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Designing Mobile Applications In The Educational Process Activity

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Abstract*: The paper presents the activities and reflective practice of mobile application design for teaching and learning, online teaching and learning of programming, and virtual learning communities to support programming learning.*

Keywords: Online education; mobile application design; programming; Application Inventor (II); virtual learning community (VTH)

Introduction

Rapidly developing mobile computing technologies and numerous mobile software programs provide ample opportunities for mobile learning anywhere. Key advances in mobile computing technologies for learning include device portability, relatively powerful computing power in small devices, and user mobility resulting from constant connectivity. These benefits lead to tremendous opportunities for innovative uses of mobile technology in education. In addition, mobile devices such as smartphones or iPod touch are becoming very popular due to their various mobile software. Apple PlayStore and AppStore and Android OS devices have millions of mobile apps for iOS devices (formerly Android Market) in more than 150 categories respectively. The innovation in mobile applications has increased the interest of teachers as it facilitates teaching and learning. However, appropriate and suitable programs are not always available; instead of testing programs, teachers can only explain them in terms of reviews or theoretical information. These reasons lead to the needs and benefits of creating your own mobile apps for teaching and learning. In addition, empowering teachers to create their own mobile applications for teaching and learning can lead to beneficial use of mobile technology that enhances student learning. For example, science teachers developing and customizing smartphone software that supports student research. However, designing educational mobile apps remains a challenge for educators without prior programming experience. In particular, the effort and time to learn to code in text-based programming languages is a daunting task for educators to develop their own programs. Some visual programming languages have been developed to solve these problems. App Inventor (AI), a web-based GFI (graphical user interface) creator by Google Inc. and the Massachusetts Institute of Technology, enables anyone with a Google account to prototype and develop Android mobile apps through its visual blocks. By examining the experiences of non-programmer educators with mobile programming in an online environment, the findings of this study help to determine the potential and value of promoting mobile applications for authentic educational purposes.

Teach and learn programming online

Among the research, resources for teaching programming online are rare. Wang explained to computer technology students about his experiences in online teaching of object-oriented programming. He noted that it is difficult for students to receive immediate feedback from instructors in an online environment, but such feedback is essential for those learning to program. He also emphasized the importance of seeing how others approach the same programming problem with their own solutions and how they collaborate with other students. Both aspects mentioned above can be difficult for teachers and students. Based on his research, he proposed three strategies for improving students' online programming learning experiences:

1) to create a virtual computer lab that allows students to immediately engage in programming activities, without having problems installing programming environment software at home or in the program.

2) adding more multimedia materials to the course, such as videos that make the instructions interesting and easy to follow;

3) create a sense of community among students that helps support each other.

A virtual learning community (VLC) to support programming learning

Learning mobile programming can be difficult for non-programmer educators, especially in an online learning environment. Thus, an effective teaching environment should create great support for these teachers. During the design process of the mobile applications considered in this study, a virtual learning community (VLC) was established to support students.

VTH refers to a social community of learners who share knowledge, values and goals. There are four important social components in VTH:

1. communication
2. cooperation,
3. interaction
4. participation.

Through active participation, students explore specific topics together, share ideas and experiences, and refine ideas to develop a deeper understanding of shared experiences. Peer support in the community greatly enhances learning in an online environment. In addition, members in a well-functioning team must develop a strong "sense of community" because of the interconnectedness, connectedness, trust, interactivity, and shared values and goals among members. This study adopted a variety of methodological strategies to help build a strong online learning community and foster a "sense of community" among learners.

Mobile application design activities and reflection practices

Each student will complete their final project by presenting one final original application based on the ideas presented in their application design proposal. Over the course of the semesters, students create customized programs for each other and then provide feedback on their own programs, design proposals, and final project programs. Students also shared resources such as web tutorials and help with programming and debugging questions. In addition to the actual design (learning by doing) and peer-to-peer (social learning) activities, students will also engage in reflective practice by maintaining software development journals about this mobile app development course on their blogs.

Learning environment, hands-on programming activities, software design suggestions, software peer review and reflective practice complement each other.

Conclusion

Designing mobile applications can significantly enhance the educational process by providing students with convenient access to learning materials, interactive exercises, and collaborative tools. This conclusion underscores the importance of leveraging technology to create engaging and effective learning experiences for students of all ages.

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