The purpose of this research is to develop a web-based learning environment where teachers can provide subject content using SCORM Simple Sequence Specification (SSS) mechanism with guided learning paths to cultivate learners' goal setting skills. This research investigates the difference in learning performance between the process goal and the outcome goal. The subject of the study is “division of decimals” in elementary school curriculum. The results show that there are no significantly difference in the aspects of learning scores and satisfaction between the Process Goal Group and Outcome Goal Group. Furthermore, the Process Goal Group is more efficient than the Outcome Goal Group in time spent for completing the learning objectives. Moreover, the learners who had a higher post-test score in the Process Goal Group spent significantly less time to achieve the learning objectives than those who had a lower post-test score. However, there is no such finding for the Outcome Goal Group.

1. Introduction

Goal setting affects learning motivation, performance and discipline of learners [1], and it is classified in two forms: outcome goals and process goals. Various studies have also found that the learner’s learning performance relies on either the process goal or the outcome goal. The process goal encourages the learners to focus on learning methods and learning strategies in the learning process, whereas the outcome goal is focused only on the final outcome of learners [2].

The purpose of this research is to develop a goal setting web-based learning system where teachers can apply process goal or outcome goal as goal setting strategies for learners. Furthermore, we also compare the difference of learning performance between the process goal and the outcome goal for web-based courses.

2. Research methodology

We have developed an advanced web-based learning system with SCORM 2004 Simple Sequencing Specification (SSS) mechanism where teachers can apply process goal or outcome goal as goal setting strategies for learners. The whole required content was developed for the online course, covering all the 24 concepts listed by the domain expert.

In the process goal learning flow, each unit contains learning material for one type of “division of decimals” concept. Learners first go through the material and take a test. If they pass the test, they can proceed to the next concept. However, if they do not pass the test, they are given video based explanations of the concept. After reviewing the video, the learners take the second test. If they pass this time, they can then proceed to the next concept.

In the outcome goal learning flow, there is no difference in the actual learning material of the outcome goal learning and the process goal learning. However, in outcome goal, the units are not presented to the learners in any strict sequence. They can access the material in any sequence they want, without having to take any tests. Learners can freely move around in various units as they wish.

The subjects of this study were primary school learners. These classes were named for the purpose of our study as “Process Goal Group” and “Outcome Goal Group” respectively. The Process Goal Group had 31 learners, while the Outcome Goal Group had 30 learners.

3. Results and discussion

A pre-test and a post-test were employed to evaluate the learning scores. For learner satisfaction, a
seven point Likert scale was developed to measure learner’s satisfaction about the course. For learning efficiency, we used how much times they spent to achieve the learning goal.

3.1. Learning scores

Although the previous studies had already shown that good teachers usually prefer the process goal than the outcome goal in learning [3], no difference was detected between Process Goal Group and Outcome Goal Group in learning scores in our study. It should be noted here that plentiful and no difference materials were provided to both groups. When the Outcome Goal Group encountered difficulties in learning “division of decimals,” they could find appropriate materials easily in learning management systems, even though they were not requested to follow the well-designed teaching strategies. Therefore, the complete learning material support is very important for web-based learning.

3.2. Learning satisfaction

There is no difference in the actual learning material of the Process Goal Group and the Outcome Goal Group. They used same learning system to learn, with the only exception that in Process Goal group, the units were presented to the learners in a strict sequence. The results show no difference in learning satisfaction and the means are both significantly above the midpoint. It implies that the two conditions of Process Goal Setting and Outcome Goal Setting can be accepted generally by the web-based learners. The instructors can apply SCORM 2004 Simple Sequencing Specification mechanism to design different teaching strategies in the web-based learning systems.

3.3. Learning efficiency

Results show that there is no significant correlation between the goal setting model and the understanding level. However, significant correlations exist between the goal setting model and time spent, as well as between understanding level and time spent. The subsequent analysis of these relationships is as follows:

(1) Goal setting model vs. time spent

This result indicates that the Process Goal Group has more learning efficiency than the Outcome Goal Group. This implies that the Process Goal Group could save more time for the other learning activities.

(2) Understanding level vs. time spent

The understanding level is negatively correlated with time spent. As for the learners under the Outcome Goal Setting, no significant correlation was found between the understanding level and the time spent. This means that when the understanding level is higher then the time spent is lower for the Process Goal Group, but no such relationship exists for the Outcome Goal Group. We found the learners who demonstrated a high understanding level had outstanding grades in their past learning experience. It implies that the high caliber learners would learn more efficiently under Process Goal Model. This result can help instructors to design appropriate learning strategies for the web-based learners.

4. Conclusion

The present research used the “Division of decimals” as the curriculum to be taught through goal setting strategy; future researchers may choose other disciplines or topics as the scope of their study. Our study used fifth-grade primary school learners as targets, while future researchers may choose targets with a different educational background or school levels such as junior high, high school, vocational high school, or even college level learners to undergo goal setting strategy. This could further allow comparative analysis of different types of learners under the goal setting strategy and uncover possible differences in learning effects.

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References