Identifications of Factors Contributing to Smart Device Use as an Academic Tool among Students

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Abstract

The purpose of this study is to identify the factors which effect students' desire to use smart devices for academic purposes. This study is based on a population of 146 students in Israeli universities.

The main novelty of this study is a mediation model which helps identify factors and connections which effect the extent of smart device academic use and predicts students' motivation to use these devices.

The model shows that experience is a major factor in the extent of smart device use in the academia. Experience leads to high use evaluation indices. The manner in which students cope with problems arising during use of the devices alongside their positions regarding smart device use, lead to the goal variable - the extent of smart device academic use. The findings of this study will help in both the theoretical and applicable aspects of effective assimilation of smart devices in Israeli academia.

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1 Introduction

In the era of the information age students grow in a digital environment. Information technologies are entwined in their daily life. Smart devices such as smartphones, tablets, e-readers and palm computers are devices used by students worldwide for academic purposes.In recent years, the global academic environment has adopted mobile technology. Apart from improving their technology infrastructure for better accessibility, the universities are acting for better integration of mobile technology into courses. Many institutions have adjusted their academic contents to small screen sizes and have improved the network speed. Furthermore, many universities are preparing to make the transition from printed textbooks to digital textbooks and are developing various mobile learning based courses. Keller (Keller, 2011) reported that in American campuses the number of students who used mobile devices daily to access the Internet significantly increased annually.

Previous studies have examined students' attitudes towards the academic use of smart devices (Morris & Higgins, 2011; Nus, 2012; Chen, 2013; Belman, Potter, Treleaven-Hassard, Robinson &Varan, 2011; Namsu and Hyunjoo , 2012). All found that while the devices are accepted favorably by most, some still have difficulties with these devices and many improvements are still in order.

Examination of the theoretical background reveals that academic use of smart devices is a result of experience with the device and perceptions of the device as manifested in the barriers to use and ease of use, alongside the way of coping with difficulties which arise while studying with a smart device. Various studies emphasize the importance of the attitudes towards the academic use of smart device. These factors lead to the preference of the smart device as an academic tool and to the scope of use for academic purposes. Based on the theoretical background and the recommendation of the researchers, a research model was created, named the path model. See figure 1.
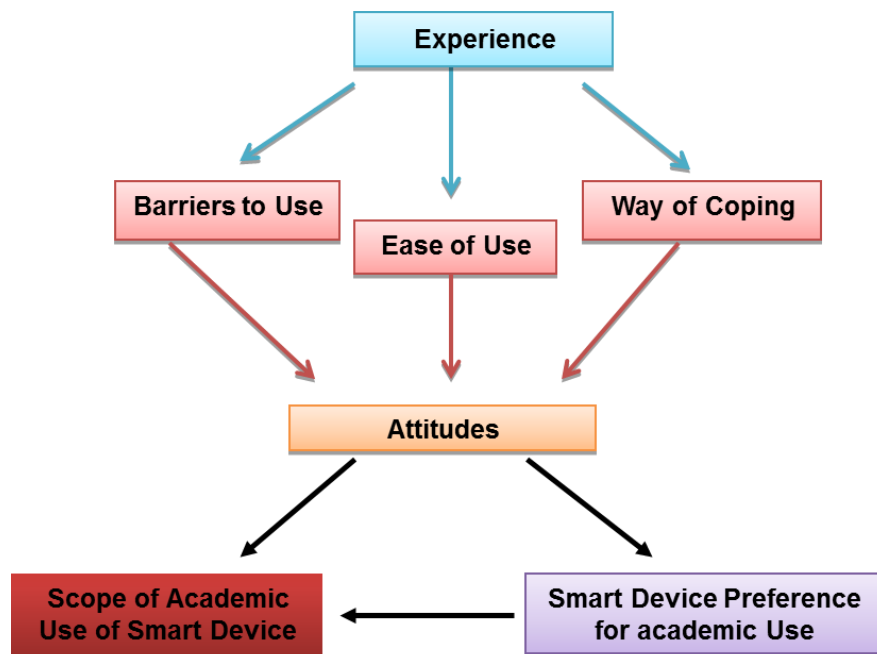
Figure 1. Research framework- the path model

In order to examine the fit of the model researchers used the Amos 20 program, which examines the fit of the model to the relations between the research variables. For our tested model there are four parameters, the first two parameters relate to correlations between the model and the first indexes: CFI and NFI. The Normed Fit Index (NFI) is the difference between the two models' chi-squares divided by the chi-square for the independence model. The Comparative Fit Index (CFI) uses a similar approach (with a no central chi-square) and is said to be a good index for use even with small samples. It ranges from 0 to 1. For these two parameters values of .90 or higher indicate a good fit.

The other two parameters relate to the distance between the model and the first variables: Chi-square and VMSEA. VMSEA should be less than .05 and Chi-square should be insignificant. The analysis of the current model initially indicated a good fit based on the various parameters. NFI=.79, CFI=.87, χ^2=47.37, p<.01 and VMSEA=.09.

The Amos program pointed to possible improvements of the model, by which there is a need to find a direct, rather than indirect, connection between the experience variable and scope of academic use and a direct connection between the Barriers to Use variable and scope of academic use, as well. These changes were adopted and a model which fulfils the requirements of the quality of compatibility was obtained NFI=.93, CFI=.96, χ^2=16.70, p>.05 and VMSEA=.01. See figure 2.
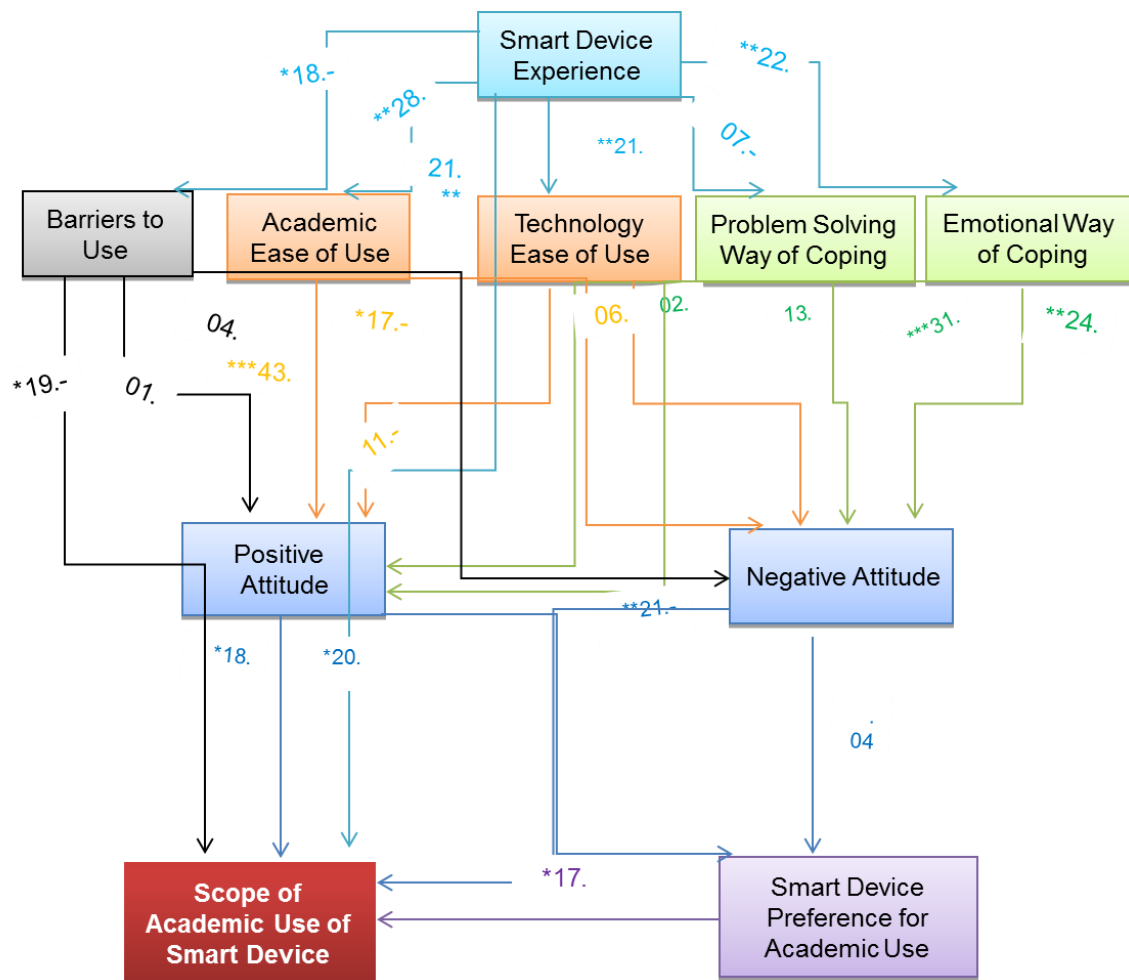
Figure 2. Research model- the path model

2 Findings

As the model indicates, **five variables** contribute directly to the variance of the Scope of Academic Use: Experience, Barriers to Use, Attitudes and Smart Device Preference. The β coefficients were positive towards Experience, Positive Attitudes and Smart Device Preference and were negative towards Barriers to Use and Negative Attitudes. In other words, the more experience the students have and the more positive the attitudes and the preference for a smart device and the less the barriers to use and the less the negative attitudes, thus the scope of academic use of the smart device is greater.

Amongst these variables, the Positive Attitudes mediate between Academic Ease of Use and Emotional Coping and the Scope of Academic Use. In fact, Emotional Coping mediates through both Positive and Negative Attitudes: meaning, the more the students cope emotionally the more negative the attitudes, and the more negative the attitudes, the lower the scope of academic use of smart devices.

Concerning the Positive Attitudes, there is a direct contribution to the objective variable: the Scope of Academic Use; Hence, the more positive the attitude the higher the scope of academic use. Furthermore, the model reveals that the Positive Attitudes also indirectly contribute to the Scope of Academic use via the mediation of Smart Device Preference: The more positive the attitudes, the higher the preference towards smart device for academic use and the higher the preference the greater the scope of academic use.

These findings indicate that mainly the Attitudes and, slightly less, the Smart Device Preference meditates between Barriers to Use, Ease of Use, Way of Coping and the Scope of Academic Use of Smart Devices.

3 Discussion

Research pathway analysis enables insight into The Scope of Academic Use of Smart Device. The research Model provides clear representation of direct and indirect effects of the various variables on the objective variable the Scope of Academic Use of Smart device. The picture that arises from the findings displays a clear correlation between Smart Device Experience, perceived Barriers to Use, technological and academic Ease of Use, Emotional Coping and Attitudes towards Preference of a Smart Device and The Scope of Academic Use. This indicates that enhancing smart device experience may lead to higher positive attitudes towards academic use of smart devices and may significantly enhance the preference of device and increase smart device academic use.

Research path analyses show **direct influence** of the variables: Experience, Barriers to Use, Positive and Negative Attitudes and Smart Device Preference on the objective variable. This indicates that high academic use will be made by the more experienced students who perceive the Barriers to Use less or have positive attitudes. Also, students who prefer a smart device will make more academic use.

Path analyses also present the indirect effect of the mediating variables on the objective variable. Among the mediating variables the importance of the students' attitudes arises. The Positive attitudes mediate between academic ease of use and emotional coping and the scope of academic use. In fact, emotional coping mediates via the positive and the negative attitudes, so that the more the students cope emotionally the more negative their attitudes and the more negative the attitudes the less the academic use of the smart devices. The model also indicates the indirect effect of positive attitudes on the scope of use via the mediation of the smart device preference, so that the more positive the attitudes, the higher the preference for smart device and the higher the preference the greater the academic use of smart device.

The findings of the model analysis indicate that smart device experience is a crucial factor for high academic use of smart devices. Smart device experience leads to the students' perception of smart device Ease of Use and Barriers of Use, and to students' ways of coping (emotional and problem solving). Students' attitudes (negative & positive) and slightly less the smart device preference mediates between these factors and the objective variable academic use of smart device.

4 References

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