Mobile Dynamic Frequently Asked Questions (DFAQ) for student and learning support

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Abstract

Most students are communicatively competent with SMS (short message service) texting. To the extent that SMS is text based and academic discourse is mainly text, it seems reasonable to exploit the communicative competence of SMS for teaching and learning. This paper discusses a project in which the communicative competence of SMS texting among students is being used to address some of the educational challenges, in particular the under prepared students, diversity, and large class sizes. Mindful of many unsubstantiated claims in literature about the revolutionary potential of ICT to improve the quality of education and many suggestions but few demonstrable examples, we did not want to add to the suggestion list. Thus, the objective of the paper is to demonstrate how an ICT application is being used to add value to student learning. The seamless integration of the SMS and the web interface coupled with communicative competencies and anonymity has had some impact on student learning. There are four ways by which learning has been impacted: firstly, exposure to other students' questions mirrored their own understandings / misunderstandings; secondly, the anonymity created a feeling of a safe environment which empowered students to ask and respond to questions; thirdly, students were able to monitor their own growth / development through observing their own changes in the way they asked questions; fourthly, the educator received feedback on where the students learning difficulties lay and was able to quickly respond to their learning needs.

Keywords: *Short Message Service (SMS); Knowledge Sharing; Student Support; Dynamic FAQ*

1. Introduction

Mobile-phones are extremely popular among students. However, these phones are used for social interaction as opposed to being an educational tool. One of the popular uses of mobile-phones among students is text messaging. The popularity and success of SMS text messaging among students suggest that students are communicatively competent with texting. To the extent that SMS is text based and academic discourse is mainly text, it seems reasonable to exploit the communicative competence of SMS for teaching and learning. Thus, texting competence provides an opportunity for creating learning environments that support students. For this reason, we wondered about ways we can use the social dimension of mobile-technologies and the existing communicative competence in text-messaging among students for the creation of a knowledge resource.

In conceptualising the construction of a knowledge resource, there were two challenges, the technical and the educational challenge. The technical challenge lay in the need to create a seamless two-way interface between SMS, web browser and database backend. The educational challenge was on how to use the informal consultations among students to support individual and collective groups of students, and how to create feedback loops to educators on the students' knowledge levels based on the questions they ask and the responses they receive from peers.

The motivation for extending the interface to SMS was drawn from the fact that the majority of students had mobile phones and were competent in using SMS. The other reason was the need to optimise student contact time with educators and fellow students for academic support as Toohey (1999) suggests, "whether students are officially 'on-campus' or 'off-campus', contact time with teachers is becoming increasingly precious and we need to use it for those kinds of learning which are difficult to achieve by other means" (p. 120). Mindful of many unsubstantiated claims in literature about the revolutionary potential of ICT to improve the quality of education (Hepp et. al., 2004) and many suggestions (Laurillard, 2001; Khine, 2003; Woods et al., 2004) but few demonstrable examples, we did not want to add to the suggestion list. Thus, the objective of this paper is to illustrate demonstrable value of how an ICT application is being used to support student learning at the University of Cape Town.

The paper is organised as follows. It begins with a discussion of the background to the project, describes the case study and gives a detailed description of the DFAQ environment. It then reports on the findings based on student experiences and concludes.

2. Background

The traditional classroom based pedagogies alone are inadequate to address the current educational challenges of under prepared students, large class sizes, diversity, renewed demands for graduate throughput to mention but a few. Hills (1987) points out that, "even the ways of traditional teacher have now been eroded and outmoded, for classes of mixed ability cannot be taught effectively by the traditional classroom method" (pp. 118-119). Most South African universities increasingly have to deal with large and pluralistic classes. The use of ICTs to complement traditional teaching is therefore inevitable in these circumstances as Nicaise and Crane (1999) observe, "technology may help to create reflective students and pluralistic classrooms" (p. 47). However, the use of technologies for teaching is not a panacea of all educational challenges. Careful designs of learning environments, alignment of teaching and learning outcomes, and integration into the curriculum are some of the critical success factors. Lelliot et. al., (2000) argue that "educational possibilities of ICT are constrained or enabled both by the technology and the curriculum it transmits and by the context in which it is received" (p. 42). The availability of technologies and their pervasive use among students' demand a rethink of learning and teaching strategies as Khine (2003) postulates:

> *New learning and teaching strategies may have to be introduced to prepare students to become independent learners. ICT may provide an opportunity to introduce such strategies. Through the use of technology, teachers can provide opportunities for students to learn, think critically and have discussions with peers supported by ICT* (p. 22).

While technology, curriculum and context are important, the challenge is identifying ways to effectively use the tools in ways that impact on student learning. The envisaged impact was in terms of anonymous peer to peer consultation for knowledge acquisition and the feedback to the educator based on the artefacts of student interaction. The web version of DFAQ (without SMS) was first implemented in a course in 2002 with 20 students (Ng'ambi and Hardman, 2003). The mobile DFAQ (with SMS) was first implemented in a course in 2004. We therefore report on a research project which is in its third year. The mobile DFAQ extends and builds on the web-based knowledge sharing DFAQ project (Ng'ambi and Hardman , 2004; Ng'ambi, 2002a) and question-based chat rooms project (Ng'ambi, 2002b). Other projects have focused on the analysis of DFAQ artefacts (Ng'ambi, 2002a; Ng'ambi and Hardman, 2003; Ng'ambi, 2004).

3. Case Study: Creation of knowledge resources from informal consultation

Most students had no PCs at home with internet connection and were dependent on campus computer laboratories whose access was not always practical due to time, distance and location constraints. Computer laboratories on campus are not available 24 hours/7days a week and student commute to gain access. All students had mobile phones and were competent in using SMS texting. Although the educator had set aside

consultation times (office hours when students could consult with her), the times were impractical for some students and sometimes unrealistic. For example, in 2003 one educator had set aside 2 hours in which students could consult with her, twice a week for a class of 800 students. It was in the context of the above circumstances that DFAQ was deployed to facilitate student access to knowledgeable peers for consultation and saw the potential for a knowledge sharing resource. The anonymity with which interaction is mediated in DFAQ allowed students to focus on the content of the messages rather than its source. The anonymous feature was important in allowing students with low self esteem to confidently communicate and attempt to answer questions from peers. Thus, the incorporation of anonymity in the DFAQ design was premised on the need to acknowledge diversity of the student body which includes students from previously disadvantaged social groups whose cultural histories may disadvantage them from equal levelled social interaction.

Collis and van der Wende (2002) argue that students are the main clients of the university and directly or indirectly the main source of income. Their characteristics and needs steer the University in its programs and approaches (p. 15). Mindful of both the "diverse learning needs of heterogeneous learners and the cognitive complexity of a classroom" (Ng'ambi and Hardman, 2004: p. 187), the DFAQ allowed students to ask and respond to questions anonymously. Ng'ambi and Hardman (2003) postulate that "questioning is a very useful indicator of what assistance the learner needs. As such, it is a useful learning-teaching tool for the teacher. The learner's question, then, is not only a useful pedagogical indicator of the learner's knowledge base; it is also a cognitive tool, capable of regulating mental actions" (p. 40). Thus, DFAQ is a versatile educational tool which allows students to have their questions responded to, allows the interactions (questions and responses) become a resource for all students, tracks frequencies by which questions are referenced, and provides feedback to the educator on the aspects of a course where students are struggling.

4. Description of DFAQ

When a question is posted into DFAQ two processes are automatically activated. First, the question waits is a publicly visible queue for a response. The public waiting space allows peers to read the question and where possible respond. Second, an email notification is sent to a forum manager or convenor or educator for his/her information. Although most questions are responded to by peers, occasionally questions may require an educator's response particularly course administration type of questions. Figure 1 depicts a question "Are SMS questions anonymised?" being posted to the DFAQ via SMS. The question is prefixed by a forum name (i.e. cet000) which is usually a course code. In figure 2, DFAQ sends an acknowledgement SMS to the user and additionally sends a class announcement "This DFAQ demo is for the Mobile Learning Conference".

DFAQ recognises that questions waiting in the queue may cause authors' anxiety if left unanswered for too long. In order to shorten the waiting time, DFAQ monitors the age of questions and when questions wait for thirty minutes, DFAQ assumes that forum manager may not be available to read emails and so an SMS is automatically sent to him/her. When the question is answered, it is SMSed to the question author and leaves the waiting queue to become part of the knowledge resource.

There are two ways of sending responses: if a question was authored using the web version of DFAQ, a response is emailed and for questions received via SMS the response is SMSed back. Figure 4 shows a response which the DFAQ sends to the user who posted the question via SMS.

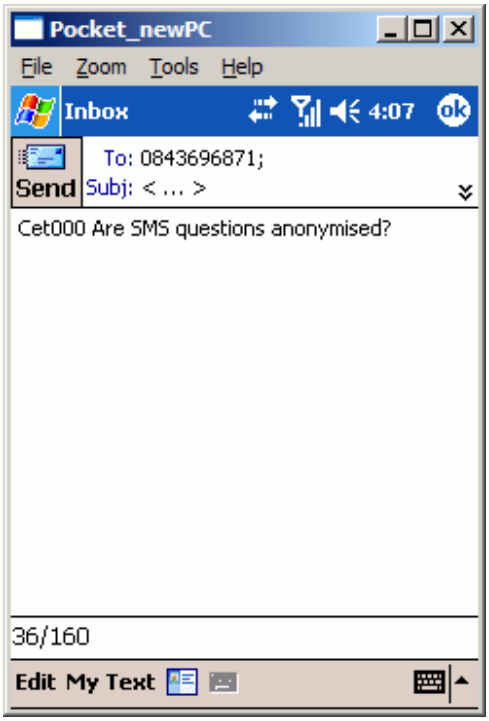

Figure 1: Posting question via SMS

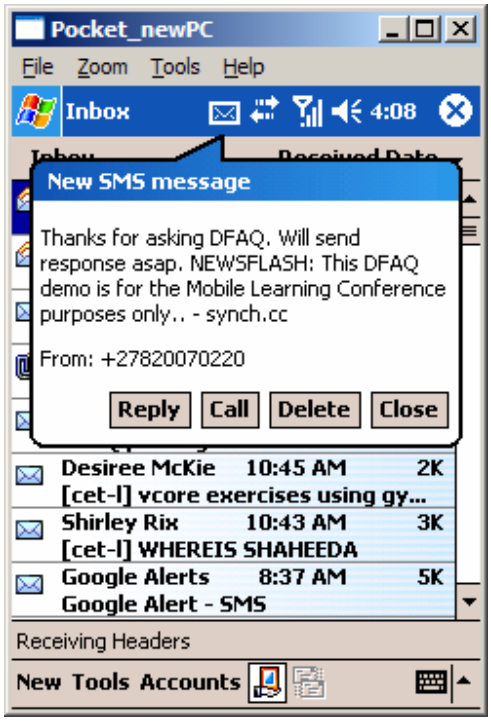

Figure 2: Receipt confirmation with newsflash appended

The features described so far are designed to benefit a knowledge seeking individual with access to either a mobile phone or the web. Ng'ambi and Brown (2004) report on other questions that this project sought to address (p. 47):

1. Can an educator provide individualised help to students at minimum cost to the educator in terms of time/effort?
2. Is it possible to increase the number of students being helped without each increment of student demanding more time and effort on the part of an educator?
3. Can student access to an educator and fellow students for academic help purposes be maximised without additional costs on part of a student?

Rather than expecting the educator to respond to all questions posted in the DFAQ environment, the making of the waiting queue public allows peers to respond to one another's questions hence creating a resource for students by students. The process of creating a resource while helping and providing support to individual students is worthwhile than attempting the creation of a resource in the hope that the resources will be used. An important feature of DFAQ is the tracking of how the knowledge resource (artefacts of interaction – questions and responses) are used by students.

There are three features that monitor resource usage:

4.1 Recently referenced questions

Questions that are recently looked-up appear on top of the list. The list also indicates when a question was last referenced. This is particularly useful in determining patterns of reference. Knowledge of the sequencing patterns is a resource for "predicting and pre-empting student questions" (Ng'ambi, 2002a).

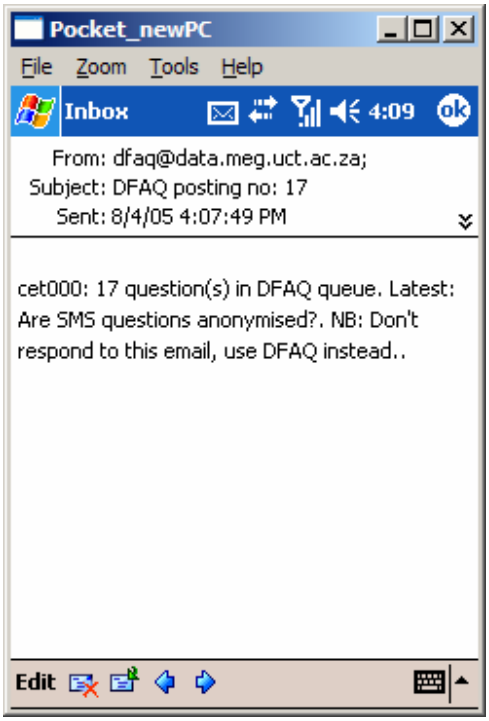

Figure 3: Lecturer notification of outstanding questions

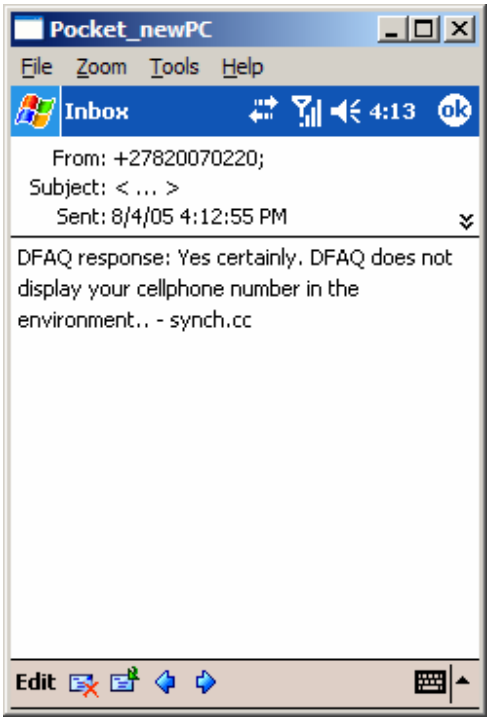

Figure 4: Response question sent Via SMS

4.2 Frequently referenced questions

Related to sequencing patterns, the frequently referenced questions indicate popularity of resources (see Figure 5). This list is premised on the argument that relevance and need for resources is dynamic in that as new knowledge is acquired, new questions arise and old questions become irrelevant or less important because answers become known. Although the relationship between knowledge acquisition and change in questioning is common sense, it is a mammoth challenge to track such behaviour. DFAQ provides a way of visually monitoring the "change in questioning as knowledge increases" (Ng'ambi, 2002b).

4.3 Frequency of response posting

Anecdotal evidence shows that few students ask questions in face to face sessions and even fewer students volunteer to respond to questions in face to face sessions. In DFAQ open ended questions may attract multiple perspectives. Belanger and Jordan (2000) observe that "learners each bring their analytical perspectives into the classroom and share their multiple perspectives in a group interactive session; the group environment can help facilitate the creation of new patterns of understanding built on the foundation of shared individual perspectives. These multiple perspectives also facilitate the process of evaluation of concepts, as learners begin to assign relative value to the individual perspectives" (p. 23). DFAQ provides a way of creating a knowledge resource from the students' multiple perspectives whereby allowing students to assign relative value to responses and the educator to monitor how preconceptions / understandings shift over time.

Both the way questions are asked and the responses they get are useful indicators of the meaning making processes and hence may expose misconceptions which, if identified early, can have ramifications on pedagogical designs and learning outcomes. It was therefore imperative that DFAQ provided anonymity of sources of questions and responses so as to shift attention away from sources of messages to message content. However, an educator may choose to respond either anonymously or may prefix a response with an educator icon to bring closure to a debate, if such an action is deemed necessary. Figure 6 depicts three responses, two anonymous and one educator prefixed response.

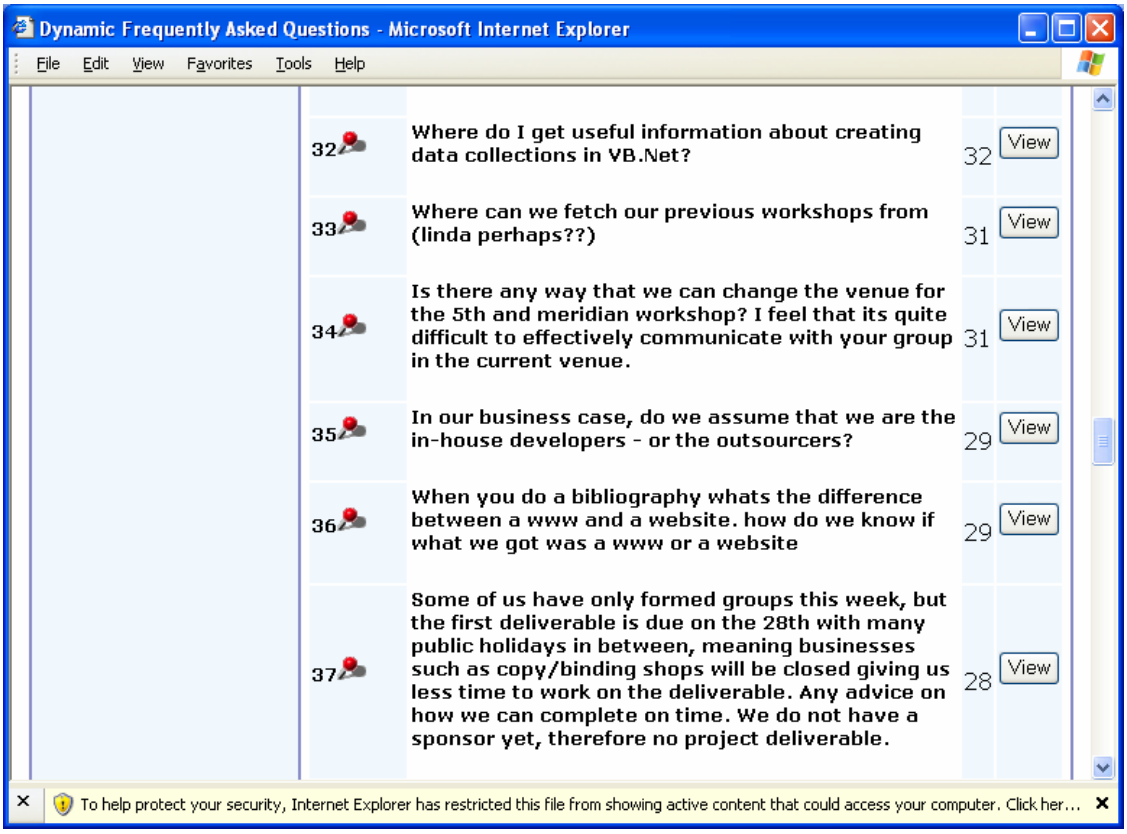

Figure 5: Frequently referenced questions

5. Observations

The experiences of students and an educator with the DFAQ were solicited through group discussions and interviews respectively. The following are some of the unedited comments:

Comment 1: "If I just look at what was absolutely amazing about this course, which I've, for me specifically, I've found at school, was if I didn't understand something, you just shut off; it's easier. Because you can just hide behind a class of twenty, you know what I mean, if you don't understand, you just keep very quiet, you know; nobody knows. Whereas, with this (DFAQ), you could actually, for me, one of my biggest learning curves was, um, looking at other people's questions. A lot of mine were answered by looking at how other people think. 'Cause you immediately get things mirrored".

Comment 2: "I realized that the whole class didn't understand. And then there was, you could just see this anxiety lifting, and it was the same with us. Once you looked at everybody else's questions, you felt freed up to actually ask, and to say to one-another, you know, what about this, and ask one-another questions, you know, and not have the fear of, I've got completely the wrong tail-end and I look completely ignorant; 'cause it's like that when you go into a class with new people".

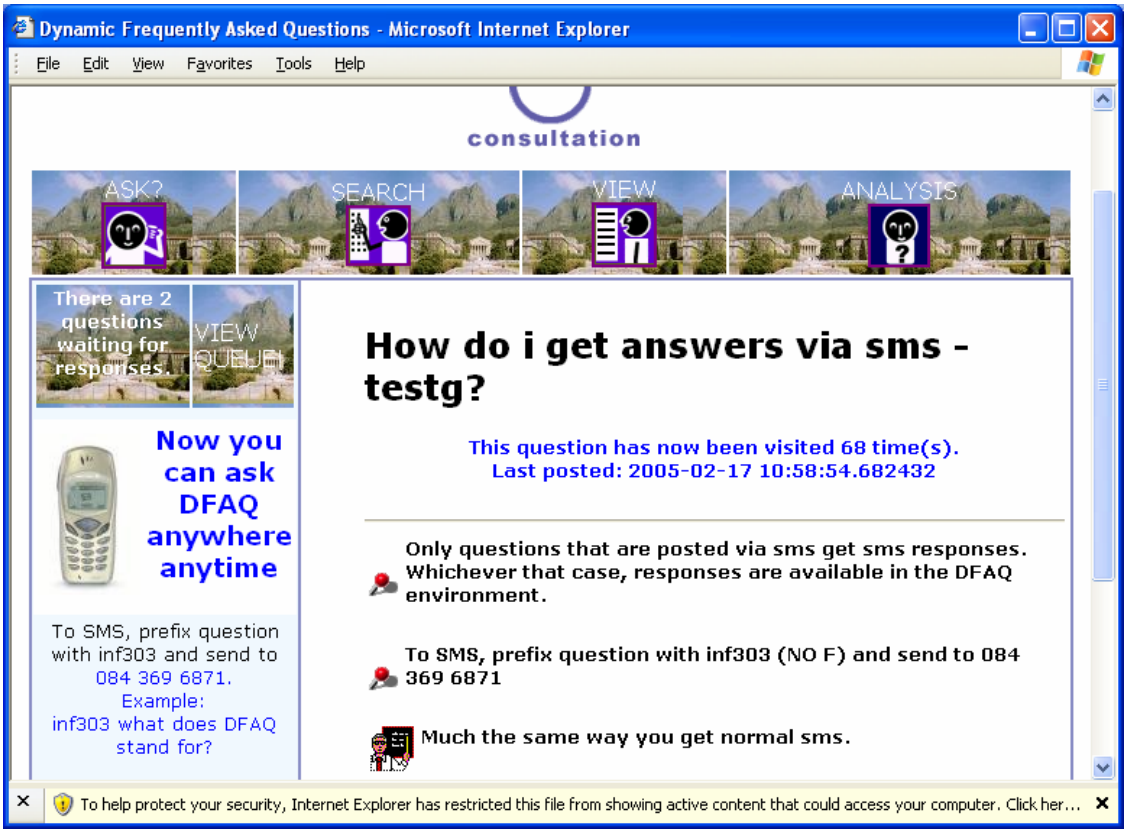

Figure 6: Anonymous response and educator pre-fixed response

Comment 3: "But this is almost like having a window on the student's brain and their development, as such. So if they login on different levels, you actually have got a window on their development; you can actually see where they're going. And it would allow you to, um, that's why I say, I can't believe we don't use it, because it would allow you to structure your lectures in such a way that you're specifically guiding it. So that you are navigating them in that you know where you're going, and you kind-of just set course and hope, you know, that they get there but this way you could actually manipulate it according to where they were going with it and according to the group; maybe you have a group that's very strong in a certain area or learns in a very specific way. So you could actually manipulate it".

Comment 4: "It's a safe environment where you've got the anchors, to go and ask questions and look at things, review things and think things through. I've found you just go to your next lecture just a little bit more mature, sort-of on the next scaffold, slightly. You just step from one phase of your development to another but more comfortably and with more confidence; as opposed to kind-of grappling".

The above reflections of students on their experience of using DFAQ focuses on the impact of being exposed to others questions as having a mirroring effect (comment 1); anonymity of interaction as having an empowering effect (comment 2); questions and responses as indicators of knowledge hence a feedback effect (comment 3); and a knowledge resources from artefacts as having a learning anchor effect (comment 4).

6. Conclusion

The paper has discussed a project in which the communicative competence of SMS texting among students is being used to address some of the educational challenges, in particular the under preparedness of

students, diversity of backgrounds, and large class sizes, at a tertiary institution. The seamless integration of the SMS and the web interface coupled with communicative competencies and anonymity has had some impact on student learning. There are four ways by which learning has been impacted: firstly, exposure to other students' questions mirrored their own understandings / misunderstandings; secondly, the anonymity created a feeling of a safe environment which empowered students to ask and respond to questions; thirdly, students were able to monitor their own growth / development through observing their own changes in the way they asked questions; fourthly, the educator received feedback on where the students learning difficulties lay and was able to quickly respond to their learning needs.

Finally, the paper has given insight on how the mobile DFAQ contributes to providing individualised help to students at a minimum cost to the educator in terms of time/effort; how the number of students being helped need not lead to an increase in time / effort on part of an educator; and how students can have access to the educator and fellow students through a shared resource, and how an educator can have access to the knowledge levels of a class.

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