

Short Paper

A Pilot Study: Can Using QR Codes Increase Student Participation in Large Classroom Settings?

Kathryn Kinyon^{1*}, DNP MSN CPNP AHN-BC, Christopher Hairfield², PhD RN, and Mohan Madiseti³, MSc

¹Assistant Professor, College of Nursing, Medical University of South Carolina, USA

²Instructor, College of Nursing, Medical University of South Carolina, USA

³Director of Research, College of Nursing, Medical University of South Carolina, USA

*Corresponding author: Dr. Kathryn Kinyon, MUSC College of Nursing 99 Jonathon Lucas Street, Charleston, SC 29425, USA

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Abstract

In large classes, students report feeling a lack of personalization and ownership for learning course material. Students can feel disengaged from the learning process, thus a greater risk of failing to seek clarification of misunderstood concepts. Given that 35-50% of persons have an introverted temperament, it is important to provide an equitable learning environment to support all students' learning. The purpose of this pilot project was to determine if the use of a QR code to ask questions would improve student engagement both during class and after class time for a first and third semester prelicensure nursing students. Post QR code survey using a 1-10 Like rt scale showed a mean satisfaction score of 8.63 for 1st semester and 7.79 for 3rd semester students. 90.7% of first semester and 76.9% of third semester students felt having access to the QR code enabled them to ask more questions.

Keywords: QR code, Large class size, Student participation, Prelicensure nursing program, Engagement

Introduction

Nursing school faculty face many challenges supporting student participation in the classroom. One challenge is identifying appropriate technologies which will enhance student participation without burdening faculty and being perceived as useless by students. This can be particularly difficult in large classes. Students in large classes have reported feeling a lack of personalization and ownership for learning course material, disengagement from the learning process, and greater risk of failing to seek clarification of misunderstood concepts [1,2]. It has been noted the use of electronic devices can be distracting and discouraged [3]. However, the use of technology can promote critical thinking and knowledge retention [4]. Quick response (QR) codes were developed over 20 years ago and are widely used in business [5]. QR code readers are readily available on portable devices and have been incorporated in patient and medical education programs. Today, QR code readers are readily available on portable devices such as cell phones and tablets. QR codes have been incorporated in patient and medical education programs, but there have been few applications of QR codes in prelicensure nursing programs [5-7]. The purpose of this paper is to describe the outcome of a pilot study at an accelerated baccalaureate nursing program (ABSN) in the Southeastern United States that applied QR code technology to improve student participation in a large classroom.

Background

Created in 1994, a QR code is a bar code which when scanned, links to a predetermined digital destination. Originally designed to improve inventory efficacy, QR codes are now part of everyday life.

The use of QR codes has been studied, however, only relative to enhancing student experiences in low fidelity simulations⁴. By using QR codes, students were able to access video and audio assessment findings. Students felt the use of a QR code enabled them to pull together assessment findings and apply to nursing care. Focusing on specific breath sounds was one innovative example where QR codes have been useful in nursing education. By using a QR code, students were able to hear and document findings in an appropriate manner [8,9]. Finally, QR codes have been used to promote Just-in-time (JIT) learning for nursing skills and understanding sexually transmitted infections (STIs) [3]. After an extensive literature search, no research was found highlighting the use of a QR to ask questions either in class or outside of class.

Ensuring all students have a voice in the classroom is essential, particularly in large class sizes. This can be especially difficult for a student who is introverted. Introversion has been defined as persons who prefer quieter, less stimulating environments. The percentage of people who fall somewhere on an introverted temperament continuum is estimated to be 35% to 50%¹⁰. This can have a significant impact on student learning and stress. Calling on an introvert student to answer questions can add to the already high stress level. By recognizing the introversion-extroversion continuum, educators can create an equitable learning environment which support all students' learning [10].

Method

This project received expedited Institutional Review Board approval. A comprehensive literature review searching for QR code

usage in nursing education found no articles discussing the use of QR codes for large classroom participants. Based on this search, a pilot project was developed to implement QR codes in first and third semester courses for undergraduate students. To determine if there was a difference between beginning students and more advanced students. The authors developed a Redcap survey to develop baseline data. Redcap pre/post surveys were kept separate though both had the same questions. The four question pre-QR code survey asked students about experience in using a QR code, comfort in raising one's hand in class to ask a question and if uncomfortable raising one's hand, how were questions answered. To determine if there was a generational difference, an age range question was added. At semester's end, a post-survey asked if students used the QR code to ask a question in class, used it outside of class, whether there was comfort in using the QR code, what was the satisfaction in using the QR code and did it lead to asking more questions. To implement the project, a QR code linked to a Redcap survey was developed. When the QR code was scanned, the student was taken to a Redcap survey, allowing the student to choose which faculty they wanted to respond to their question and then type a question. The question was immediately sent via email to the requested faculty so the faculty could respond in "real-time" during a class lecture. Students had the option to provide one's name so faculty could respond personally or remain anonymous. The QR code was also imbedded in each power point/Panopto recording so students could ask a question outside of the classroom. The QR code was printed and laminated so each student could have it available during class time.

Results

All students from both cohorts completed the pre-survey and greater than ninety-eight percent had experience using QR codes with no statistical difference between the groups. What was surprising was the percentage of students who stated they were uncomfortable raising their hand in class which was approximately 28% from both groups. Comments for first semester students were: "Sometimes I am shy," and "I feel comfortable in an online format asking questions but not in person classes." Comments from third semester students included: "Yes, social anxiety prohibits me from asking questions routinely in class, especially when we're all together again in one room!" and "I will ask a question out loud, if need be, but I'd rather not." An interesting finding was how students got questions answered. First semester students had a significantly higher dependence on course faculty either meeting after class or emails compared with third semester students who relied more on classmates for assistance. Over the course of the semester, first semester students used the QR code forty-one times while third semester students used the QR code eighteen times. While the project was designed to enable students to ask questions during class, greater than ninety-five percent of questions received were after class. For both cohorts, nearly all students chose to be anonymous. Responses to anonymous QR code questions were posted in the course announcement section of the learning management system (LMS) under the assumption if one student had a question, so would other students. Post QR code survey results showed a mean satisfaction score of 8.63 for first semester students on a 0 -10 scale with 10 being the highest and 7.79 for third semester students. Students were asked

if they felt they could ask more questions due to the use of a QR code. For both semester groups, the results were very positive at 90.7% and 76.9% for first and third semester students respectively.

Discussion

This project demonstrated the feasibility of using QR codes to improve student participation in large classroom settings. The greatest benefit appeared to be with first semester students. This finding was not unexpected as first semester students may lack confidence or have anxiety about asking questions in a large classroom⁹. However, using the QR code enabled all students to ask questions throughout the semester. This approach provided immediate feedback to faculty on areas where students struggled. Several lessons were learned during the pilot study. One was remembering to place the QR code on student desks. This was adjusted for the next semester by creating a QR code which attached to the student's badge. Since the QR code survey was anonymous, faculty could not provide a personal response. This was corrected by adding a statement to the QR code Redcap survey asking the student to provide a name if they wanted a personal email. Since the QR question went instantly to the faculty email, there was some difficulty in how frequently faculty checked emails during class. In one instance, there were several similar questions, but class time did not allow for an in-depth explanation. However, a detailed recorded explanation was posted after class.

Conclusion

Providing students with QR codes to anonymously ask questions both during and after class has the potential to promote student learning and participation by fostering an inclusive and responsive in a large classroom setting. In addition, it may decrease first semester anxiety as students adjust to a new learning environment as well as help instructors pinpoint where students are struggling with new concepts.

Conflict of Interest

The authors declare no conflict of interest.

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