

Chapter 10

Mathematics Learning Community Flourishes in the Cellular Phone Environment

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ABSTRACT

Researchers point at the importance of nourishing learning communities, which do not merely represent congeniality but rather dig deeply into learning. These learning communities are needed in mobile learning environments. In this article, the author examines the building of a community of middle school students who learned mathematics outside the classroom by carrying out real life activities using their cellular phones. The building of the learning community was led by three 3rd year pre-service teachers majoring in mathematics and computers at Al-Qasemi Academic College of Education. The pre-service teachers worked for 12 weeks with 30 8th grade students who then learned mathematics with their cellular phones and were part of a learning community. The research shows that the use of the cellular phone for learning contributed to their learning, their identity, and their sense of community.

INTRODUCTION

This introduction addresses issues related to the topic of the reported research: mathematics mobile education and communities of learning. Talking about communities of learning, three issues will be

discussed: the definition of a community of learning, the characteristics of a community of learning, and communities of mathematics learning.

Mathematics Mobile Education

Traxler (2009) says that mobile devices, systems and technologies have a direct and tremendous

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impact on knowledge and how it is generated, transmitted, owned, valued and consumed in society. Kukulska-Hulme et al. (2009) say that mobile technologies have not only been used to support learning but also in workplace settings and for professional development. These potentialities of mobile devices and their recent increasing ubiquity amongst the younger generation, especially mobile phones, provide new possibilities, opportunities and challenges for the educational environment (Cobcroft et al., 2006), especially for math, and particularly because of the special characteristics and features of cellular phones. These include capabilities such as taking pictures, recording video and audio, transferring information, using voice and text communication, forwarding screen content to learning mates, and sending SMS (Short Message Service) text messages and MMS (Multimedia Messaging Service) messages that include multimedia objects such as images, audio, video and rich text. It is expected that in addition to the general characteristics of cellular phones, such as their availability, mobility, dynamics and accessibility, the previous features will make a difference in the learning behavior of mathematics students. What especially makes the cellular phones appropriate for mathematics learning is their ability to host mathematical midlets, mobile software programs that can be used by the student to visualize mathematical objects and relations. Furthermore, some recent studies verified the influence of the use of mobile phones on learning mathematics amongst students who major in mathematics teaching at Haifa University (Botzer & Yerushalmy, 2007; Genossar, Botzer & Yerushalmy, 2008). Genossar, Botzer and Yerushalmy (2008) studied learning processes and experiences within a mobile phone learning environment. They found that the contribution of the mobile phone environment “lies not only in making dynamic mathematical applications more available, but also in supporting the execution of tasks that are closer to the students’ experiences and more relevant to them, which has the poten-

tial to enhance experiential learning” (p. 36). In addition, the participants’ learning experiences contributed to personal learning processes, which may motivate further learning.

Regarding research which examined mathematics learning by middle school students who used the cellular phone, Baya’a and Daher (in press) examined the conditions that influenced middle school students’ learning of mathematics, when using the cellular phone, and, at the same time, the consequences of such learning. The experiment was carried out in two Arab middle schools in Israel. It was found that what affected the students’ learning in the cellular phone environment were the characteristics and technologies of the cellular phone, the requirements and topics of the mathematical activities, the learning setting (inside or outside the classroom), the intention of the researchers who participated in the teaching processes, the involvement of the school principal and the coordinating teacher. The consequences of the mathematics learning in the cellular phone environment were: the students took control of their learning, the students connected mathematics with real life phenomena, the students developed a new approach to mathematics where they looked at it as an applied science, and the students worked as mathematicians.

Regarding researches which examined the students’ perceptions of learning with cellular phones, Daher (2009) examined the perceptions of middle school students regarding the use of cellular phone midlets and web applets in learning mathematics and how they differentiate between the two tools. Daher (2009) reported that the students were aware of the following aspects of each one of the tools: its availability, its portability, its collaboration aspect, its communication aspect, the size of its interface, and its usability. The students used these aspects to describe their experience using the tools to learn mathematics, to differentiate between them, and to decide which tool they would use in their future learning and how they would use each tool. A higher percentage of students preferred

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