Mobile Applications to Enhance Versatility of Mobile Learning in Higher Education

Jimmy MACHARIA

School of Science & Technology,
United States International University,
P.O Box 14634-00800 Nairobi, Kenya
Tel +254-203606299, Fax +254-2036001,
Email: Kmacharia@usiu.ac.ke
Overview

1. Introduction
2. The problem
3. Literature review
4. Materials & Methods,
5. Results
6. Discussions
7. Conclusion & Further Research
1. Introduction

✓ Rapidly increasing Opportunities due to:
  ✓ 2014 ➔ No of Mobile Phones > No of People
  ✓ Phones will reach 7.3 billion by 2014.
  ✓ Increased interest in leveraging mobile devices for learning
  ✓ improved software, and hardware,
  ✓ Evolving habits of mobile device users
    (Haag & Alexandria, 2011)
2. The Problem

M-Learning, M-Examinations:

✓ Authenticity of candidates in exam in remote sites
✓ Unreliable Internet in remote cites
✓ Flexibility in M-learning examinations
✓ Simplicity in M-learning examinations
✓ Security in M-learning examinations
3. Literature Review

1. Like it or not, ready for it or not:
   • mobile learning represents the next step in a long tradition of technology mediated teaching (Wagner, 2005).

2. Researchers have stated that:
   • the usage of mobile learning tools is an interesting area of research that is worth to be investigated (Sarrab, et al., 2013)

3. Security, authentication, authorization in M-learning and m-examinations
   • Remains a thorny issue. (Kambourakis, 2013)
4a. Materials and Methods,

Figure 1. Mobile Examination Environment Scenario
4b. Materials and Methods,

Figure 2: Mobile Phone interface of a running Mobile Exam App
4c. Materials and Methods,

- Cross sectional Survey questionnaire
- Sample size/class size - 60 students
- Multi-item constructs on a 1-7 Likart Scale
- Factor and regression analysis
### Table 1: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.933⁵</td>
<td>.871</td>
<td>.867</td>
<td>4.66475</td>
<td>.871</td>
<td>232.08</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), SL, OS, PP, EE, PE, ICT, S  
b. Dependent Variable: BIU

**predictor variables can explain 87.1% of the change/variations in Behavioral Intension to use m-Learning.**

**Durbin Watson for all variables was 2.057, which fell within acceptable limits of between 1.5 and 2.5). The results reflect that no multicollinearity exist between variables.**
5b. Results-ANOVA

Table 2: ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>35350.982</td>
<td>7</td>
<td>5050.140</td>
<td>232.085</td>
<td>.000b</td>
</tr>
<tr>
<td>Residual</td>
<td>5244.140</td>
<td>241</td>
<td>21.760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40595.122</td>
<td>248</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a. Dependent Variable: BIU
b. Predictors: (Constant), SL, OS, PP, EE, PE, ICT, S*

The significance is .000, so we can reject the null hypothesis that “The model has no predictive value.”
5c. Results - coefficients

Table 3: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95.0% Confidence Interval for B</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>t</td>
<td>Sig.</td>
<td>95.0% Confidence Interval for B</td>
<td>Collinearity Statistics</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>----</td>
<td>------</td>
<td>---------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-5.274</td>
<td>3.745</td>
<td>-1.408</td>
<td>.160</td>
<td>-12.651 to 2.103</td>
<td>Tolerance 1.013 VIF 87.865</td>
</tr>
<tr>
<td>PP</td>
<td>.014</td>
<td>.027</td>
<td>.012</td>
<td>.517</td>
<td>.606 to .066</td>
<td>.987 Tolerance 1.013 VIF 87.865</td>
</tr>
<tr>
<td>SI</td>
<td>-.283</td>
<td>.286</td>
<td>-.215</td>
<td>-.989</td>
<td>.324 to .281</td>
<td>.011 Tolerance 87.909 VIF 1.053</td>
</tr>
<tr>
<td>PE</td>
<td>.021</td>
<td>.016</td>
<td>.030</td>
<td>1.274</td>
<td>.204 to .053</td>
<td>.984 Tolerance .011 VIF 87.865</td>
</tr>
<tr>
<td>OS</td>
<td>-.054</td>
<td>.025</td>
<td>-.050</td>
<td>-2.141</td>
<td>.033 to .004</td>
<td>.972 Tolerance 1.029 VIF 1.005</td>
</tr>
<tr>
<td>ICT</td>
<td>1.084</td>
<td>.027</td>
<td>.932</td>
<td>39.939</td>
<td>.000 to 1.138</td>
<td>.985 Tolerance 1.015 VIF 87.865</td>
</tr>
<tr>
<td>EE</td>
<td>.044</td>
<td>.021</td>
<td>.048</td>
<td>2.053</td>
<td>.041 to .086</td>
<td>.995 Tolerance 1.005 VIF 87.865</td>
</tr>
<tr>
<td>SL</td>
<td>.280</td>
<td>.263</td>
<td>.231</td>
<td>1.064</td>
<td>.289 to .798</td>
<td>.011 Tolerance 87.865 VIF 87.865</td>
</tr>
</tbody>
</table>

a. Dependent Variable: BIU

The model is given by Behavioral Intention to use (BIU) m-Learning

= -5.274 + 0.044*EE + 1.084*ICT - 0.054*OS + error.

Where OS = Organizational Support, ICT = Availability of ICTs and EE = Effort Expectancy.
6a. Discussion

✓ Organizational Support (OS),
  ❑ Top management buy-in
  ❑ Budget
  ❑ Human resource development
  ❑ Mobile content

✓ Availability of ICTs (ICT)
  ❑ Infrastructure availability
    • Free – wifi
    • Free internet

✓ Effort Expectancy (EE),
  ❑ Design issues
    • Simple, flexible, friendly
6b. Discussion

✓ M-Learning readiness:
  - Students might basically be ready
  - Administrators??
  - Professors??
  - Kenyan Higher Education??

(Corbeil & Valdes-Corbeil, 2007).
7. Conclusion & Further Work

✓ Findings:

- Organizational Support (OS), Availability of ICTs (ICT) and Effort Expectancy (EE) have significant influence on BIU
- Mobile Examination using mobile applications and triggers
  - Can be made simple, flexible, secure and friendly

✓ Further Work:

- Readiness of administrators and professors
- Use of device camera and GPS to enhance security in remote examinations
- Use of larger sample across many universities and regions
Questions