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Education Excellence and Innovation Management through Vision 2020

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## Table of Content

Optimization of Civil Catering Service in Crisis Conditions with Nutritional Evaluation of the Pre-Prepared Food Preparation Plan..... <i>Helena Velichová, Eva Lukášková, František Buňka, Kateřina Pitrová and Dušan Vičar</i>	1
The Relationship between Trust, Integrity and Community Happiness..... <i>Abd Rahman Ahmad, Tareq Jumuaa Al Junaibi, Ng Kim Soon, Hairul Rizad Md Sapry and Siti Sarah Omar</i>	11
The Relationship between Information Sharing and Student's Academic Performance: Evidence from Al Imam Mohammad Ibn Saud Islamic University..... <i>Bilal Ahmad Ali Al-khateeb</i>	16
Upin & Ipin: Language Style for Children's TV Series..... <i>Nor'Anira HARIS</i>	29
Organizational Justice and Altruism: Does Po Fit Suitable as Moderator..... <i>Farika CHANDRASARI, Majang Palupi, Zainal Mustafa EQ, Heru Kurnianto Tjahjono and Wisnu Prajogo</i>	39
Implications of Lifelong Learning for the Development of Silver Economy in Poland and Spain..... <i>Ewa SOBOLEWSKA-PONIEDZIAŁEK</i>	50
Alternative culture with special focus on post-hippies/post-underground in the Czech Republic..... <i>Michal Trousil and Blanka Klímová</i>	59
Economic Feasibility Analysis in Aquaponics..... <i>Constanta Laura AUGUSTIN (ZUGRAVU), Ciprian Petrisor PLENOVICI, Camelia FASOLA (LUNGEANU), Maria Magdalena TUREK RAHOVEANU and Gheorghe Adrian ZUGRAVU</i>	63
Comparative Analysis of the Use of Neural Network Technology in the World and Russia..... <i>Alexey V. Bataev, Alexandr A. Gorovoy and Zaborovskii Denis</i>	70
Evaluation of Neural Network Technology in the Financial Sector..... <i>Alexey V. Bataev, Alexandr A. Gorovoy and Zaborovskii Denis</i>	82
Digital Transformation as a Key to Increasing the Competitiveness of the Russian Chemical Industry..... <i>Alexey G. KORYAKOV and Oleg I. ZHEMERIKIN</i>	96
The Role of Human Resource Management in the Learning Organization: An Empirical Study of Public Sector in the Kingdom of Bahrain..... <i>Adel Ismail Al –Alawi and Captain Zain Abdulla Alshomali</i>	104
Employees' Compensation and Labour Productivity in Nigeria: Empirical Insights from Auto Regressive Distributed Lag Technique..... <i>Olufunmilayo T. AFOLAYAN and Henry OKODUA and Hassan OAIKHENAN</i>	118
Examining Interactional Justice and Employees' Engagement in Nigeria's Port Industry..... <i>Young J. WARIBO, Dayo I. AKINTAYO, Omotayo A. OSINBANJO, Olayunji I. FADEYI and Ayodotun S. IBIDUNNI</i>	132
Global Identification: The Cloud Passport..... <i>Yuk-Tung 'Tonnie' LAM and Peter BUSCH</i>	138
Data Mining for Higher Education Fundraising..... <i>Agatha ALBANO and Peter BUSCH</i>	154

*Intan Fitri PERMATASARI, Haula ROSDIANA and Lucas Filberto SARDJONO*

Selected Programs to Support Sustainable Buildings in Austria, Czech Republic and Germany - Inspiration for Slovak Republic.....	7556
<i>Julius GOLEJ and Miroslav PANIK</i>	
Conceptual Model of Formation of System Engineering Competence: Essence and Didactic Instrumentation	7570
<i>Elena GODLEVSKAYA, Valeriy LIKHOLETOV and Sergei ALIUKOV</i>	
Does Aircraft Leasing Strategy Increase Airline Performance?.....	7579
<i>Triesandi Aditya RAHMAN and Zuliani DALIMUNTHE</i>	
Staged Financing: Case Study Indonesian's Start-ups.. . . . .	7588
<i>Widi SENALASARI, Zuliani DALIMUNTHE and Rachmadi Agus TRIONO</i>	
Insurance Premium Subsidies in Crop Farming: Challenges and Opportunities.. . . . .	7594
<i>Vladimir NOSOV</i>	
Study on Innovation Economy in German Mittelstand.. . . . .	7601
<i>Jan KIEHNE, Marieta OLARU, Ann-Kathrin ARP and Astrid FORTMÜLLER</i>	
The Ukraine's Agri-food Export Performance in the Context of Competitiveness.. . . . .	7613
<i>Oleksandr O. SHKOLNYI, Nataliia O. VERNIUK, Lidia V. KLYMENKO, Nina Y. PITEL, Maryna O. GOMENIUK and Oksana ZAGORODNIUK</i>	
Operations Management Strategies for the Textile-Clothing Sector in Colombia.. . . . .	7620
<i>Jose Alejandro CANO and Abdul ZULUAGA-MAZO</i>	
Assessing an Innovative Way of Teaching Econometrics.. . . . .	7626
<i>Andreea MIRICĂ, Teodor Emanuel PETREANU and Ionela-Roxana GLĂVAN</i>	
Approaching Econometrics as a Serious Game in Order To Provide Professional and Soft Skills to Undergraduate Students.....	7634
<i>Tudorel ANDREI, Andreea MIRICĂ and Teodor Emanuel PETREANU</i>	
Students' Adoption of Mobile Learning: An Investigation in Indonesia Higher Education.. . . . .	7641
<i>Faisal SYAFAR, Darlan SIDIK and Halimah HUSAIN</i>	
Data and Information Quality Framework Development: Proposed for Indonesia Higher Education.. . . . .	7648
<i>Halimah HUSAIN, Faisal SYAFAR, Edy SABARA and Sofyan SYAFAR</i>	
Continuing Education in the Context of Global Trends.. . . . .	7654
<i>Lyudmila A. ABRAMOVA, Olga A. IVANOVA, Svetlana B. VERESHCHAK and Inna B. GETSKINA</i>	
The Degradation of Intellectual and Creative Human Capital as The Factor for Deterioration of the Economy Competitivity in Omsk Region.....	7660
<i>Dmitry RUDAKOV, Gulnur AKHMETOVA, Dmitry CHERNYAVSKY, Michael MAKOVETSKY, Elena KOBERNIK and Nikita BOGOMOLOV</i>	
Theoretical Bases of Monitoring in the Process of Management of Sustainable Development of the Enterprise.....	7674
<i>Inna Kuznetsova, Maryna Baldzhy, Iryna Vidomenko, Juliia Karpenko and Olga Balabash</i>	
Políticas públicas para la inclusión sociolaboral de personas con discapacidad intelectual: el caso de las universidades inclusivas.. . . . .	7685

## **Students' Adoption of Mobile Learning: An Investigation in Indonesia Higher Education**

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### **Abstract**

Mostly, mobile technologies are adopted and used without critical examination of how they help students learn. Nowadays, mobile learning (m-learning) becomes principally imperative challenge for the contemporary higher education management. The aim of this study therefore, is to explore requirements that could influence the students' adoption of m-learning. By employing The Unified Theory of Acceptance and Use of Technology (UTAUT) and two other potential factors, which are perceived playfulness and self-management of learning, an empirical based framework will be developed to identify adoption requirements of mobile learning. This study involves the university students of Universitas Negeri Makassar as respondents using both email and online-based questionnaire. It is expected that this study will be providing both a theoretical and practical contributions for m-learning adoption and should be of interest to both researchers and practitioners across higher education sectors, particularly in Indonesia.

**Keywords:** Students adoption, Mobile learning, Higher education

### **Introduction**

Mobile learning, as a new instructional strategy, joins a long list of potential delivery methods for possible use by students. Within the academic in universities or colleges, there are notable factors that must be given (addressed) to determine if m-learning strategies are appropriate. Most notably, the use of m-learning must be driven not by convenience, but by a determined need that this is the most appropriate and strategic way to deliver material or help students focus their thinking about some content or its application. Too often, technologies are adopted and used without critical examination of how they help students learn, and this becomes a particularly important challenge for the contemporary higher education management.

The popular of mobile devices and wireless networks within university campuses makes higher education a suitable place to integrate student-centered m-learning (Cheon et al., 2012). Mobile learning that utilizes ubiquitous devices will be a successful approach now and in the future because these devices including PDA, tablet PC, smart phone are more attractive among higher education students for several reasons; one of them is that the mobile devices are cheaper compared with normal PCs; also, they are satisfactory

and economical tools (Mohamad et al., 2010). Mobile devices have become more affordable, effective, and easy to use (Nassuora, 2012; Syafar & Husain, 2017; Syafar et al., 2017; Syafar & Gao, 2013b). These devices can extend the benefits of e-learning systems (Motiwalla, 2007) by offering university students opportunities to access course materials and ICT, learn in a collaborative environment (Nassuora, 2012; Syafar & Gao, 2013a), and obtain formative evaluation and feedback from instructors (Crawford, 2007).

M-learning can provide wireless communication between lecturers and students and between students themselves. It can work as additional support to complement and add value to existing learning models (Motiwalla, 2007). In addition, mobile technologies can be integrated/interoperable with others devices and systems (Syafar et al., 2015; Syafar et al., 2014a). Therefore, it is expected to become one of the most effective ways of delivering higher education materials in future (El-Hussein & Cronje, 2010).

Mobile learning applications have been utilized in university teaching and learning settings. Cavus and Ibrahim (2009) investigated the ability of learning new English language words using short message service (SMS). Wu et al. (2012) designed a context- aware mobile learning system for nursing training courses. The aim of the learning system is to guide nursing students to practice a physical assessment including gathering patient symptoms, identifying disease, and providing nursing treatment. According to Syafar et al. (2015), mobility of the students as the users, and mobility of the devices and learning services are fit with the technology and applications of mobile learning in higher education context. Furthermore, Syafar et al. (2014b) have found that mobile technologies support individual and work capability of the users (students and lecturers).

There are several issues facing the adoption of m-learning, and there are pedagogical issues regarding the use of mobile devices in classrooms; will it disturb the learning process? (Corbeil & Valdes-Corbeil, 2007; Park, 2011). Also, will users (both students and lecturers) adopt this technology? Users may not be willing to accept m-learning (Wang, Wu, & Wang, 2009). In addition, some university lecturers do not want to apply this technology or might face difficulties in trying to use it effectively as this new technology may require a lot of effort to implement (Abu-Al-Aish, Love, & Hunaiti, 2012).

Students' perceptions of m-learning need to be investigated at the initial step of implementing m-learning in higher education (Cheon et al., 2012). Therefore, it is necessary to conduct research that identifies the requirements or factors of university students consider important in the acceptance of m-learning.

The objective of this study is to investigate the factors influencing university students' acceptance of m-learning and to ascertain whether the following factors influence intention to adopt mobile learning; Performance expectancy, effort expectancy, social factors, facilitating conditions, perceived playfulness and self management of learning in Indonesia higher education.

## **Literature Background**

M-learning refers to using of mobile and handheld IT devices, such as Personal Digital Assistants (PDAs), mobile telephones, laptops and tablet PC technologies, in teaching and learning process (Alsaadat, 2009). As computer and Internet become essential tools for education, technology become more accessible, ubiquity, affordable, effective and easy to use (Syafar et al., 2015; Syafar et al., 2014). This provides many opportunities to widen participation and access to ICT, particularly the Internet (Trucano, 2015). Mobile devices such as phones and PDAs are much more affordable than desktop computers, and therefore represent a less expensive access to the Internet (even if the cost of the connection may be higher) (Trucano, 2015). The introduction of the Tablet PC can now access mobile Internet with much functionality than desktop computers. Quality Improvement Agency (2008) mentioned out the advantages of mobile devices in the field of education, including:

- It's possible to share assignments and work collaboratively; learners and practitioners can e-mail, cut, copy and paste text, pass the device around a group, or beam the work to each other using the infrared function of a PDA or a wireless network such as Bluetooth.
- Mobile devices can be used anywhere, anytime, including at home, on the train, in hotels - this is invaluable for work-based training.
- This technology may contribute to combating the digital divide, as this equipment (for example PDAs) is generally cheaper than desktop computers.

Furthermore, findings from studies conducted by Whilst Kennedy et al. (2008a) and Kennedy et al. (2008b), mobile devices allowed users to conduct at least nine activities in higher education as the following:

- to send pictures or movies to colleagues,
- to use mobile phone as MP3 player,
- to access information or services on the web,
- to make video calls,
- to take digital photos or movies,
- to send or receive email,
- to use mobile phone as a personal organizer (e.g. diary, address book),
- to send or receive SMS to colleagues, and
- to call the colleagues or others.

In universities, mobile learning helps educational institutions to enhance the accessibility, interoperability and reusability of educational resources and also to improve flexibility and interactivity of learning behaviors at convenient times and places (Murphy, 2006; Bohm & Constantine, 2016). As opposed to traditional learning, mobile learning focuses on the mobility of the learner as well as the mobility of the learning process itself (Constantine, 2016). For learners in general, mobile learning facilitates the use of previously unproductive time, enables learning behaviors regardless of time and place and brings about the great possibilities for personalized, customized and context-aware learning support services (Constantine, 2016). Through mobile learning, users can download different learning apps to their smart phones or other mobile devices via Apple App Store, Google Play, Windows Phone Store and BlackBerry App World (Chung et al., 2015).

Despite the availability of studies on mobile learning, its theoretical foundations have not yet matured (Muyinda, 2007). Despite the high degree of insertion of mobile devices in current society, the mere availability of technology itself does not guarantee that its potential will be used for learning or accepted by all evenly (De Carvalho 2012). Others also argued that the understanding of the adoption of mobile technologies in educational environments is still incipient and in particular, questions about how to promote the acceptance of mobile learning by users are still largely unresolved (De Carvalho 2012; Pozzi, 2007). In addition, students' needs with regard to mobile learning is still not fully understood (Al Masri, 2016). Mobile technologies is highly situated, personal, collaborative and long term (Syafar et al., 2018). According to Naismith et al. (2004) Mobile learning is also considered as truly promoting learner-centred learning because of the following features:

- Portability-the small size and weight of mobile devices means they can be carried everywhere and help learning occur at anywhere and anytime,
- Connectivity-providing learners with connections to other learning such as through other people, devices or networks,
- Interactivity-mobile devices are potential tools for enhancing a cooperative learning environment,
- Context sensitivity-mobile devices enable learning to take place which can make greater use of a person's,



- Immediate context and surroundings,
- Lifelong-mobile content consumption is continuous, there is no beginning, middle or end and
- Individuality-learning can be customised and based on previous learning experiences.

## Research Method

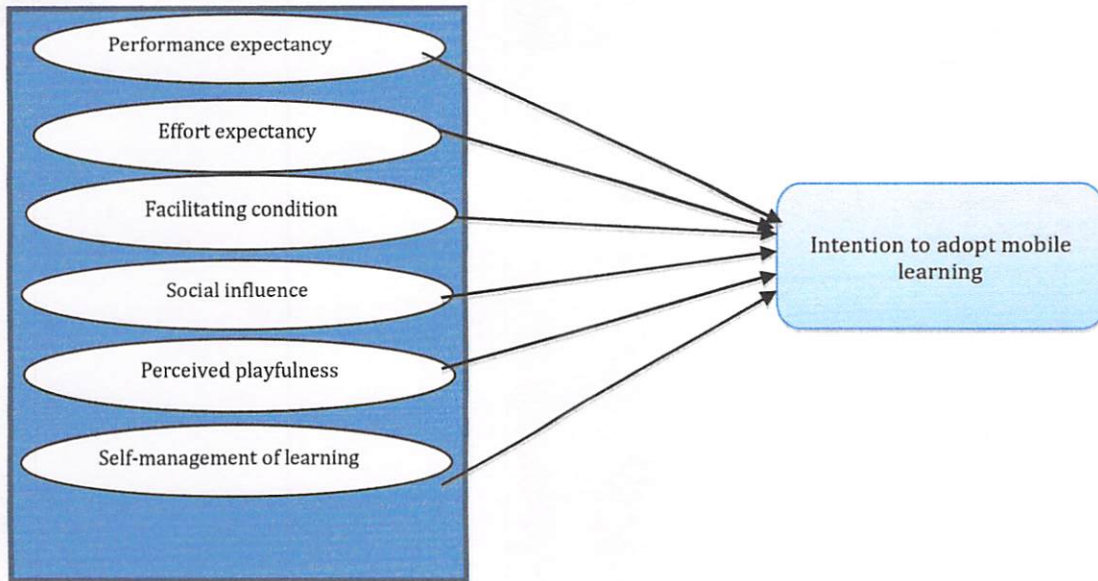
The Unified Theory of Acceptance and Use of Technology (UTAUT) model is one of the most widely used in the field of information and communication technology acceptance modeling which was developed by Venkatesh et al (2003). UTAUT could explain 70% of technology acceptance behavior (Masrom, Hussein, 2008). UTAUT consists of four key concepts that are, Performance Expectancy (perceived usefulness), effort expectancy (perceived ease of use), facilitating conditions and social factors that have a direct influence on intention to use it (Venkatesh et al., 2003). Together with these four constructs, we will have also explored the role of perceived playfulness and self management of learning. Drawing upon this premise, the present study will investigate the adoption of mobile learning based on the model shown in Figure 1.

The four direct factors is defined as follows:

- Performance expectancy, which is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447);
- Effort expectancy, which is "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450);
- Social influence, which is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451);
- Facilitating conditions, which is "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453).

While, the two additional factors explaining as follows:

- Perceived playfulness is considered one of the critical factors that could potentially affect learning engagement with the utilization of new teaching innovations and technology (Tan et al., 2004). Perceived playfulness will provide intrinsic motivation when individuals become completely absorbed in a technology (Agarwal & Karahana, 2000). An intrinsic motivator refers to the individual's performance or engagement in an activity due to his or her interest in the activity (Iqbal & Qureshi, 2012).
- Self management of learning is defined as the extent to which an individual feels he or she is self-disciplined and can engage in autonomous learning (Smith et al., 2003). Indeed, the need for self-direction or self-management of learning, runs clearly throughout the distance education and resource-based flexible learning studies (Smith et al., 2003; Warner & Choy, 1998; Evans, 2000). Since mobile learning can be considered as a kind of e-learning via mobile devices, it is expected that a person's level of self-management of learning will have a positive influence on his or her behavioral intention to adopt mobile learning.



Based on the theoretical foundation, this research led to testing the following hypothesis:

**H1:** Performance expectancy is a significant predictor of intention to adopt mobile learning

**H2:** Effort expectancy is a significant predictor of intention to adopt mobile learning

**H3:** Facilitating conditions is a significant predictor of intention to adopt mobile learning

**H4:** Social influence is a significant predictor of intention to adopt mobile learning

**H5:** Perceived playfulness is a significant predictor of individual intention to adopt mobile learning

**H6:** Self-management of learning is a significant predictor of individual intention to adopt mobile learning

## Data Analysis

The data analysis method consisted of two steps. Step one contained the assessment of the measurement model to examine if the model is a good fit with the data collected, based on the satisfactory results (i.e., after the construct reached the required measurement standard). We then could proceed to step two (structural model) with hypothesis testing.

## Measurement Model

An exploratory factor analysis will be conducted at the beginning of the analysis using principal components extraction with varimax rotation to extract six factors using IBM SPSS v.21 or latest version. Confirmative factor analysis will then be conducted using AMOS v.21 to assess the measurement model in terms of factors loading, reliability of measures, convergent validity, and discriminant validity.

Convergent validity can be evaluated using three criteria recommended by Fornell and Larcker (1981): (1) Factor loading greater than 0.50 will be considered as highly significant; (2) composite reliability should be greater than 0.8; (3) average variance extracted should exceed 0.5.

## Conclusion

Essentially, this study will provides both a theoretical and practical contributions to understanding the predictors of intention to adopt mobile learning and should be of interest to both researchers and practitioners. As for the researcher, the framework used in the study can be tested in other setting involving different types of population, within or outside Indonesia. As for the practitioner, this study, we believe, will sent a strong message on the importance of technological features such as performance expectancy and effort expectancy that need to be addressed when developing mobile learning applications.

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