

Using a Situated Speech-based Holographic Projection System to Learn the Analects of Confucius

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Abstract: In this paper, based on the concept of situated learning, we describe the framework of speech-based holographic projection, which is comprised of the elements of learning content, holographic projection as authentic context, and interactive activities. Based on the speech-based holographic projection framework, we applied the system to convey the content of the Analects of Confucius.

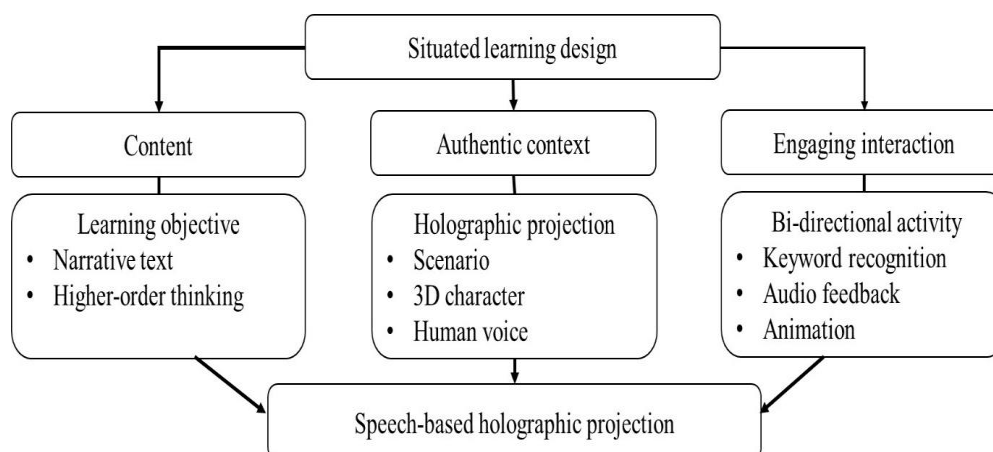
Keywords: Holographic projection, Speech recognition, Situated learning, The Analects of Confucius

1. Introduction

Confucius's teaching and reflections on learning, community, and the conduct of life have a profound influence on both Chinese society and the wider global community (McLeod, 2014). However, due to the Analects of Confucius is written by Classic Chinese, many students fail to understand its abstract thoughts by using the textbook and consider it as a big challenge to study it (Sung, Hwang, Chen, & Liu, 2019). Therefore, this study aimed to provide a speech-based holographic projection system to help students learning the Analects of Confucius.

2. Design framework

As the characteristic of situated learning in game-based emphasis on how learners participate in situated authentic context (Zhang, & Shang, 2016), Key tenets below are essential to support the construction of situated learning environment. In the paper of Green, Eady, and Andersen (2018), constructive learning approach, authentic context, and social interaction are the three main elements of situated learning. To foster the situated learning design in multimedia, this study proposes a speech-based holographic projection framework, which corresponds to the key tenets of situated learning theory claimed by Green et al. (2018) The core element of the framework includes content, authentic context, engaging interaction as illustrated in Figure 1.



3. Figure 1. Speech-based holographic projection framework

3. Implemented system

Based on the speech-based holographic projection framework, we applied the system to convey the content of the Analects of Confucius (as shown in figure 2). This system is made with Unity to build the scene, and Google Cloud kits to construct the speech recognition system and exported into APK file.

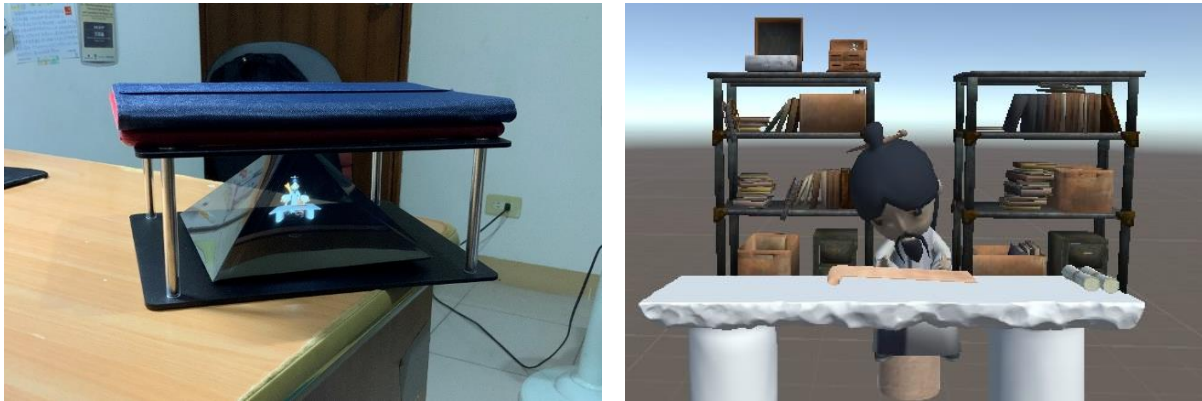


Figure 2. The holographic projection

The content of the system is excerpted from the Analects of Confucius. Three important stages of stories about Confucius is selected, and divide each into three points to express further information. The first stage emphasis on the background of Confucius. As the family situation and the interest to Rites of Zhou made him study harder, these experiences settle the basis of his achievement. In the second stage, the educational philosophy is the core. Introduced from how Confucius realized that education might assist the civilian, to his remarkable attainment in the education sector. Finally, this stage reviewed the achievement of Confucius on publication works, influence on the history at that time and to posterity. According to these narrative texts, the philosophy of Confucius and the influence on the posterity are directions to do critical thinking. Besides, objective knowledge is not only applicable to Chinese courses but also possible to impacts points of view in life.

The scenario consists of 3D models of Confucius, his students, and the background build up the authentic context which is helpful for learners to experience. Furthermore, 3D models of Confucius is also voiced by a real human, which makes the projected-Confucius closer to a real person. The authentic context brings the scenes thousands of years ago into reality and might be one of the most applicable situations that learners immerse in.

To interact with the 3D Confucius, the speech recognition system makes it possible for learners to learn by communicating with him. When awake the system through specific sentences invoice, which means there is no need to press button or type orders, 3D scenes about the keyword related to Confucius will show up in the hologram environment. With the speech recognizer, students might be able to pay attention to the learning target and can gain knowledge in one of the most straightforward ways. Also, there would be audio clips of the story from the perspective of both the narrator and Confucius, is played coordinate with the scene showed up in the environment. Through both ways of verbal and visual aids, plus the bi-directional activity of learners' voice and the audio clips, we expected that learners would gain learning motivation and acquire the objective better.

As this study emphasizes the framework of speech-based holographic projection, we aim to solve some of the difficulties using AR and VR. The authentic context of the scenario and the interactivity of the speech reaction system plays an important role in this study.

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