

# Big 5 Personality Traits Affect M-Learning Preferences in Different Contexts and Cultures

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*Abstract – The Big Five Personality traits are considered by some psychologists to well describe human personality. The five traits or factors are openness, conscientiousness, extraversion, agreeableness, and emotional-stability. It appears highly plausible that human personality affects preferences for learning, and that this will be modified depending on context and cultures. In this paper we investigate mobile learning (m-learning) in two cultures (Australian and Saudi), and in two dimensional context model we have constructed. Our two dimensions are physical space and social space. We show that two factors (emotional-stability and agreeableness) of Big 5 as measured do affect m-learning preferences, and that these preferences are local to specific contexts as well as occasionally spanning contexts.*

*Keywords – Personality traits; m-learning context; m-learning preference; m-learning podcast; personalize m-learning.*

## I. INTRODUCTION

The swift growth of mobile devices and wireless networks has smoothed society access from anywhere and everywhere. Mobile devices such as (tablet, Smart phones, cellular phones) have altered the people way of connectivity. The total of mobile broadband subscribers is about 2.1 and mobile subscribers is about 7 billion and for 2013 [1]. This uprising has shifted E-Learning to M-Learning.

M-Learning is “any educational provision where the sole or dominant technology is a handheld or palmtop device” [2]. M-learning has been clarified as a new era of digital learning [3]. While [4] have considered M-learning as an advanced model following e-learning. This feature enable M-learning to overcome the boundaries of learning time and space. Thus, learning materials (e.g. podcasts, reading) could be delivered anywhere and anytime for mobile learners.

Popular learning materials (podcasting) can be delivered to M-learning are video, text (e.g. PDF, E-books), and audio. Podcasting support the communication between lecturers and students. Podcasts are defined as “digital files that can be delivered automatically to a device such as a portable media player or a computer via the Internet.” [5].

Up to now there is only one research which has clearly classified podcast’s intervals [6]. The authors of this research have used podcasts in blended learning at Minho University, where they have classified podcasts’ intervals as short, moderate, and long. In minutes, short ranges from 1-5, moderate from 6-15 and long more than 15. However, it is highly recommended to have short podcast length. Another study has been done by [7] whose experiments show that computer science students did not listen to any podcasts having a span of longer than 8 minutes. They numerate a number of advantages which have been collected from students and lecturers quantitatively and qualitatively. From students’ perception, short format highlights the information, assist study process, extends and personalized learning, and assists <sup>assessments</sup> preparation. On the other hand, from lecturers’ perceptions, concise and learning with reinforcement increases students’ interest. Both lecturers and students agreed that short format of podcasts save consultation time.

Former studies indicated conflicts on students’ preferences among podcast types, traditional studies, and notes [4, 8-12] as these studies could be categorized into three forms which are contrast studies among podcast types, contrast studies between traditional study and podcasting, and contrast studies between podcast in general with notes. [8] disseminate podcast lectures which have three different types (audio synced with PowerPoint slides (PPT), video, and audio) where students preferred unadulterated audio among the other type of podcasts. Similarly, [13] have indicated that although video has potential advantages for learners, audio is more popular compared with video. Furthermore, video and audio podcasts have been distributed into four different courses [9], where the number of downloaded audio is higher compared with video podcasts. However, in the same study students show that the most preferable type is video followed by traditional notes followed by audio podcast. Copley [9] highlight that in various educational context audio synced with PPT is more important than a video podcasts (e.g. a lecture has been recorded). [10] have collected data from surveying

undergraduates and have a encouraging vision on podcasting, but a significant preference for notes compared with podcast. In contrast, [12] collected the students ranking of podcasts compared to (textbooks and notes) students show that audio podcasts is more effective, efficient and approachable compared with (textbooks and notes). A study in [11] has generated downloadable podcasts for students and concluded that students prefer traditional studies rather than podcasting. The study goes further and demonstrates that podcast is not for everyone and some students are not eager for podcasts. Based on that, there is a gap to investigate mobile learners' preferences for all podcast types (audio, video, text synced with audio, and text). This is vital as implying of all possible types in a study resulted on unbiased investigation. Moreover, this study emphasize that the preference towards podcast types (text, audio, text synced with audio, and video) is based on context.

Many researches reflect limited or one environment (e.g. field around a school [4], museum [14]) and this is comprehensible because of the study natural. However, our study emphasize that the central value of M-Learning is mobility [15, 16]. Consequently, our study reflect two main notions which are mobility in physical space and mobility in social space.

Mobility in physical space and social space are one of the fundamentals outcomes of unpacking mobile from mobile learning [17]. Mobility in physical space is that mobile learner is moving from place to another and cram learning in gaps of daily life, whereas mobility in social space is mobile learner encounter social events such as being with family members and/or friends. Additionally, Mobility in physical and social space are overlapping, for instance, mobile learner is being in busy setting such as a café with a family member. Subsequently, to the best of our knowledge, no study have consider the effect of mobility in social and physical space on m-learning preferences.

Mobility in social space has diverse set of attribute values (CompanionType) based on the study purpose. For instance, [18] have involved (alone, girlfriend/boyfriend, friend, coworkers, family, and others) as attribute values of companion to have recommendation process to watch a movie. Another case, [19] have set values for companion attribute as (boss, colleague, family member, and unknown) as social relation between caller and receiver to assist telephony on context aware systems. Thus, our study have included companion type as (alone, family, friend, and classmate). Then again, the attribute values of mobility in physical space (EnvironmentType) are quiet, busy, and moving environments. These environments (quiet, busy, and moving) as stated previously are overlapping with the concept of mobility in social space. Thus, this paper examine the effect of companion type and environment type on mobile learner preferences into two different cultures (Australian and Saudis).

Moreover, this paper has utilized big five personality traits to personalize mobile learners' preferences. As big five provide comprehensive understanding of personality. Big five is widely known for organizing human personality into five factors. In

more details, the five factors provide a broad level of personality. The big five factors are: openness, agreeableness, Conscientiousness, Extraversion, and emotional-stability. For more details, each dimension has been explained in table II.

TABLE I. THE BIG FIVE PERSONALITY FACTORS, SOURCE: ADAPTED FROM [20].

Trait Dimension	Endpoints of the dimensions
Emotional stability	Calm vs anxious Secure vs insecure Self-satisfied vs self-pitying
Extraversion	Sociable vs retiring Fun-loving vs sober Affectionate vs reserved
Openness	Imaginative vs practical Preference for variety vs preference for routine Independent vs conforming
Agreeableness	Soft-hearted vs ruthless Trusting vs suspicious Helpful vs uncooperative Disciplined vs impulsive
Conscientiousness	Organized vs disorganized Careful vs careless Disciplined vs impulsive

TABLE II. THE RESULTS OF ENVIRONMENT AND COMPANION OVERLAPPING, WHERE MOBILE LEARNERS HAVE BEEN ASKED FOR EACH COMBINATION CONTEXT ON THEIR PREFERENCE OF PODCAST TYPES.

Context	Companion Attributes			
	Alone	Family	Friend	Classmate
Quiet	Quiet and alone	N/A	N/A	N/A
Busy (e.g. Café)	Being alone in busy context	Being with family in busy context	Being with friend in busy context	Being with classmate in busy context
Moving case 1 (e.g. Walking)	Being alone in walking context	Being with family in walking context	Being with friend in walking context	Being with classmate in walking context
Moving case 2 (e.g. Vehicle)	N/A	Being with family on car context	Being with friend on car context	Being with classmate on car context

## II. METHOD

### A Subjects

The subjects for this part of the research are university students from Australia and Saudi Arabia. A total of 700 surveys have been distributed, where 345 response have been received (126 Australian 219 Saudis).

### B M-Learning preferences questionnaire

The students' preferences questionnaire has Arabic and English versions as data will be collected from Australian students and Saudi students. The questionnaire evaluate students' preferences of using mobile devices for formal education. Preferences' of podcast type (text, audio, video,

and PPT synced with audio) and podcast length (1-5, 6-15, >15) minutes have been structured based on environments (busy context, quiet context, and moving context), and companion (alone, friend, classmate, family member) Please refer to table I.

### C Personality traits

Both Australians and Saudis students have completed Big Five Inventory (BFI-44 [20]). The survey consist of 44 items as self-reported which has five point Likert scale to measure big five dimensions. This has been widely used in personality research as it show superb psychometric properties.

### D Statistical analysis

SPSS version 23 has been used to analyze data. A Spearman's rank-order correlation was run to assess the relationship between preference length of podcast type and the score big 5 personality traits.

## III. RESULTS

A Spearman's correlation has been conducted to see the correlation between m-learning preferences in different contexts and Big five personality types for two different cultures, please refer to table III for Australian students, and table IV for Saudi students.

TABLE III. CORRELATION IN DIFFERENT CONTEXT FOR M-LEARNING PREFERENCES AND BIG FIVE FOR AUSTRALIAN CONTEXT.

	The Big Five personality factors				
	extraversion	agreeableness	conscientiousness	Emotional stability	openness
Quiet & Alone		Text--			
Busy & Alone					
Busy with family					
Busy & Friend				Video--	
Busy with Classmate					
Walking alone					
Walking with family				Video-	
Walking & Friend		Text-		Audio-Video-	
Walking & Classmate					
Vehicle with family					
Vehicle with friend				PPT-Text-	
Vehicle with					

classmate					
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TABLE IV. CORRELATION IN DIFFERENT CONTEXT FOR M-LEARNING PREFERENCES AND BIG FIVE FOR SAUDI CONTEXT.

	The Big Five personality factors				
	extraversion	agreeableness	conscientiousness	Emotional stability	openness
Quiet & Alone			PPT+	PPT+	Audio+
Busy & Alone					
Busy with family		PPT-Text-	PPT-		
Busy & Friend					
Busy with Classmate					
Walking alone					
Walking with family		Audio-Video-			
Walking & Friend		Audio--Video--PPT-Text--	Video-		
Walking & Classmate		Audio-Text-			
Vehicle with family					
Vehicle with friend		Audio-Video-PPT-Text-			
Vehicle with classmate		Audio-Video-Text-			

## IV. DISCUSSION

### A Australian context

The Australian population shows different attitudes towards m-learning, depending on personality type; but this section will focus on the *Emotional-Stability* type, as this type has a significant correlation in certain circumstances. As shown in Table I, mobile learners with a high score in the *Emotional-Stability* type indicate high steadiness under stressful situations, and remain poised, calm, and sensible. Mobile learners with a high score in *Emotional-Stability* tend to have a negative correlation with using m-learning, if they are in the company of family and friends. As shown in Table III, a significant negative correlation appears with using video learning materials, while in company with a friend in a busy situation. Moreover, video and audio are not preferred, either while in the company of others or when moving, for example, while walking or riding in a vehicle. Consequently, Australian mobile learners with a high score of *Emotional-Stability* enjoy their time with family and friends without the distraction of m-learning. This type welcomes m-

learning material delivery while they are alone or with a classmate.

### B Saudi context

Significant positive and negative correlations can be seen for m-learning among the so-called big five traits in the Saudi population. However, it is observable that *Agreeableness* has a significant correlation in a number of situations. *Agreeableness*, as shown in Table I, shows the degree of general concern for social harmony. Mobile learners with a high score in *Agreeableness* are helpful, promote compromise to make peace, and are empathetic.

Mobile learners with a high score in *Agreeableness* have a negative correlation with using m-learning when they are in the company of family, friends, or a classmate. As shown in Table IV, a significant negative correlation appears with using audio and video learning materials, while with family members in a moving situation, such as walking. In the same way, this type prefers no podcast type while they are with friends; in addition, they do not prefer texting when with a classmate. While in a vehicle, mobile learners with a high *Agreeableness* score do not want to receive m-learning materials while friends, family, or classmates are around.

In conclusion, Saudi mobile learners with a high score of *Agreeableness* tend to value having friendly and warm meetings, even with more formal company such as classmates. This type welcomes m-learning materials to be delivered only while they are alone.

### C Are there any commonalities between the high Emotional-Stability and high Agreeableness types?

Although *Emotional-Stability* and *Agreeableness* types both enjoy time while in the company of others, we cannot conclude that they are not utilizing their time study compared with other traits. In fact, both types show a strong positive correlation with *Conscientiousness* (please refer Table V). Mobile learners with high scores in *Conscientiousness* are very organized, conscientious and goal-directed. Moreover, in second position in terms of positive correlation, *Emotional-Stability* and *Agreeableness* strongly correlate towards each other (please refer to Table V). Accordingly, both traits are strongly correlated to *Conscientiousness*, and they are both correlated to each other.

TABLE V. CORRELATION AMONG BIG FIVE FACTORS.

Correlation	Emotional stability	Agreeableness
Conscientiousness	.405	.375
Emotional stability	1	.271
Agreeableness	.271	1
Openness	.180	.258
Extraversion	.199	.144

## V. CONCLUSION AND FUTURE SCOPE

Our research has investigated m-learning preferences in different cultures and contexts, and personalized m-learning preferences utilizing Big Five. The study has shown that association between personality traits and m-learning

preference exists especially for emotional-stability and agreeableness traits. However, a number of limitations need to be considered. For instance, Big Five traits are not strongly related to the designed survey. In more details, asking mobile learner to select audio, text, or video do not directly match different personality traits. However, such research shows general attitude toward a certain context. More research is needed to better understand m-learning preferences by expanding the designed context, utilizing learning styles, conducting lab or field studies, and developing learning materials. For example, it is clear that current podcast types are not suited for social environment. It is possible that we could develop learning materials which people with high agreeableness and emotional-stability will be willing to use while in company.

### ACKNOWLEDGEMENT

The authors thank (Abdullah Alsedrani, Ashleigh Dempster, Chris Chow, Leana Copeland, and Norah Al-Ismael) who helped on data collection for this project.

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