant that access to the website had to be timed to occur during the beginning and end of the semester.

#### ***Presentation and interpretation of SET data***

Based on Phase 1 mock-ups and qualitative data analysis, the Phase 2 design resulted in a new landing page; notably, the first screen seen by academics when they accessed the website was their SET results, with a graph. This was seen as useful, especially if they liked what the results suggested about their teaching, either the results were improving over time, or the results were positive. This initial feedback may have helped to encourage further engagement with the rest of the website. A cautionary note is that if the results were seen as negative, while some staff may find that motivating, others may disengage with the website for teaching development.

A key feature of the mobile website is that it makes it easier to see trends across SET results and make comparisons from semester to semester; this is data that academics did not have access to before. This feature helped academics to interpret their results, which was something that academics identified as

challenging in Phase 1 focus groups. The role of the website in monitoring academics' progress towards plans, and then students' responses to what they have implemented was seen as helpful. From semester to semester, the website could allow academics to determine if the changes they have made affected the responses to the questions they focused on.

#### ***Value and use of personalised resources***

In Phase 2, we created a teaching resource portal. This was derived from the original aims of the projects and findings from Phase 1 and included personalised resources included journal articles, online materials, case studies, and videos. Personalised resources could be accessed from the SET results page as well as the assessments page. In both cases, the user was led to a page showing a selection of resources that were relevant to their assessment and units. The content of the entire list of 120 resources (accessible via a separate menu item, see Figure 2) was described as being of good quality, and they provided helpful ideas. However, their usefulness was limited as most academics found it too difficult to make changes to their teaching a few weeks into semester, which was when they started engaging with the website. The combination of a small collection of resources and the process for recommending resources by class size, level, and discipline meant that there were no perceivable major updates between reminder emails for some staff.

Some staff struggled with how to search the database for resources or what to do next. Other academics used the search function when they had time and in relation to a specific query. The bookmarking feature was easy to use, made sense, was easy to find and did not require too many clicks. Academics commented positively on the fact that resources appeared in order of relevance, reinforcing their perception that the website was personalised, as intended. Indeed, the resources were listed in order of relevance, using the number of matches between resource tags and assessment and unit attributes, such as type of assessment and class size.

#### ***Video resources – drawing on the experience and expertise of colleagues***

As part of this project, we produced a video that introduced users to *Ask Charlie's* key features and navigation pathways. In addition, the in-depth interviews with experienced academics were recorded, edited, and used as the basis for 60 short videos available within the *Ask Charlie* resources and also available at [Vimeo.com/AskCharlie](https://vimeo.com/AskCharlie). In these videos, the selected group of experienced academics discussed their approach to instructional design, their experiences with formative and summative assessment, and their process of interpreting and acting on student feedback. The videos were edited to provide short, direct messages to other academics. Academics reported that the videos prompted personal reflection and offered insight into others' pedagogy, even though not all academics reported making major changes as a result. It is seen as helpful to know what others' experience of teaching is like, this may help to address the isolation of the teaching role described by some academics.

A consequence of creating case studies in the form of video resources meant that some academics found it difficult to take the ideas and strategies and apply or adapt them to their own teaching context. These academics suggested that the teacher who is achieving good results in their teaching cannot necessarily convey how to achieve these results to others, and it may be that even if this teacher is good at communicating, that some academics will require more support than others to adapt ideas and strategies.

#### ***Connect feature – extending case studies to build collegial relationships***

Each of the case studies that were developed and published by the central unit for teaching and learning prior to the commencement of this project had the contact details of the academic involved so that website users could ask questions and follow-up with this person. From the Phase 3 post-trial interviews, it became apparent that most academics were not aware of this feature and therefore did not end up using it. This may have been because it was not promoted or because it appeared in a separate tab beneath each case study resource, and not on the initial page. Whether they used it or not, the connect feature was seen as a useful extension of the case studies. Academics stated that they liked this feature since sometimes "you hear about a good idea and you have questions, but you have no idea who to ask." They noted the benefits of the range of settings and disciplines provided by case studies, as sometimes the best ideas come from other disciplines, and academics' own discipline is not the limit of usefulness.

For improving the effectiveness of the connect feature, it may be necessary to place it more prominently in the website so that it can be easier discovered, and to design for a shorter, more informal way to get in

contact. Sending an email might be considered a too formal and burdensome way to get in contact. For that reason, we initially listed the academic's office phone number in one of the early prototypes of *Ask Charlie*. However, this approach was criticised by one of the interview participants, whose case study was included in the resources, expressing concerns that he is already busy enough and would not want people calling him all the time with question about the resource. An alternative promising approach might be to use a Twitter-like feature.

## Conclusion and Future Directions

Our design-based research drew on prior theoretical and empirical work that highlighted the situated nature of cognition (Brown, Collins, & Duguid, 1989; Greeno, Collins, & Resnick, 1996; Lave & Wenger, 1991). In order to support professional learning within higher education, our study design needed to account for academics' physical, social, and cultural contexts. For the most part, participants in the post-trial interviews found the website to be useful, and much of what we intended to achieve was achieved. They had suggestions for improvements to *Ask Charlie*, which in the language of the design framework, is considered critique, and is based on the use of the website in relation to the intended use.

Academics' physical contexts shape when, where, and how they work. To that end, the use of a mobile website as a delivery medium provided academics with flexibility and agency in accessing *Ask Charlie*. Moreover, the inclusion of visual representations of SET reports allowed them to readily interpret student feedback, identify trends over time, and direct their professional learning. By focusing on the design of a mobile website, our findings highlighted how professional learning is concomitantly facilitated by and restricted through available tools, and future iterations of the mobile website can:

- Improve navigation, perhaps through a video introduction with clearer instructions for how to navigate and use the website, or email reminders that promote specific features so that academics are aware of what they can do and achieve with the website.
- Create more opportunities for academics to tailor their experiences and maximise their autonomy in learning. Increasing autonomy will benefit users who prefer a flexible and responsive website; however, this should be balanced with scaffolding, such as guiding questions or checklists.
- Integrate a private note-taking feature into the mobile website, separate from public comments on resources. In doing this, the website could keep a record of the academics' personal reflections during the semester and when the SET results are released in order to compare their thinking to their students' experience.

Teaching and learning within higher education is significantly shaped by social contexts. In our initial design of *Ask Charlie*, we sought to provide academics with the opportunity to connect with others across traditional disciplinary divides. Consequently we included certain features, such as the contact details of academics profiled within the case studies, to encourage communication and even collaboration. However study participants generally did not see this as an affordance and did not contact academics directly. Moving forward, we can:

- Encourage academics to build a community around the resources, and allow academics the opportunity to contribute their own resources. This could include collating resources from elsewhere and suggesting them as relevant content in addition to developing new resources.
- Include videos of practice from lectures and tutorials, which might be one substitute for the face-to-face peer observation that is desired by some academics.
- Provide support to academics so they can see how teaching practices translate across disciplines. In promoting the comment and connect features, each case study resource could become more like an online recipe, where each academic shares how they made modifications and offers insight into the outcomes.

The cultural context of academia is often complex, and academics often find themselves playing a game where the rules are unknown. For instance, they may feel that student feedback is important, but they may be concerned about the degree to which it (formally or informally) affects their tenure and promotion. Our findings highlight how *Ask Charlie* can offer academics diverse resources that can support their teaching

and professional learning. In turn, this may allow them to more confidently navigate the cultural context of academia, engage in reflection, and improve their pedagogy, via the following suggestions:

- Provide access to anonymous SET data of other academics. This would be helpful for academics receiving their first SET results, as it would show what SET results look like for other academics, provide a benchmark, and moderate the negative response to unexpected feedback.
- Introduce additional sources of data. For example, this could include SET data from informal focus groups with students or feedback from colleagues.
- Several academics noticed the deliberate focus on resources about assessment, specifically assessment design. They were interested in using the website to explore resources on other topics. One suggestion was for unit coordination support, such as how to manage the role, how to manage teaching teams, and supporting tutors. Another suggestion was for resources targeted towards tutors, including on areas they can work on, like feedback on assessments.

The situated approach to professional learning highlights the importance of tools as well as time. Although we were aware at the outset of this project that time for teaching and timing of access were key to the website being used by academics, we misjudged the ability of academics to engage with resources during the semester. While teaching, academics would make very minor changes to what they had already planned, especially if they had large classes, where any changes can be stressful. The option to make changes is not wholly up to the academic; for example, assessment tasks cannot change after the unit of study outline has been finalised. Many spoke of the website being more useful during the design and planning phase of their teaching, which is the time between examiners' meetings for one semester and the first weeks of the next semester. This is the time when academics would be thinking about their teaching, and considering major changes. One academic used the analogy of harvesting versus planting – and suggested the website is more useful during the planting season. It is important that when designing a website for a particular group of users that we recognise and understand their needs, to ensure the website supports them.

Finally, the website could be linked to other opportunities for professional development to encourage uptake and engagement by staff. Our participants were unsure if and when other users would be accessing resources and commenting on those resources. This led to uncertainty around whether there was any point answering others' questions if some time had lapsed since the question was posted. The website could be available to staff participating in other professional development activities, and users could be notified that other groups would be accessing it during set dates and times and taking part in the discussion. For example, the university offers a 1 year Graduate Certificate in Educational Studies (Higher Education) program, and staff enrolled in the course could provide an ideal group of interested participants able to answer questions and suggest strategies for professional development.

In conclusion, this study has offered insight into how academics currently engage in professional development, and it provides a new opportunity for academics to participate in self-directed, digitally mediated professional learning through *Ask Charlie*.

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