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# ANALYSIS OF A MOBILE LEARNING PILOT STUDY[1]

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## ABSTRACT

This article documents the results of a pilot study involving the use of mobile phones to enhance student learning. A year-long mobile initiative, identified as Bronco Mobile, was deployed at Fayetteville State University (FSU), a historically Black Institution located in North Carolina. Students were able to manage their academic and social lives using RaveGuardian, RaveAlert, RaveTransit, RaveEmail, RaveAcademics, RaveGroups, RavePolling, and RaveFlashcard--a customized package of applications developed specifically for FSU. The mobile-based applications were developed by Rave Wireless and made available to students on the Sprint/Nextel national network. The results indicate that a large percentage of the study participants found the mobile-based applications to be insignificant.

## INTRODUCTION

"Mobile computing", "mobile technologies", and "mobile learning" are common terms used to describe a growing number of college and university pilots and trails using portable, handheld, wireless devices as tools and resources (Guy and Okunbor, 2007). Traxler (2006) describes current research projects affiliated with wireless and mobile learning as 'first generation'. He further claims that these projects serve as enhancements to e-learning rather than a new form of pedagogy. In any case, educators and practitioners must investigate to understand student attitudes, new learners, and the different study patterns of all learners if we are to achieve successful outcomes with mobile learning (Kukulska-Hulme, 2006).

As the mobile learning era evolves, the vast deployment of pilots and trials seek to examine and evaluate the usability of mobile technologies to enhance learning. Traxler and Kukulska-Hulme (2005) argue that the quality of the pilots and trials will determine the deployment and sustainability of mobile learning.

North Carolina State University, College of Agriculture and Life Sciences (CALS) piloted a 2-year PDA initiative during fall semester 2002 using freshmen transition courses and field experiences. The purpose for selecting the aforementioned participants was to provide incoming freshmen an opportunity to engage in hands-on research for their first university course credit. The specific PDA used was the handheld Palm m130 together with Mobile Mentor software which afforded students the opportunity to share laboratory data from field research projects; create and edit Microsoft Word and Excel documents; and view PowerPoint slides using Documents to Go by DataViz. The hardware in conjunction with the software allowed students to: (a) access electronic copies of course files and assignment sheets pre-loaded on their devices; (b) download personal events and dates from campus-wide calendar system; (c) download copies of their resume and send to potential employers; and (d) access a built-in digital camera for taking photos around campus to documented assigned projects. At the end of the 2-year PDA mobile computing implementation, a survey was administered to 65 participants to access students' attitudes and performances with mobile technologies. CALS reported preliminary results from the PDA initiative as successful with only 3% of participants surveyed opposing the use of mobile technologies for educational purposes (CALS, 2004).

Wake Forest University piloted a program called MobileU in the fall of 2005 (Walker, 2005). Pocket PC phones were distributed to 100 students to explore educational usage for mobile technologies. Jay Dominick, chief information officer at Wake Forest suggests that student communication patterns are diverging and as a result they are less likely to engage in traditional messaging such as e-mail and more apt to embrace new technologies such as instant messaging and text messaging. The Pocket PC, a combination of a cell phone and a mobile computer with wireless access, was used for mobile messaging (i.e. instant and text messaging); mobile access to academic

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information; and voice-enabled software application which has the capabilities that allow students to use voice commands to solve life occurrences or situations. Imminent feedback from pilot participants will be used to determine whether to provide similar mobile technologies to all students in the near future.

The Office of Information Technology (OIT) at the University of Tennessee in Knoxville conducted a pilot study that included the Clicker, a personal response device. The pilot was introduced in the summer of 2005 and included approximately 1,940 participants who were enrolled in 16 classes ranging in size from 35-660. The OIT describes clickers as …..

> "portable, hand-held devices that allow students to send their responses to multiple choice, true-false, and quantitative questions wirelessly, via infra-red or radio frequency technology, to a receiver connected to the instructor's laptop computer. Software installed on the computer analyzes the data and displays the results graphically (bar graphs, pie charts, etc.), giving both students and faculty a quick idea of what concepts might need further review, additional explanation, or increased preparation." (p. 2)

A survey was administered to evaluate clicker technology and found an overall satisfaction with 47% (537) of students responding. Approximately 70% of the study participants agreed that the use of clickers: (a) contributed to their learning; (b) helped them to understand key lecture points; and (c) helped them to identify areas they needed to spend more time on. Based on study results, UT has continued its use of clicker technology to increase student engagement and support active participation in classes.

Park (2008) examined the impact of information visualization on academic content using PDAs. The study compared 3 different representations of content--traditional text, structured text without visuals, and structured text with visuals. The findings indicate a significant difference in achievement levels for learners who received the structured text with visuals compared to those who received non-visualized, text only content on PDAs.

The integration of new technologies in education is in essence a culturally driven process with the need to bring about change not only in people, but in the entire learning environment thereby researchers must provide relevant research outcomes in the field of innovative use of mobile environments to meet the needs of learners (Da Bormida, Bo, Lefrere, & Taylor, 2003).

This article will report on the findings of a mobile-based trial identified as Bronco Mobile at Fayetteville State University initiated during the 2007-2008 academic school year. Fayetteville State University (FSU) is a historically Black institution located in Fayetteville, North Carolina, and a constituent of the University System of North Carolina. It is the second-oldest public institution of higher education in the state, founded in 1867. It serves a student population of approximately 6,692 with a student body that is 72% Black, 69% female, and 95% in state. At the end of the trial, a survey was administered to participants to determine students' perceptions, attitudes, and use of the bronco mobile components.

## BRONCO MOBILE

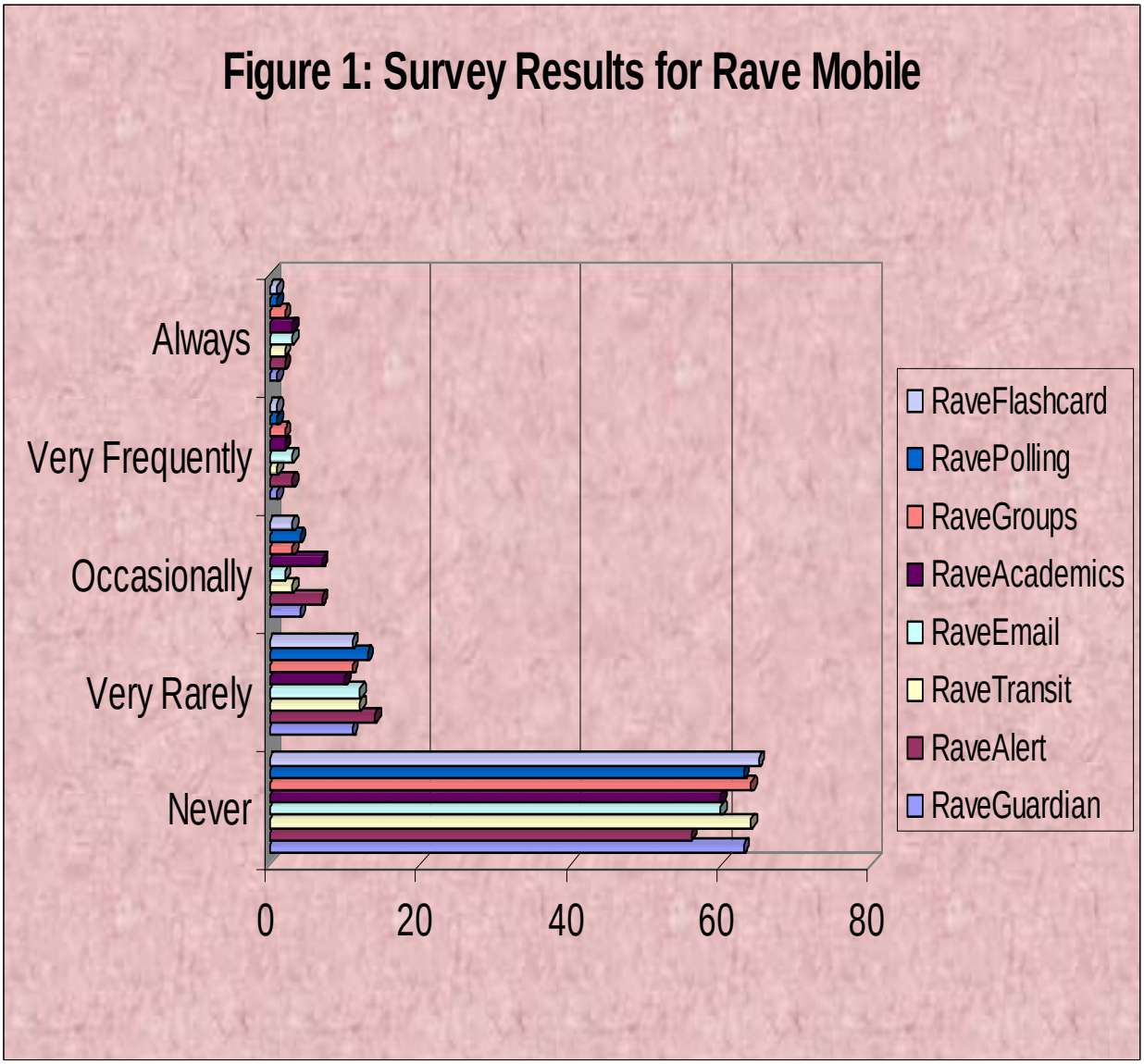
Fayetteville State University (FSU) piloted a program called Bronco Mobile during the fall 2007-2008 academic school year. Together with Rave Wireless, FSU provided students access to mobile-based academic, safety, and community applications utilizing mobile phones as an academic and community tool. All current FSU students were eligible to participate in the program; however, the one-year trial initiative was promoted a great deal in the freshmen orientation courses.

The Bronco Mobile applications powered by Rave consisted of RaveGuardian, RaveAlert, RaveTransit, RaveEmail, RaveAcademics, RaveGroups, RavePolling, and RaveFlashCard. At the end of the academic year, a survey was administered to study participants asking for students to rate their frequency use for each of the components of Bronco Mobile. A description of each application and study results are presented herein.

RaveGuardian served as a security feature for students by allowing them to share their GPS location with family, friends, and more importantly with campus police. The survey results, as presented in figure 1, shows that a large

percentage of the students (78.8) never used this component of Bronco Mobile. Additionally, only 13.8% reported using components very rarely, 5.0% reported occasional use, and 1.2% reported use as very frequently and always.

RaveAlert provided faculty and administrators with the agility to send broadcast text alerts to students. Faculty could use this application to notify students of class assignment changes while administrators could alert students to school cancellations due to inclement weather or extenuating circumstances. As presented in Figure 1, a large percentage of students (68.3) reported never using this application, 17.1% reported using very rarely, 8.5% reported occasional use while only 3.7% and 2.4% reported using RaveAlert very frequently and always, respectively.




RaveTransit served as a tracking device for campus transportation. Students were able to identify the GPS location of campus shuttle buses as well as information regarding schedules and cancellations. The survey results of this application mirrored that of RaveGuardian whereby a large percentage of students (78.0) reported that they never used the RaveTransit application, 14.6% reported using very rarely, 3.7% reported occasional use, 1.2% reported very frequent use, and 2.4% reported that they always used RaveTransit (see figure 1).

RaveEmail allowed students to access course forum archive to send e-mail messages to fellow students, instructors and administrators; to receive e-mail messages from the same; and to submit assignments by e-mail attachments, either as text-based e-mail or as Word or text assignments. As reported in figure 1, a larger percentage of students

(75.0) never used the RaveEmail application, 15.0% reported very rarely, 2.5% reported occasional use, 3.8% reported use as very frequently and always.

RaveAcademics provided mobile access to the school's learning management platform, Blackboard. Students were able to access their courses and view course assignments and announcements. Additionally, students were able to download learning content from Blackboard to include all course materials (eg. study unit, resources, content page). Similarly, a large percentage of students never used RaveAcademics (73.2), 12.2% reported using it very rarely, 8.5% reported occasional use, 2.4% reported very frequent use, and 3.7 reported that they always used this component (see figure 1).

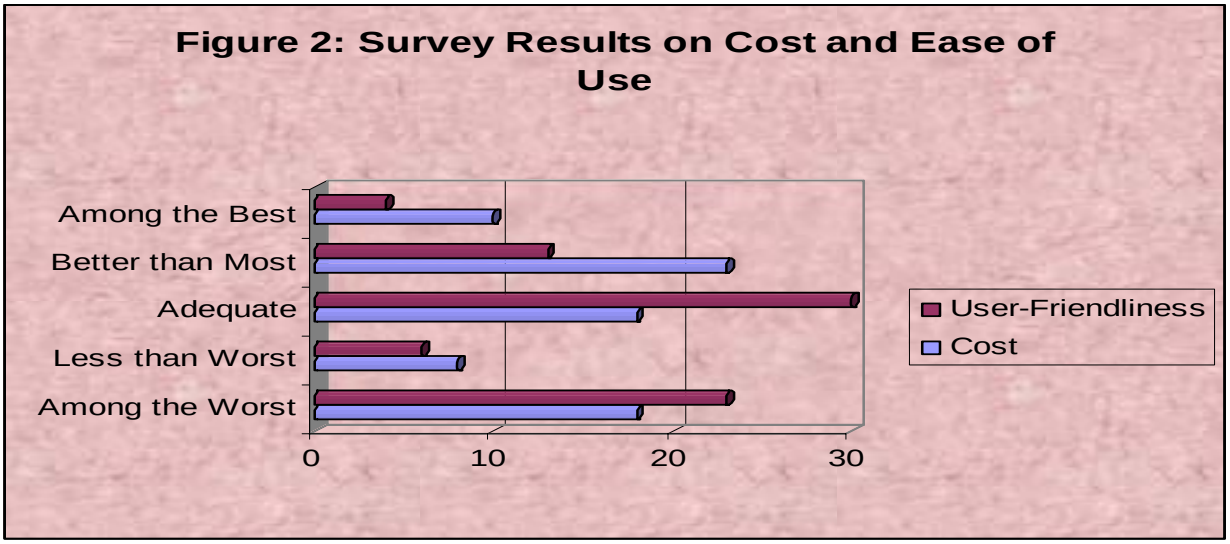
Using RaveGroups, students were able to interact with friends, clubs, organizations and teams by creating group contacts. This component allowed students to send and receive e-mails under group messaging. Figure 1 illustrates that a large percentage of students never utilized this component (78.0), 13.4% reported using it very rarely, 3.7% reported occasional use, while 2.4% reported using very frequently and always.

In an attempt to cultivate increased student involvement and on-the-go decision making, RavePolling enabled students to participate in polls as well as classroom quizzes by voting and answering questions. Students could also create their own surveys. Figure 1 shows that 76.8% reported never used RavePolling, 15.9% reported using it very rarely, 4.9% reported occasional use, while only 1.2% reported using very frequently and always.

With the RaveFlashcard application, instructors and students have the resources to create mobile flashcard sets through Web interface. The flashcards can include text and/or images using material imported from Publisher or Excel. The results as expressed in figure 1 shows that 80.2% reported never using the RaveFlashcard application, 13.6% reported very rarely use, 3.7% reported occasional use, while only 1.2% reported use as very frequently and always.

A variety of cell phones were certified to run the Rave mobile applications which included the following:

(a) Samsung M520, which features a large screen and slider functionality for reading text messages and e-mails, a built-in mega pixel camera for pictures and video, and Bluetooth compatibility.
(b) LG LX570 (Fusic II), a basic device for downloading and playing music.
(c) Motorola Q9c, a smartphone designed to access games, e-mail, and application documents such as Word, Excel, and PowerPoint. It features a full keyboard, large screen, speakerphone, and is Bluetooth compatible.
(d) HTC Mogul is designed with the same features of the Motorola Q9c with an additional built-in 2 mega pixel camera for taking pictures and viewing videos.
(e) HTC touch, a PDA device with a touch screen navigation designed to access games, e-mail, and computer applications documents. It also includes a built-in 2 mega pixel camera for taking pictures and viewing videos.




Students were asked to rate the level of ease and use of the equipment on a scale from 1 to 5 with 1 being among the worst and 5 being among the best. The results as indicated in figure 2 illustrates mixed reviews with 23.4% reporting among the worst and adequate, 10.4% reported less than most, while nearly 30% reported better than most and only 13% reported among the best.

The costs associated with the Bronco initiative included the price of the cell phones which ranged from $49.99 to $249.99 and the price of service plans which included a variation of anytime minutes for cell phone usage (see table 1), nationwide calling, unlimited free nights and weekends, unlimited text messaging, and unlimited mobile-to-mobile.

**Table 1: Bronco Mobile Phone Plans**

| 0 Anytime Minutes | 400 Anytime Minutes | 1000 Anytime Minutes | 1400 Anytime minutes | 2000 Anytime minutes |
|---|---|---|---|---|
| $39.99/month | $51.99/month | $67.99/month | $82.99/month | $99.99/month |

Students were also asked to rate the cost associated with Bronco Mobile. The findings, as presented in figure 2, point out that a large percentage of the students (39.5) felt that the cost was adequate; however, many also felt that the cost was among the worst (30.3) while 7.9% felt it was less than most, 17.1% felt it was better than most, and only 5.3% felt the cost was among the best.

In summary, nearly 70% of the study participants reported never using any of the Rave applications developed specifically for the Bronco Mobile initiative. An estimated 30% reported that the ease and use of equipment employed in this study was better than most, while nearly 40% felt as though the cost of the equipment and calling plans was adequate.

## FINAL THOUGHTS AND COMMENTS

A number of pilots and trials have been deployed in determining the suitability and sustainability of mobile education using wireless and handheld devices (CALS, 2004; Da Bormida, et al., 2003; UT OIT, 2006; Park, 2008; Walker, 2005). The results of the current study suggest that the majority of the participants found the mobile-based applications to be insignificant with a large percentage reporting having never used the applications RaveGuardian (78.8), RaveAlert (68.3), RaveTransit (78.0), RaveEmail (75.0), RaveAcademics (73.2), RaveGroups (78.0), RavePolling (76.8), and RaveFlashcard (80.2). Despite the minimal usage of the customized mobile components, the majority of the participants found the equipment certified to run the Rave mobile applications to be easy to use and priced adequately.

As we move forward with mobile education, it is important to identify and assess those strategies that will undoubtedly enhance learning. A recommendation from Traxler (2006) points to innovative lectures, exemplar content, access to a variety of wireless and mobile devices, and reliable and robust technical support as key factors that will provide continued improvement in performance and usability relating to mobile learning.

If we are to continue to engage students in the field of mobile learning, we must persist in identifying flexible models of teaching that allow students to study and learn at any time and any place. As Peters (2007) states, "m-Learning lends itself to new methods of delivery. . .. . that are highly suited to the 'just enough, just in time, and just for me' demands of 21st century learners."

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