Design And Development of Persuasive Virtual Training Environment for Viva Voce Session

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Abstract - Some of the postgraduate students who have poor spoken English felt disadvantaged, have low self-confidence and suffered the feelings of anxiety and inferiority especially when it comes to viva voce session where English is used as the medium of communication. Most of them fear of failure and also fear of facing the examiners during the session. These are some of the factors that trigger the increase in the level of anxiety and stress among them. In addition to that, others factors also include mysterious, unpredictable and potentially frightening circumstances for the students. The students have to prepare well for the viva by reading many theses, attending mock vivas and discussing with recently graduated students. This paper proposes a new persuasive approach of viva preparation which is known as virtual viva simulator (V2Sim). V2Sim is based on virtual reality approach that uses an avatar as an evaluator for the postgraduate students. This paper discusses the design and development of the V2Sim in training the postgraduate students to face the viva voce session repetitively.

Index Terms - Virtual Reality, Virtual Viva Simulator, Avatar, Viva Voce, Persuasive Technology.

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1 INTRODUCTION

In many parts of the world such as Europe, North America, and New Zealand, the viva voce (oral exam or oral test) is a compulsory process in many universities to evaluate the research mode postgraduate students [1]. In Australia, as well as Brazil, India, Malaysia, and South Africa, the viva voce in some cases is optional, but mostly mandatory and it depends on the rules of the university [1]. The viva voce is an important session performed by the organization which allows for the examiners to assess the research work of the students through a question and answer session [2, 3]. However, the viva process varies within and across institutions and the process has been variously described in the literature as mysterious, unpredictable and potentially frightening for students [4, 5]. In this regard, the reasons for these include; fear of failure and fear of facing examiners whether external or internal during the viva session. For instance, [6] emphasizes that fear of failure is one of the common to virtually all candidates, where one of the international participant has stated "everyone on my shoulders, there

is too much to lose, my family, my mother, father, everyone, they all depend on me to do this". Another reason is fear of facing examiners relates in a posed of viva questions and how to answer it or number of questions on his/ her subject [1]. Generally, anxiety and stress are the main concerns of the postgraduate students during the viva voce session. Additional concern includes how they answer the unexpected questions effectively and vigorously. Therefore, the students must prepare well for the viva by being exposed to as many possible mock viva. Issues of anxiety and stress are the main concerns of postgraduate students during the viva session. So, mock viva session is used to overcome the anxiety barrier.

This study addresses this issue by proposing an innovative approach for viva voce preparation. This approach employs the usage of a virtual viva simulator. It is designed to ask the popular questions as expected in real viva by using an avatar. The PhD candidate will be able to access the virtual viva simulator at any time. In developing the simulator, Virtual Reality (VR) technology is used. VR is defined as computer simulation for designing a real or an imaginary system. It helps the users in performing the operations on a simulated system and shows the effects in real time [7]. It is one of the training methods that is popularly used in the education domain [8]. Virtual reality and virtual training are part of persuasive technology and they work as other computer simulations [9]. The following section discusses the design and development of the V2SIM prototype for viva voce preparation.

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3 DESIGN AND DEVELOPMENT OF V2SIM PROTOTYPE

In this section, we describe our experience in the design and development of the V2Sim prototype for the postgraduate students. In the process of developing V2Sim, the Rapid Application Development (RAD) methodology [10] and the prototyping approach [11] were utilized. The RAD method involves four phases that include; requirements analysis, design, construction, and cut over. On the other hand, the prototyping approach [6] consists of three main steps namely; developing an initial prototype, using prototype and revising and enhancing the prototype. These steps work sequentially where the first step begins by producing the first version of the proposed prototype. Next, the produced prototype will be used to identify its ability and adequacy. Third, all the inabilities in the previous version will be revised and enhanced. All these steps used by [11] were integrated into the third phase of the RAD methodology to address the perceived limitations of formal methodologies that are based on the traditional System Development Life Cycle (SDLC).

Requirement analysis or identifying the requirements is the fundamental process of designing the V2Sim. The main purpose of this phase is to determine the core elements of the V2Sim. The information obtained in this phase is from the literature review. Literature review gives an account of all what that have been published on a topic and accredited through books, journals, websites, periodicals, proceedings and etc. According to [12], existing documents are always the reliable sources for fact finding than people. A project requirement could be collected using various techniques [13], and document analysis are also one of the fact-finding techniques used in capturing the requirements.

The documents related to the oral exam or viva voce tasks as well as the virtual reality training are reviewed and the related facts are extracted and utilized to identify the core functionalities of the V2Sim prototype. According to [14], a standard viva voce exam is normally attended by an internal examiner among the academic staff of the university and an external examiner from a different Higher Learning Institution within the same area of expertise, management personnel, the supervisors and the student. In short, the core elements of a real viva session include; student, examiner (a person whose area of specialization matches the student's area) and questions that are asked during the session. So, in the development of the V2Sim, the core components include; the avatar, text to speech and the decision tree.

This phase involves the implementation of the V2Sim prototype life cycle processes. It is used to realize the functional system as shown in the integrated elements of the system planning and system analysis. The prototype focuses only on the pre viva voce training and education. The prototype is meant for the PhD candidates and Master students by research only. It is designed to ask questions that are usually asked during the real viva sessions. In addition, this prototype focuses on only three areas of Information Technology namely; Networking, Information Management and Artificial intelligence. Once the core requirements of the V2Sim prototype have been identified, they are listed for the next prototype development process. Figure 1 shows the V2Sim conceptual model to give more understanding of the components of the V2Sim prototype. These core elements of the model are the decision tree, avatar and sound. At this stage, two extra elements have been proposed to the V2Sim model namely; recorder and behavior.
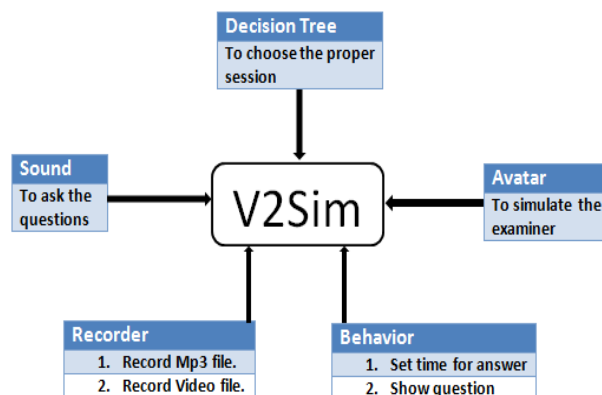

Fig. 1. V2Sim Conceptual Model

Firstly, the recorder is considered as a very important element for the students. It is expected to be used in playing the recorded session of the mock viva. This, if done, will show the strength and weakness provided for each of the questions. Secondly, the behaviour when applied makes the prototype to be more interactive, hence becomes similar to the real viva. This phase also gives the hardware and software requirements tools. The hardware and software that are needed during the prototype construction are shown in Table 1.

TABLE 1. HARDWARE AND SOFTWARE REQUIREMENT

Hardware	Software
Personal computer	Microsoft Windows 7
Digital camera	Microsoft Office 2010
Microphone	Adobe Flash CS6
Scanner	Adobe Photoshop CS6
Printer	Windows Movie Maker
	BB FlashBack Express
	WampServer
	Notepad++

Many applications can be used to create an avatar. Some of these are online-based available on http://www.oddcast.com, http://www.sitepal.com/ and http://www.voki.com/. On the other hand, 3D modeling tools used for creating an avatar like 3DS Max and Blender are also available. The most important phase of the methodology is the construction. Construction focuses on application and program development task related to the expected functions of the V2Sim prototype. The technique used to develop the prototype at the construction stage is adapted from [11] approach. Therefore, the V2Sim has several steps to be accomplished before a higher fidelity prototype is realized. In this phase, an avatar was created as one of the important part of the construction steps. Developing the avatar can be done through diverse ways, for example, voki.com and sitepal.com provided the tools that can be used online. In addition, set background, text to speech technique can be used from gadgets provided by these websites. In this paper, the first avatar was created by the provider. After that, we created another avatar to make the prototype more similar to the real viva. The second avatar is created to be similar to the image of an academician. In creating the avatar, the picture of the lecturer was created, then modified using Photoshop CS6. Besides that, the BB FlashBack software was used to record twenty-two questions for each session. This gives the total output of these processes to be twelve videos. Moreover, a decision tree was developed using PHP programming language. PHP is a general-purpose scripting language suited and mostly used for server-side web development. PHP is mainly run on a web server. In this case, we have to install the server to run the PHP code. WampServer is free and it is compatible with the PHP codes. The outcome of this process is a decision tree PHP script. It is used to determine the proper session for each of the students through their data entries. The V2Sim prototype has three domains on the main page of the design as shown in Figure 2. This allows for postgraduate students to choose one of these main domains. After that, the simulator will display the sub domain. For example, sub domain for artificial intelligence area illustrated in Figure 3. Later, when the student selects any sub domain from the displayed list, the session immediately will start. Figure 4 shows the avatar session page.

Fig. 2. Main Page of V2Sim

Fig. 3. Sub Domain Page of V2Sim

Fig. 4. Session Page of V2Sim

Cutover is the fourth phase of the RAD methodology. In this step, a comprehensive test was conducted for the V2Sim prototype. The test was to ensure that all functions and activities stated in the requirements' analysis are correctly implemented. Lastly, the V2Sim is uploaded to the global host. Cutover provides the best approach for the evaluation phase.

4 CONCLUSION

Research in the used of virtual simulator for the purpose of training postgraduate students in preparation for viva voce session is still scarce. The utilization of VR in viva voce preparation training in higher learning institutions especially in Malaysia is still new. As such, this paper has looked into the possibility of introducing a new concept of viva voce preparation through the use of VR technology. This paper proposed the virtual viva simulator (V2Sim), a new technique for viva voce preparation. This study focused on the virtual training environment approach. V2Sim prototype is aimed to simulate the real viva voce by using an avatar as the examiners. Also, it uses decision tree principle to determine the proper questions for the particular student. The main contribution of this paper is to create a persuasive virtual viva simulator (V2Sim) prototype. An evaluation of the V2Sim prototype will be conducted among 30 postgraduate students of Universiti Utara Malaysia for further work.

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