THE IMPLEMENTATION OF THINKING SKILLS MODULE FOR SECONDARY SCHOOL STUDENTS

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ABSTRACT
Thinking skills could be taught together with subject matter using the infusion approach at schools. But, using self-instructional modules could be an alternative approach and make significant contributions.
Module is a planned series of learning activities designed carefully to assist the learners to accomplish certain specific objectives. An attempt to develop and implement a modular approach on teaching thinking skills was made in the secondary school. A quasi-experimental design research has been carried out to affirm the effectiveness of this module in test achievement among the students. Statistical analysis was done via an “intention to treat” comparison of post intervention scores and comparison of the change in scores from pre- to post intervention, using a two-sample t-test. Students participating in the self-instructional modular approach had a significant improvement in knowledge scores compared to non-participants.
Field of Research: Thinking skills, self-instructional module, modular approach.

1. Introduction

It is important to teach thinking skills explicitly besides the school subjects (Rajendran, 2008). On the other hand, even when we ask higher-order questions or when we select powerful content to activate thinking, the way we work with pupils can often result in only a minority of pupils being involved in the dialogue (Wilson, 2008). Besides that, normally students are locked into the same instructional sequence with the same learning materials (Noordin & Yap, 1993). Although individualized instruction may appear to be an easy solution, but there are many constraints within the school context. Therefore, using modules as a strategy for teaching and learning can be an alternative approach and make significant contributions (Tee et al., 2012a). On the other hand, modules are not just “job sheets’ or “old style work units” or “chapters of books” with questions added (Meyer, 1988). Module is a planned
series of learning activities designed carefully to assist the learners to accomplish certain specific objectives (Tee et al., 2012c). In this case, our job in education is to provide both the contexts for developing thinking, and the confidence and competence in using knowledge tools.

2. Purpose of the Research

The purposes of this research are to develop and evaluate the qualities of the Thinking Skills module. Specifically, the research objectives are to:

(i) develop the Thinking Skills module.
(ii) analyse the effectiveness of Thinking Skills module on students’ test achievement.

3. Methodology

This is a quantitative approach research started with the development of Thinking Skills module using Meyer Model (1988). The effectiveness of the Thinking Skills module was identified through two-sample t-test based on the quasi-experimental design that consists of a control and treatment group (Table 1). Both groups were given pre- and post intervention test that consists of 60 items on Project Design and Production topic for Living Skills subject. The present study is commonly referred to as a quasi-experimental study, a design that could also be called a hybrid form between an observational study and an intervention. The total study extended over a period of 2 months. After the pre intervention test, treatment group started the treatment by using the Thinking Skills module, whilst the control group without any treatment. The Levene’s test (> .05) showed that at the pre intervention period, both groups of student were homogeneous.

<table>
<thead>
<tr>
<th>Table 1: Pre- and post intervention test</th>
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<tr>
<td>Pre intervention Test</td>
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<tr>
<td>Treatment Group</td>
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<td>Control Group</td>
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</table>

3.1. The sample

40 students for treatment and control group respectively were involved with the quasi-experimental design on assessing the effectiveness of Thinking Skills module on test achievement.

3.2. Reliability

The internal-consistency reliability value for the achievement test that consists of 60 items was $\alpha = .92$.

4. Development of Thinking Skills Module

The development of Thinking Skills module was based on Meyer Model (Figure 1).

4.1. The fundamental characteristics of modules

Modules meet the conditions necessary for effective learning (Meyer, 1988). This occurs because modules have certain fundamental design characteristics which have emerged through the application of ideas from the theory of learning. Among the characteristics are the module is essentially self-contained, self-instructional, concerns on individual differences, provides clear statement of objectives,
emphasizes optimal association, sequence and structure of knowledge, utilizes variety of media and methods, provides information on progress (feedback), gives immediate reinforcement of responses, encourages active participation of the learners and promotes mastery evaluation strategy in learning process.

4.2. The components of a module

Most modules are designed on similar principles (Tee et al., 2012b). Major components of a module includes the instructional on how to use the module, statement of purpose and aim, list of pre-requisite skills, list of instructional objectives expressed in performance terms, diagnostic pretest, list of equipment and other resources required, sequenced instructional activities and mastery post test.

4.3. Steps in design and development of a module

Figure 1 shows the steps in design and development of a module. There are 11 main steps on developing a module based on the Meyer Model.
5. Findings and Discussions

Both groups of students in the treatment and control group were taught by the same teacher on the topic Project Design and Production for Living Skills subject. The post-intervention test was used to identify the students’ test achievement. Two-sample t-test was used to test for differences among groups between the mean scores at the pre-intervention as well as the post-intervention test. Mean scores for treatment group were compared to mean scores for control group. The paired t-test was used to compare the changes in scores from pre- to post-intervention in the two groups. A level of $p = .05$ was considered to be statistically significant.

5.1. Between-group performance
The average scores were 48.97% (pre) and 54.96% (post) for treatment group, 47.46% (pre) and 45.54% (post) for control group. The mean pre intervention and post intervention scores of the comparison groups are shown in Table 2. While there was no statistically significant difference between the groups in the scores obtained at the pre intervention test (Table 2), this difference became statistically significant at the post intervention test.

5.2. Within-group performance

The improvement in scores was statistically significant for treatment group, in which the students improved by 5.99% on average (p < .05). The post intervention score of control group worsened on average by 1.92% (p < .05).

In this quasi-experimental study, we examined the effect of Thinking Skills module on students’ test achievement. There was a significant improvement from pre intervention to post intervention for the test achievement among the treatment group students. The average score at the post intervention test was also significantly higher than that for the comparison group, who did not participate in the use of Thinking Skills module. Participation in the self-instructional module certainly implies more complete and attentive reading of the Thinking Skills module that is also independent of the students’ personal interests on reading. We suggest that the students to be motivated along the use of the modular approach.

Table 2: Mean pre- and post intervention scores of the comparison groups

<table>
<thead>
<tr>
<th></th>
<th>Treatment Group</th>
<th>Control Group</th>
<th>Between-group Comparison</th>
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<tbody>
<tr>
<td>Pre intervention</td>
<td>48.97%</td>
<td>47.46%</td>
<td>.477</td>
</tr>
<tr>
<td>Post intervention</td>
<td>54.96%</td>
<td>45.54%</td>
<td>.000*</td>
</tr>
<tr>
<td>Score’s Variation</td>
<td>+ 5.99%</td>
<td>- 1.92%</td>
<td></td>
</tr>
<tr>
<td>Within-group Comparison</td>
<td>.000*</td>
<td>.000*</td>
<td></td>
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</tbody>
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*p < .05, 2-tailed

6. Conclusion

Generally, self-instructional module is very useful to students. With this module, the students are able to learn the thinking skills and apply it directly on study. Moreover, students could learn at their own pace by using this self-instructional module. The study also showed that using the Thinking Skills module benefits the students on test achievement.

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References


