How to Judge Learning on Online Learning: Minimum Learning Judgment System

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1. INTRODUCTION

Over 10 million people participate in online learning courses, which has resulted in the proliferation of the use of MOOCs.

Consequently, the number of online courses that implement online learning platforms, such as Moodle, Coursea, and edX has steadily increased in online education.

However, due to the high number of students participating in MOOCs, one critical problem that must be addressed is how instructors can conduct learning assessments that determine learning.

Traditional assessment methods are not suitable for online education. Most existing online learning platforms require a simple quiz and online exam based on traditional assessment methods [2].

Many quizzes and exams can be a burden to both instructors and students. Thus, it is necessary to develop an automatic learning judgment system that can quickly and simply assess learning.

In this paper, we aim to design and develop a minimum learning judgment system.

Our approach aims to solve learning assessment challenges in online education in order to minimize the amount of effort required by teachers and learners in assessing learning.

2. Minimum Learning Judgment System

2.1 Definition of Minimum Learning

For definition of Minimum Learning, In this paper, we define minimum learning as a behavior state of initial learning.

In other words, watching video content is the minimal behavior of learning apart from understanding.

It does not mean that system can assess understanding of content knowledge.

2.2 Judgment System

The 9th International Conference on Educational Data Mining  EDM 2016

2.3 Word Game

In the word game, the student decides whether words did or did not appear in the video.

The system judges minimum learning by measuring the student’s response time and accuracy in the word game.

The words that appear in the word game use word frequency from uploaded video content and the Sejong corpus (made by www.sejong.or.kr).

In order to select words for the word game, words are selected by measuring the weight of each word, which is based on both previous videos that the student learned and on the current video content that student is watching.

Each student plays a word game with a different word set in which different weights correspond to different learning logs. The weight of a word is calculated as follow:

\[ w_{ij} = t_{fj} \times \log \left( \frac{N_j}{n_i} \right) + 1 \]

A weight \( w_{ij} \geq 0 \) is associated with each word \( j \) in a video content. Let \( t_{fj} \) refer to the frequency of word \( j \) in video content \( f \). Let \( N_j \) refer to the number of video contents the student viewed in the entire set of video contents. Let \( n_i \) be the number of video contents where \( w_{ij} \) appears in N.

3. EXPERIMENTS

In order to get a criteria score, we conducted an experiment in which we tested 60 undergraduate students.

For this experiment, system judged minimum learning by allowing learners to watch the video content or not.

In a test set, 240 undergraduate students participated in the experiment. Participants were divided into two groups: an experiment group, which consisted of 120 students who watched the video content, (Pass) and a control group, which consisted of 120 students who did not watch the video content (Fail).

Finally, the performance of system shows about 95%.

4. CONCLUSION

This paper presents how a minimum learning judgment system can solve assessment challenges in online education environment by reducing the work required by both instructors and learners.

This system shows about 95% performance but it is optimized for the training data set.

But, we need to conduct further experiments and analyses using machine learning algorithms and educational data mining technologies in order to develop and strengthen our system.

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ACKNOWLEDGEMENTS

This work was supported by the KOSEF program of MEXT (2016). Development of distribution and diffusion service technology through statistical and collective intelligence to digital contents.