# E-LEARNING MEDIUM: FACTORS INFLUENCING KNOWLEDGE TRANSFER AMONG VISUALLY IMPAIRED USERS OF MALAYSIAN E-LEARNING WEBSITES

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**Abstract:** This paper focus on the e-Learning medium factors which influence knowledge transfer (KT) among the visually impaired users (VIUs) of Islamic website in Malaysia.From previous researches, four factors of e-Learning medium were identified which are usability, e-learning quality, accuracy, timeliness and format of information. Interview was conducted among 41 respondents to identify the factors that affect the use of e-Learning as a medium of Islamic knowledge transfer for VIUs in Malaysia. This research is exploratory and uses thematic analysis to analyze data obtained from 41 respondents.The result showed that factors that affect the use of e-Learning medium for VIUs include mobile learning development, e-Learning quality, and availability of ICT infrastructure among other factors.
**Keywords:** E-learning, Knowledge Transfer, Visually Impaired, Islamic Websites.
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## I. INTRODUCTION

E-learning is a method of teaching, learning and training through the electronic means which is now used globally as a means of knowledge transfer by various organizations and people to disseminate knowledge to people without face to face interaction. Researchers such as Bell and Federman (2013); Munezero (2016) defined it as a type of learning that requires the use of computers to be carried out and is delivered through a networked technology. The recent technological revolution that has taken place in the past three decades has provided a platform for further development of educational opportunities (Embi et al., 2012). The use of ICT has become a new reality nowadays and as a result, the use of e-Learning for learning has become more common (Nikolaidis & Xanthidis, 2013). Each user has a different set of circumstances relating to their disability, and e-Learning websites need to take into consideration the limitations posed by these circumstances. However, the main focus of our paper is on the VIUs. Visually impaired users relate to those learners who are categorized as legally blind, having a visual acuity of 6/60 or less in the better eye, and/or a visual field of less than 10 degrees (Retina Australia, 2012). As a result, there is need to identify the factors that affect the transfer of Islamic knowledge to through e-Learning websites.

The purpose of this paper is to present the findings from a case study on the factors that affect the use of e-Learning websites in Malaysia for Islamic knowledge transfer to VIUs according to the VIUs, service providers (SPs) and the knowledge providers (KPs). The next section briefly reviews the relevant literature which includes the generation of a list of potential factors for effective Islamic KT (EiKT)to VIUs via e-Learning websites; the subsequent section discusses about the methodology, followed by the result and discussion sections. Finally, the conclusion of the paper is presented.

## II. ISLAMIC KNOWLEDGE TRANSFER

Knowledge transfer (KT) is the sharing of knowledge with the receivers in order to fulfil the receiver's knowledge needs (Hasnain et al., 2016). The importance of KT is to multiply knowledge quickly in order for knowledge to reach a large group of people on time (Lindkvist, 2005; Choi et al., 2010). As a result, KT is based on the absorptive capacity of an individual and his motivation to share knowledge. Islamic KT as defined for this paper is the process through which Islamic knowledge is exchanged between providers and receivers through the knowledge management medium (e-Learning). Even though, e-Learning is being used as a medium of learning for people with impairments, Zheng et al. (2012) stated that there are limited researches specifically focused on the development of Islamic knowledge courseware for the VIUs. However, Abdullah et al. (2011) mentioned that the effectiveness of Islamic KT model can be realized if the purpose for which the website was developed is fully achieved.

## III. CONCEPTUAL MODEL OF EiKT FOR VIUs VIA E-LEARNING

As a result of the lack of E*i*KT model for VIUs through e-Learning websites (Saowapakpongchai & Prougestaporn, 2012) which is the focus of the research, the researcher tries to develop an E*i*KT model for VIUs by utilizing an adapted form of Abdullah et al.'s (2011) effective KT in e-Learning model to facilitate the identification of factors that affect Islamic KT for VIUs through e-Learning websites as a medium. This model has been chosen because of its e-Learning capability and the identification of influencing factors that affect e-Learning websites. The researcher has extended the application of Abdullah et al.'s model in order to identify the factors that affect the knowledge receiver, knowledge to be transferred and the medium of knowledge transfer. Figure 1 presents the proposed conceptual model.

**Figure 1**: The proposed conceptual model (EiKT) for VIUs via e-Learning.
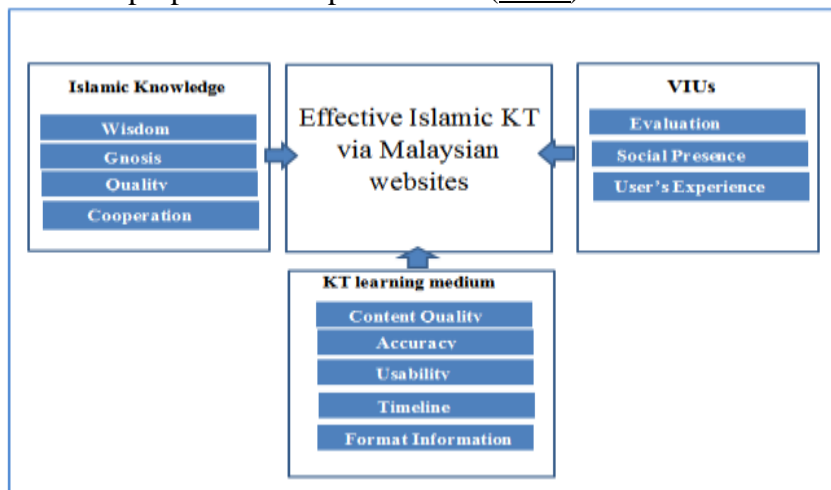


This conceptual model has been derived through the use of a significant number of relevant and associated literatures that concentrate on the factors and concepts that has been raised. Table 1 presents the factors, descriptions and their association with extant literature.

**Table 1:** Potential Factors for Islamic KT to VIUs Through E-learning Websites

| Groupings and Factors | Description | Associated Concepts & Authors |
| --- | --- | --- |
| **Mobile learning development** | A mixture of online learning and learning using materials previously downloaded onto handheld devices helps to reduce costs and the inconvenience of signal disruption. | (Attewell, 2005; Butean, Moldoveanu & Morar, 2015). |
| **Format Information.** | Ability to change the face, font type and size of interface and have control over the e-Learning website. | (Nganji, 2012; Rebaque-Rivas et al., 2013). |
| **ICT Skills.** | A person's belief in his capability to effectively use technology to improve learning or teaching. | (Luskin & Hirsen, 2010; Permvattana et al., 2013). |
| **E-learning Quality.** | Transfer of credible knowledge effectively and efficiently in a specific time according to the official standards required. | (Hammoudeh, 2012; Simonson et al., 2012). |
| **ICT Infrastructure.** | The e-Learning websites should have appropriate supporting ICT infrastructures. | (Hussain, 2004; Al-Sobhi et al., 2010; Karunasena et al., 2012). |
| **Usability** | Usability is the ease of use of an e-Learning website for the VIUs. Adaptive, rehabilitative and assistive devices and processes for locating, selecting and helping in providing support for people with different disabilities through allowing them in accomplishing different tasks. Audio, textual and audio-visual content that users' experience when using websites and they include, videos, sounds, images, text and animations. | (Bocconi et al., 2007; Schulze & Kromker, 2010; Saowapakpongchai & Prougestaporn, 2012). |

| | | |
|---|---|---|
| **Accuracy** | Islamic knowledge content provided on e-Learning websites should meet with the VIUs needs and expectations. | (Wang, & Strong, 1996; Ordonez, 2014). |
| **Timeliness** | The extent to which Islamic knowledge being regularly updated. | (Reimann, 2009; Luskin & Hirsen, 2010; Ordonez, 2014) |
| **Accuracy** | Islamic knowledge content provided on e-Learning websites should meet with the VIUs needs and expectations. | (Wang, & Strong, 1996; Ordonez, 2014). |
| **Gnosis** | Knowledge from experience especially experience of divinity or that which is beyond the five senses. | (Banu Shirin et al., 2014) |
| **Content Quality** | The way content is exhibited and presented which will help in achieving easy reading and understanding. | (Abdullah et al., 2011; Simonson et al., 2012; Saowapakpongchai & Prougestaporn, 2012) |
| **Wisdom** | Selecting the right way to transfer Islamic knowledge to VIUs depending on a suitable way according to their needs and ability, and total insight and having sound judgment concerning a matter or situation through understanding cause and effect phenomena | (Walker & Christenson, 2005; Burhan, 2012; El Garah et al., 2012 |
| **Co-operation** | Implementation of Islamic teachings on e-Learning websites should be carried out with love and affections. Islamic preaching on love and affection should be encouraged and impacted in the daily lives of users. | (Buzzi et al., 2012) |
| **Social Presence** | VIUs perception of being in and belonging in an online course. An instance of a higher degree communication medium is the video while that of a lower degree communication medium is the audio. People with the same interests coming together to share knowledge regularly. | (Russo & Benson, 2005; Lowenthal, 2008). |
| **User experience** | User experience is the level of positive or negative feelings which a specific user is experiencing in a particular setting during and after a product use which will propel a user for further usage. | (Betts et al., 2015; Beauregard et al., 2007; Hassenzahl, 2008; Johnson et al., 2009; Schulze & Krumker, 2010; Chu & Chu, 2010; Ordonez, 2014) |
| **Awareness Creation** | The e-Learning websites should have appropriate supporting ICT infrastructures. | (Al-Sobhi et al., 2010); Karunasena, 2012.) |
| **Government and voluntary Support.** | Provision of support in terms of development of ICT infrastructures and funding by government and voluntary organizations. | (Schwester, 2009; Al-Rashidi, 2010). |
| **Evaluation.** | Tasks should comply with guidelines and standards and provide feedback on all sections of the e-Learning environment. | (Luskin & Hirsen, 2010; Permvattana, et al., 2013). |
| **E-learning Experience** | Providers of knowledge must be experienced and vast to impact effective knowledge through e-Learning. | (Cooper et al., 2006) |
| **Motivation** | Giving motivation and incentive to users so that they will be able to make use of the website by providing ICT infrastructures and assistive technologies that can be bought at a reduced price for the visually impaired users. | (Faghih et al., 2013; Junus et al., 2015). |
| **Perceived Enjoyment** | Islamic knowledge should be transferred in ways that can be entertaining to the VIUs on the website. | (Junus et al., 2015). |

## IV. FACTORS THAT AFFECT E-LEARNING MEDIUM ACCORDING TO LITERATURE

`Various factors have been identified by different researchers as factors of e-Learning medium influencing KT, these factors are usability, e-Learning quality, accuracy, timeliness and format of information. Usability is concerned with the testing and utilization of standard usability techniques and principles, management of the quality of VIUs experience in the use of e-Learning websites (Yildiz et al., 2016). Content quality can be referred to as the way subject, text, information or topic is exhibited and presented which will help in achieving easy reading and understanding (Abdullah et al., 2011). Accuracy is the third factor obtained from literature and it refers to the extent to which the available knowledge document meets the users' needs and expectations. In terms of this research work, the Islamic knowledge content provided on e-Learning websites should meet with the VIUs needs and expectations (Wild et al., 2002). Timeliness is another factor that affects the use of e-Learning websites for KT. The measurement of timeliness is concerned with how the documents on knowledge are updated and if the available materials meet the demands of today. Contents and information shared through e-Learning websites should be reviewed from time to time (Wild et al.,2002). Finally, format information refers to the characteristics of the content such as the structured paragraph, understandable diagram and the font used. In summary, it can be seen as the appearance of the e-content. Relating this factor to the

VIUs, Rebaque-Riveras et al. (2013) stated that formatting on an e-Learning website for interaction of VIUs is based on the conditions of whether the specific format is accessible or not for them.

## V. METHODOLOGY

A semi-structured interview was conducted individually for 41 participants that consist of 14 visually impaired users (VIUs), 13 service providers (SPs) and 14 knowledge providers (KPs). Respondents that partook in this study were from Malaysian organizations which are: Malaysian Association for Blind (MAB), Society of the Blind in Malaysia (SBM), Persatuan Orang Cacat Penglihatan Islam Malaysia (PERTIS), Setapak Blindness Special Education Secondary School (SMPK), Ministry of Education (MOE), Jabatan Kemajuan Islam Malaysia (JAKIM), Universiti Kebangsaan Malaysia (UKM), International Islamic University Malaysia (IIUM), Universiti of Malaya and Teachers Training Institute for the Blind. VIU refers to the people who are legally blind or have vision impairment and as a result make use of assistive technologies to make use of the computer, internet or e-Learning websites. The SPs refers to the organization or companies that provide and manage the e-Learning websites through which Islamic knowledge (such as Hadith, Tawhid, Islamic economy and finance) is learned and transferred to users (VIUs). The KPs include the lecturers and teachers that teach users and impact knowledge to them.

The author asked each group of respondents' direct questions regarding the factors that affect the use of e-Learning websites as a medium of KT for VIUs. Data obtained from interview were classified according to the three groups of respondents. As the sample size used was small, the data analysis was done manually and the shared factors from all groups of respondents were stated. The interview transcripts were then analyzed, using inductive thematic techniques (Boyatzis, 1998; Braun & Clarke, 2006; Azizan, 2011). The potential factors were available to seed this analysis, supplemented with the outcomes of the thematic analysis which allowed the researchers to code category names that emerged from the data.

## VI. RESULTS

This section shows the response of participants on the factors that affect the use of e-Learning medium for the transfer of Islamic knowledge to VIUs. The factors stated are presented below according to the group of respondents.

### VISUALLY IMPAIRED USERS (VIUs)

Drawing upon analysis of the interviews, VIUs have identified four factors that affect the usage of Malaysian e-Learning websites for Islamic KT to VIUs. The factors include usability, mobile learning development, timeliness and ICT skills.

- **VIUs– UABILITY**

The website should be designed to provide users with easy and fast access to downloadable Islamic knowledge resources and have a good user interface quality. There should be availability of various languages that can be selected based on the user's choice. The e-Learning website for VIUs should be accessible for them irrespective of where they want to access it with less images and pictures in order to provide a smart website. *"The screen reader must be accessible and visible; website must be useable and accessible" (VIU_7:* Committee member*)*.

- **VIUs - MOBILE LEARNING DEVELOPMENT**

The ability to make use of mobile phones to continue learning at any time and any place by making connections from mobile communication devices to e-Learning websites through internet and wireless connectivity. E-Learning websites should be accessible through mobile for users as mobile phone is a global phenomenon and therefore will help the VIUs to access knowledge anytime from wherever they are.

*"Sometimes I use JAWS, the screen reader. Sometimes the JAWS are not accessible with Arabic word and characters because they are not created by Arabic people; they are created from the English people so they are not friendly with Arabic characters and Arabic word. So that using it is very difficult, because the Islamic come from Al Qur'an and Hadith. Right now, my iPhone is very good. We can explore internet through it. They have good Arabicsoftware that can read the Hadith and Al Qur'an very clearly through the internet. It is very efficient. If you want to go and read Arabic, you can goto the internet via iPhone. They also have by voice over" (VIU_14: Vice president).*

- **VIUs - ICT SKILLS**

In order for users to be able to make use of the e-Learning websites, prior knowledge on the use of computer, e-Learning, internet, screen reader, searching for knowledge is important to have an effective medium of transfer of Islamic knowledge via e-Learning to avoid misuse.

*"You must have skills in using screen reader, when using JAWS, still you must know how to use it effectively, that is also important because in order to help us to read Arabic scripts, therefore blind people use JAWS" (VIU_10: Member).*

- **VIUs - TIMELINESS**

**Definition:** E-Learning websites should be regularly updated with new Islamic knowledge and information. E-learning websites should be able to provide this knowledge to the VIUs at the required time.

*"Knowledge update on the website is very important because growth of knowledge is moving faster so the content of the website needs to follow the current situation" (VIU_1: Chairman).*

## SERVICE PROVIDERS (SPs)

Eight factors have been identified by SPs as factors that affect the use of e-Learning website as a medium of Islamic KT to VIUs in Malaysia. The factors are mobile learning development, format information, usability, ICT infrastructure, e-Learning quality, ICT skills, accuracy and timeliness.

- **SPs - MOBILE LEARNING DEVELOPMENT**

The adoption of mobile learning should be adopted in the support of Islamic knowledge learning. Incorporation of mobile learning will assist users in making use of their mobile devices to assist in their Islamic knowledge learning on the e-Learning websites. This factor emphasizes that there should be more development in the mobile learning aspect such as the development of mobile apps that can be downloaded and accessed on mobile devices to learn Islamic knowledge by the users. ICT skills are also needed to make use of smartphones for mobile learning to take place.

*"We can make use of the mobile application and smart phones that can read out all this information for the visually impaired. JAKIM has many mobile apps and we still intend to do more. We already have the basic appsthat people can make use of but we need to produce more, this is the overview of my JAKIM. The mobile apps by JAKIM are for the people and for the public, such as the salat app which informs users of the time to go for prayer, Subh, Zuhr, Asar, Maghrib and Esh'a" (SP_4: Director).*

- **SPs - FORMAT INFORMATION**

The availability of large fonts and audio will encourage the VIUs to use the e-Learning website to seek E*i*KT through it and they will be able to see what is written on the screen clearly and listen as well. Information on the e-Learning websites should only be provided in more text version and less graphics so that text to speech software will be able to convert it easily. The formats need also to consider the size of the document.

*"For now I stopped at the Quran part because it is not easy to read the text on the web. I can only listen to the audio or the video. I can't read the text because it contains Arabic text so I have to stop there for a while. I need to get someone who can help me with the Arabic text" (SP_2: IT Instructor),"Text only version of website so as to enable better text to speech reading" (SP_ 13: IT Officer).*

- **SPs - USABILITY**

The e-Learning website for VIUs should be accessible with less images and pictures in order, user friendly to provide a smart and usable website. For E*i*KT for VIUs, there should be availability of various languages that can be selected based on the user's choice; therefore, there is need for multilingual e-Learning website. Hardware or software that is designed to help people with visual impairment to be able to make use of e-Learning websites should be developed to improve the usability of e-Learning websites.

*"Language is very important, Arabic, English and Malay. Understanding language is very important, that is a major factor which will make learning Islam on web become more effective" (SP_2: IT Instructor).*

- **SPs - ICT INFRASTRUCTURE**

Basic ICT infrastructure should be available to VIUs. The required ICT infrastructures need to be set up with efficient support mechanism for an e-Learning medium to be used. Government should provide ICT infrastructures that can be used to support e-Learning for the VIUs. Good ICT infrastructures such as good internet quality, electricity, high bandwidths, awareness and training of instructors and VIUs on the use of ICTs and assistive technologies are needed by the VIUs to use e-Learning websites for learning.

*"Teach the blinds and the visually impaired people particularly about the use of computers, smart phones, as well as other kinds of technology because ICT will benefit the blind and the visually impaired people whether they are employed or not" (SP_2: IT Instructor).*

- **SPs - E-LEARNING QUALITY**

The Islamic knowledge content on the e-Learning websites should be prepared, presented and structured in a way that the users will be able to read and understand easily with important references and labels added for further information and show the quality of the content. The content on the e-Learning website should have comprehensive and better content so as to help users to be able to follow it and understand easily.
*"Websites should supply the specific references and labels. Layout should not be difficult to use" (SP_11).*
*"Better content and comprehensive content that can be easily followed and understood. It should also be Multi-lingual and have more interesting (quizzes, games, role-plays) and effective presentations" (SP_3: Director General).*

- **SPs - ICT SKILLS**

Prior knowledge on the use of computer, e-Learning, internet, screen reader, searching for information and knowledge is important to have an effective medium of transfer of Islamic knowledge via e-Learning to avoid misuse.
*"You should be aware that not all blinds and visually impaired are good computer users, good smart phone users, good web browsers or good web surfers. That is why they must have at least a bit of experience in surfing the web then only then will it be easier for them to understand the structure of the web, the interface of the web." (SP_2: IT Instructor).*

- **SPs - ACCURACY**

The Islamic knowledge that is provided matches and caters for the needs of the target users whether VIUs and none. Islamic knowledge to be accessed should be right and correct and the information being shared must be monitored and endorsed by the right authorities. The website should contain content that is accurate, relevant, regularly updated and which meets user requirements.
*"Skilled people should be in charge of the website to make sure thesources of the knowledge content are genuine, correct and accurate with Islamic belief." (SP_6: Officer).*

- **SPs - TIMELINESS**

Islamic knowledge e-Learning websites should be regularly updated so as to be able to add new knowledge according to the participants' views. The content should include the name of the content author and references used.
*"Knowledge update is very necessary but we still have to do a lot more. More content should be added and updated regularly. I'm getting updated content more or less once a year but we have to do it every second if many things come up. You can't wait, every day you have to update. If today is about jihad, tomorrow might be about something else. For instance, G.S.T. is one thing and people are asking is G.S.T. Halal? So the answer is yes G.S.T. is Harus" (SP_4: Director).*

### KNOWLEDGE PROVIDERS (KPs)
KPs have identified five factors based on their perceptions on the current e-Learning websites in Malaysia as a medium to transfer Islamic knowledge. The factors are mobile learning development, format information, usability, e-Learning quality and timeliness.

- **KPs - MOBILE LEARNING DEVELOPMENT**

The availability of internet access on mobile phones and computers will aid effective KT of Islamic knowledge among VIUs.
*"Now it is time for mobile learning. Every VIU isusing these gadgets to acquire knowledge and information as it is more user friendly for them. With some instructions they can know to touch anywhere" (KP_2: Lecturer).*

- **KPs - FORMAT INFORMATION**

The availability of large fonts and audio will encourage the VIUs to use the e-Learning websites to seek effective IslamicKT (E*i*KT) through it and they will be able to see what is written on the screen clearly and listen as well.
*"Website should have options of large font or audio. It should be easy to navigate, i.e. taking into consideration the eye movement that need to be made around the computer monitor while looking for information" (KP_14: Lecturer).*

- **KPs - USABILITY**

Accessibility and usability is important on e-Learning websites in order to motivate the VIUs to make use of them for learning Islamic knowledge. E-learning websites should also be user friendly for the VIUs; it must be easily accessible and not complicated.*"Usability and accessibility is very important because internet is a good way to provide knowledge to VIUs and it should be suppliedwith specific reference" (KP_4: Teacher).*
Computer software screen readers should also be made available which will aid E*i*KT as the VIUs can listen to what is on their screen instead of straining their eyes to read what is on the screen. For E*i*KT medium, there should be availability of JAWS and other screen reader software for the VIUs to use the e-Learning website.
*"Friendly means they can access the information. Sometimes you can see the diagram but they cannot see; how the website relates the info from the diagram must be related to the blind" (SP_13: Teacher).*

- **KPs - E-LEARNING QUALITY**

References should be provided in e-Learning websites to verify the authenticity of the Islamic contents being taught. The quality of the Islamic knowledge content should be based on the objectives that are to be achieved in the online learning and with accurate references for the users. The content should also be delivered in a way that the users (VIUs) will be able to easily access and make use of it. *"References are very important for the website in JAKIM. It is important" (KP_12: Lecturer)*

- **KPs - TIMELINESS**

E-learning websites should be regularly updated with new knowledge as often as possible. Many participants are of the opinion that the e-Learning websites should be regularly updated and with new information.
*"Updated information currently, introducemultiple approaches and answer the public enquiries immediately and politely" (KP_11: Officer).*
Table 2 shows the factors mentioned by the three groups VIUs, KPs, and SPs that influences the transfer of Islamic knowledge through the e-Learning websites for VIUs.

**Table 2:** Factors that affect Islamic KT according to VIUs, SPs and KPs

| VIUs | SPs | KPs |
|---|---|---|
| **Usability** | Mobile learning development | Mobile Learning Development |
| **Mobile Learning Development** | Format Information | Format Information |
| **ICT Skills** | Usability | Usability |
| **Timeliness** | ICT Infrastructure | E-learning Quality |
| | E-learning Quality | Timeliness |
| | ICT skills | |
| | Accuracy | |
| | Timeliness | |

## VII. DISCUSSION

Interview was used to identify the factors that affect the use of e-Learning websites as a medium of Islamic KT for VIUs from the VIUs, KPs and SPs. According to the three groups of respondents, the factors that were identified are usability of the website, possession of ICT skills by the VIUs, mobile learning development, e-Learning quality i.e. the quality and characteristics of the e-Learning website, format information and ICT infrastructure. Out of all these factors, the factors that were mentioned by the three groups of respondents which affect e-Learning as a medium of Islamic KT for VIUs are mobile learning development and usability of the e-Learning website. Attewell (2005) suggested the use of mobile learning development through hand held devices to increase convenience and reduce cost. Schulze & Kromker (2010) defined usability to be the extent to which a product can be used by specified users for achieving specific goals with efficiency, effectiveness and satisfaction in a specified context of use. An e-Learning website should be easy to use, possess good navigation and layout and should meet the requirements of the users.

## VIII. CONCLUSION

All three groups of respondents (VIUs, SPs, and KPs) mentioned mobile learning development and usability of e-Learning website as factors that affect the use of e-Learning by VIUs. Other factors mentioned are availability of ICT infrastructure, quality of content on the e-Learning website and possession of skills by the VIUs needed to make use of the e-Learning website. According to the findings of this paper, these factors are important for the use of e-Learning websites as a medium of Islamic KT for VIUs.

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