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## The Effectiveness of A Student-Generated Question Technique on Reading Achievement : An Experimental Study

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### Abstract

This experimental study investigated the effectiveness of the student-generated question technique. It aimed to find out whether teaching reading by students' questioning was better than answering questions posed by a teacher in increasing students' reading ability.

Two groups of first-year nursing students at Mahidol University were randomly assigned to either control or experimental groups. Each group consisted of 30 students. The control group received practice in answering teacher's questions while the experimental group practiced generating their own questions after reading. They were taught for a semester in the regular reading course. The tool employed to determine the English reading achievement of both groups was an English reading achievement test constructed by the researcher. A self-generated question test was also administered to students in order to determine whether trained and untrained students could generate questions on their own. A questionnaire eliciting students' attitudes toward the self-generated question technique was taken into consideration.

The findings of this study can be summarized as follows:

1. Teaching reading by the student-generated question technique significantly increased students' reading ability at the .001 level.
2. The weak and average students in the experimental group achieved significantly greater results than did those in the control group. Good students in both groups showed no statistically significant differences from each other.
3. Trained students gained a significantly higher mean score than untrained students at the .001 level.
4. The majority of students revealed a positive attitude toward the student-generated question technique.

The implications for teaching and reading English are as follows:

1. Students should actively be trained to generate their own questions instead of answering teacher's questions. They should be equipped to be independent readers. To facilitate this, extensive training should be provided in reading courses.
2. Weak and average students should particularly be trained to monitor their state of reading comprehension by using the self-generated question technique.
3. English teachers should arrange an appropriate environment for training students to generate their own questions and they themselves should be good models for asking questions.

## Introduction

Several research studies conducted to examine Thai students' English reading ability report that English reading ability of students at all levels is unsatisfactory. This may be due to the reason that students are so directed that they rarely think for themselves. For this reason, many educators have suggested that students be trained to develop strategies that allow them to think independently. A strategy widely advocated is a student-generated question technique. This technique has a crucial role in reading. Nolte and Singer (1985) advocate that a process of question asking throughout reading is active comprehension, for instance. Student questioning is a tool for acquiring knowledge not only in pre-reading and during-reading phases, but also in post-reading activities. Concerning pre-reading activities, this technique helps students set purposes of reading and selecting information (Singer, 1978). In addition, this technique enables students to identify the important part of materials (Andre & Anderson, 1978) to engage in a deep processing (Singer, 1978), to organize or rehearse knowledge, to monitor and regulate comprehension, to heighten self-awareness of comprehension adequacy (Anderson, 1979, Brown, 1979), and to foster their own active comprehension (Gavelek & Raphael, 1985) during the reading phase.

Furthermore, the role of self-questioning in post-reading effectiveness helps students decide what strategic action will be continued next (Andre & Anderson, 1978-79), increase recall and retention of information and become independent finally (Singer, 1978). What is more, this technique also helps a teacher to know students' level of perception, background knowledge and cognitive development.

A number of research studies concerning self-questioning have been conducted to determine the efficacy of questions generated by students. Beneficial results of the student-initiated question technique were found. Andre and Anderson (1978-78), for example, claim that the self-generated question technique leads to greater effects on English reading comprehension than does the traditional technique. They also stress that low and average reading ability students benefit greatly from this technique. A research study conducted by Nolte and Singer (1985) also advocates that self-questioning enables students to perform better in English reading activity.

Though a number of research studies have been extensively conducted to examine the effectiveness of self-questioning, so far relatively few research efforts have been directed in this area in English reading classes for Thai students. As stated by Sangakit (1990)

students have rarely been trained to generate their own questions in the reading class. Therefore, this experimental study was designed to determine the effects of self-generated questions on English reading comprehension in the Thai context.

### Objectives

The purpose of this experimental study was to determine the effectiveness of student-generated question techniques on the reading achievement of the first year nursing students at Mahidol University. This study, therefore, was conducted:

1. To determine the English reading achievement of students not receiving instruction in the self-questioning technique.
  2. To determine the English reading achievement of students receiving instruction in the self-questioning technique.
  3. To compare the English reading achievement of students receiving conventional techniques and that of students receiving instruction in the self-questioning technique.
  4. To compare the English reading achievement among students of different English reading ability -- good, average, and weak -- in both groups after instruction.
  5. To compare the scores derived from a self-generated question test of students untrained to ask questions and those of students trained to generate their own questions after instruction.
  6. To investigate students' attitudes toward using the self-generated question technique in reading.
2. Students may better acquire knowledge from reading by developing this strategy.
  3. Students may be encouraged to have a more positive attitude towards a self-questioning strategy than they have at the present time.
  4. Self-access reading programs might be set at any English language institute so as to foster development of students using self-directed learning.

### Method

The sample comprised 60 first year nursing students at Mahidol University. They participated in this study in their regular English class. The subjects were randomly assigned to either a control group or an experimental group. The design of this study involved two between-subject factors and one within-subject factor. The between-subject factors were two study techniques (student-generated questions and teacher-posed questions) and reading ability (good, average, and weak). The within-subject factor was an English reading achievement test given as pre-test and post-test. Prior to the experimental phase, both groups were administered a pre-test so as to assess their English reading ability. The subjects in the experimental group were trained to generate their own questions while those in the control group were required to answer questions posed by a teacher. Both groups, however, were instructed by the researcher.

Since this experiment aimed to determine the effectiveness of the student-generated question technique, each unit of lessons for the experimental group was divided into two sessions: the teacher's model and practice. The teacher illustrated how to generate questions as a model in the first session while the last session enabled students to practice asking their own questions. The teacher-modeled session included three stages: pre-reading, during-reading, and post-reading, respectively.

The results of this study may have the following implications:

1. English reading teachers may gain a better strategy to facilitate teaching reading.

- Stage 1: Pre-reading activities  
The pre-reading stage aimed:  
to introduce and arouse interest in the topic.
- Stage 2: During-reading activities  
The aims of this stage were:
- to help understanding of the text structure or language functions,
  - to clarify the reading content,
  - to help understanding of the author's purpose.

In this stage, students engaged in sequences of instructional episodes including four activities:

#### 1. *Information gathering*

This information gathering referred to the stage in which students gained information from silent reading practice. They could extract meaning from sentences and paragraphs in a more or less sequential order.

#### 2. *Student response*

After gathering information, students were required to engage in a response-demand event by asking their own questions in written forms. The questions asked by students, concerned the main idea of a topic, the author's purpose, and their judgement and emotional response to that topic.

#### 3. *Response judging and feedback*

When students posed questions, they were required to make decisions whether their questions were appropriate. The criteria for making judgements emphasized the correctness of meaning they needed to convey and of question forms.

#### 4. *Decision about what to do next*

As students posed and judged their questions, they might still fail to comprehend. To solve this problem, they might reread, form a pending question, or consult outside sources such as a teacher or classmates for an answer to that pending question.

- Stage 3: Post-reading activities  
The aims of the post-reading stage
- to enrich what has been read,
  - to retain what has already been read,
  - to relate the text to the readers' own knowledge.

Regarding the control group, all activities were entirely identical to those in the experimental group except that the control group was neither encouraged nor trained to ask their own questions.

The treatment was provided to both groups throughout one semester. Then, a self-generated question test was given to them in order to examine whether trained and untrained subjects could generate questions by themselves. At the end of the experimental phase, a post-test was administered to both groups; moreover, a questionnaire eliciting students' attitudes toward self-questioning was provided to only the subjects in the experimental group.

## Findings

This study found that :-

1. There was a statistically significant difference between the pre-test and post-test of students in the control group at the 0.05 level.
2. A statistically significant difference between the pre-test and post-test of students in the experimental group was found at the 0.001 level.
3. The mean score of the experimental group was significantly different from that of the control group at a confidence level of 0.001. The students in the experimental group did achieve higher mean scores than those in the control group. That is, students trained to generate their own questions made more improvement than those trained by a teacher's questions.
4. There was no statistically significant

difference on the English reading achievement test between good students in the experimental group and those in the control group ( $p > 0.05$ ) though the former's mean score of the former was higher than that of the latter. Average and weak students in the experimental group, on the other hand, made significantly greater improvements than those in the control group ( $p < 0.05$ ).

5. The mean scores of generating questions between trained students in the experimental group and untrained students in the control group were found to be significantly different ( $p < 0.001$ ). Trained students obtained a significantly higher mean score than untrained students.

6. For students' attitudes toward the self-questioning technique, most students responded with favorable attitudes toward this technique. Moreover, they self-evaluated to understand the lessons at the satisfactory level.

## Discussion

From Finding One, it was found that students in the control group enhanced their English reading achievement significantly through the practice of answering teacher-posed questions. This supports Tinsley (1973) who remarks that "through the use of effective questions and questioning by the teacher, students can participate in active involvement of their own learning" (Tinsley, 1973:710). The reason for this might be due to the effective questions asked by a teacher since the teacher as a professional question maker knows what important points should be asked leading to the main point. In this case, the investigator asked questions concerning content-related language functions. Thus, it may be concluded that students' English reading improvement results from the pertinent questions posed by the investigator.

According to Finding Two, the data reveal that students' English reading achievement could greatly be improved after practice in

the student-generated question technique. Through the experimental phase, students were trained to generate their own questions concerning language functions exhibited in the theme of reading passages. Whenever each language function is presented in sentences, students were required to pose questions corresponding to the perused statements. Before generating questions, students had to understand the statement clearly. This enabled them to retain information (Singer, 1978). This finding is in accordance with the study of Olson et al. (1982) conducted to examine the assumption that questioning and answering is an integral part of the process of reading comprehension. They (1982) found that the sentences that elicited many questions would be particularly salient to reading processing. They also suggested that one way to conceptualize reading processes is to consider each sentence in the text to generate certain questions and simultaneously to answer questions posed by previous sentences. This is so since each question may reflect a mental operation that the readers must carry out for the particular sentence as part of understanding it. Moreover, Olson et al. also stressed that as each sentence is understood and added to a growing representation of the story, the information gained from each sentence helps to make sense of the developing story. This information needs to interact with what is presented in the next sentence to generate a new set of informational needs -- or if you will, a new set of questions -- that guide the reader's comprehension through the succeeding parts of the text (Olson et al., 1982).

Supporting this view, Kisko and Iyortsuun (1982a) advocate that "learning is enhanced when pupils learn to ask their own Ref questions" (p. 118).

For these reasons, it can be concluded that students in the experimental group benefit from practice generating their own questions. Therefore, this technique is of value in teaching reading comprehension.

The results in Finding Three show that students trained to initiate questions by themselves outperformed those required to answer teacher-posed questions. This finding appears to be in accordance with the study of Nolte and Singer (1985) conducted with fourth and fifth graders. This result also supports Nolte and Singer's finding that student-generated questions surpassed teacher-posed questions. One reason might be due to the process of question asking that facilitates transfer of information gained from the text into long-term memory (Craik & Lockhart, 1972; Singer, 1979). Thus, students are more apt to memorize and use the information obtained from the text, and this rewards them for their question generating.

Another reason could be the effectiveness of self-questioning itself. This is so since self-questioning not only arouses students' interest and participation in self-directed learning (Marksberry, 1979) and expedites their perception and ability to think and express ideas on several levels (Singer, 1978; Marksberry, 1979) but also monitors, regulates, and heightens self-awareness of their comprehension (Nolte & Singer, 1985; Gavelek & Raphael, 1985; Davey & McBride, 1986). Furthermore, this technique familiarizes students with the cognitive and linguistic demands of question answering (Davey & McBride, 1986). That is, while practicing generating questions, students were exposed to linguistic forms and functions of the question words. When they faced the test items, they could understand the purpose of those test items and respond pertinently and correctly. This might lead them to improve more in English reading. Moreover, as students asked their own questions while reading the text, their questioning helped them organize and rehearse knowledge enabling them to comprehend the text and achieve the test items finally (Fishbein et al., 1990). Based on the effectiveness of the self-questioning study technique, it may be concluded that the use of self-questioning does

enrich students' comprehension. This finding, thus, is evidence to support a greater use of the self-questioning study technique.

Apart from the use of self-questioning itself, the reason for this finding could be the learning atmosphere. That is to say, self-questioning is a new activity for students in the experimental group. Thus, they were interested in learning through this technique, as far as the investigator was concerned. They had opportunities to participate in learning-teaching activities. Instead of answering questions passively, they were alert and activated to ask questions themselves. Moreover, they were motivated to remedy the inappropriate questions they posed. In other words, they were required to revise their mistakes until the correct ones were acceptable. This did not make them feel embarrassed when any errors occurred. It could be concluded that the new teaching technique as well as learning atmosphere was affective rather than formidable. Consequently, this may be one of the reasons that explain why students in the experimental group improved more in English reading achievement.

Students in the control group, in contrast, did not have any opportunities of exposure to the self-questioning technique. They could not monitor their awareness in order to hasten perception. They just answered a teacher's question rather than asked questions curiously. Concerning learning atmosphere, students attended a traditional way of teaching reading. That is, a teacher asked questions which students answered unavoidably. So, students' perception was restricted by the teacher's questions. In other words, what they would know was what the teacher asked. They might not think other than when the teacher asked questions. Moreover, when they were asked to read in order to answer questions, they might have created tension. They might have been worried about hesitant or unknown answers.

To sum up, the reasons why students in the experimental group significantly surpassed those in the control group might be due to the process of question asking, the use of self-questioning itself, and the learning atmosphere.

Students trained to ask themselves questions were superior to those answering a teacher's questions. Concerning Finding Four, it was found that low and average students in the experimental group achieved a significantly higher mean score than those in the control group. On the other hand, no statistically significant difference between good students of both groups was found. This finding was also identified by Andre and Anderson (1978-1979) who affirm that students with low and middle verbal ability benefited more from self-questioning training than those with high verbal ability. One explanation of this could concern the combinations of metacognitive and cognitive characteristics. According to Anderson (1979), the self-generated question technique may be an effective reading strategy because students were coerced to pause frequently, deal with understanding questions, determine whether comprehension has occurred, and decide what strategic action should be taken next. Thus, this technique fosters students to set purposes for study, identify and underline important parts of material, generate questions requiring answers, and think of possible answers to the questions.

These metacognitive and cognitive characteristics and their effectiveness may enable poor and average students to improve their achievement of learning since prior to possessing the self-questioning technique, they normally tend to be unaware of their lack of reading comprehension (Whimbey & Whimbey, 1975). That is, they do not self-monitor their state of reading comprehension. Moreover, poor readers with their passive learning style seem to be unaware of task demands and deficient self-questioning skills (Brown, 1980). Thus, when they were equipped to use this technique, they possessed metacognitive and cognitive

characteristics enabling them to set purposes of reading in mind, underline the main points of reading, ask themselves questions, and create the possible answers. Eventually, this technique leads poor readers to an active monitoring of the learning activity and to the engagement of strategic action to achieve reading comprehension (Anderson, 1979; Brown, 1979). This seems to be a plausible reason why poor readers profited from this technique.

However, the self-questioning study technique did not alter the performance of high verbal ability students. The reasons for this may be due to two factors. On the one hand, good readers already spontaneously monitor their own state of reading comprehension (Brown, 1980). They could understand the linguistic patterns leading to understanding of content. Thus, they might slightly profit from this technique. On the other hand, high verbal ability students might already have the component skills included in the self-questioning technique. Therefore, when they were trained to use this technique, it was redundant for them. For instance, when they were told to pause frequently in order to deal with understanding questions, they might have felt it tiresome because they already possess this technique automatically. Instead of hastening their thinking, this technique retards their process of reading. They, therefore, were not affected by the use of this technique.

Regarding another explanation, poor and good students in the experimental group might react to the generation of questions differently. As far as the investigator observed, poor students always wrote down some important things when their questions were revised, i.e. forms or functions of questions.

This repeated manner may engage them in deep processing and retain information more and more. This may help poor and average students in the experimental group gain more reading achievement than those in the control group. Unlike poor readers, good readers in the experimental group, who already have compe-

tency in question forms and functions, were apt to ignore noting anything. So they may not engage in deep reading processing. As a result, good students in the experimental group achieved approximately the same level of English reading achievement as those in the control group. This implies that the self-questioning study technique may benefit low and middle verbal ability students rather than high verbal ability students.

The results in Finding Five reveal that students in the experimental group could generate a significantly higher number of questions than did those in the control group ( $p < 0.001$ ). This indicates that trained students could ask more questions than did untrained students. Like Finding Three, this finding agrees with Olson et al. (1982). This probably results from the self-questioning training itself. Throughout the practice, trained students were required to generate questions corresponding to the sentences provided. Again, they had to make sense of stimulated sentences before converting them into questions. This enriches skills in generating correct questions. Untrained students, on the other hand, were told to answer questions posed by a teacher. They were neither instructed nor encouraged to initiate questions. Consequently, they could generate less questions than those trained to ask themselves questions.

The results revealed in Finding Six indicate that trained students generally responded with favorable attitudes toward the self-questioning study technique. This finding is consistent with Thistlethwaite (1983). He found that the self-questioning strategy was evaluated positively by the subjects at the end of the teaching unit. Concerning this finding, students stated that this technique was beneficial for them. It activated them to think before reading other details. Most of them agreed that this technique enabled them to concentrate on reading passages, acquire the main points of reading, clarify any ambiguous contents, and participate

in learning activities. Regarding grammar usage, students had an opportunity to review forms and functions of questions. Moreover, they could memorize the previously learned passages. Most said they felt enthusiastic and confident in reading and finally they could comprehend the text.

Concerning limitations, the self-questioning study technique is not regarded as a useless one. It did not consume much class time. It neither retarded reading nor made readers disregard the content. In short, it was viewed as a practical technique. Furthermore, students recommended that they should either practice more by themselves or be trained more by a teacher. Moreover, pair work and group work activities were demanded for practice. Apparently, they needed more time for practice in a variety of content.

Therefore, this finding serves as an indication that the self-questioning study technique is regarded as an auspicious technique assisting students in comprehending the text. This also provides evidence to support several attempts that unanimously affirm that this technique is a vital tool for acquiring knowledge (Singer, 1978; Marksberry, 1979; Andre & Anderson, 1978-79; Gavelek & Raphael, 1985; Nolte & Singer, 1985; Davey & McBride, 1986; Zaher, 1987; Fishbein et al., 1990).

### **Implications for Teaching and Learning**

This study was designed to compare two different questioning techniques for the teaching of English reading, viz, student-generated question and teacher-posed question techniques. Taken together, the findings from this study point to overall positive effects of training in the self-questioning study technique. Consequently, it is likely to be worthwhile to unite this technique and the teaching of English reading together. In the light of the findings of this study and other related studies, the investigator would propose the following sug-



gestions.

Based on the findings, it can be concluded that the self-generated question technique activating students' thinking and enhancing students' retention of information is more effective for teaching English reading than a traditional technique leading students to answer inactively. In recognition of this fact, teachers of English reading should equip students to be independent readers. That is, teachers should train students to generate their own questions while reading. Basically, teachers should instruct students to be sensitive to important parts of the text by asking questions such as "What is the theme of this passage?" Moreover, they should also guide students to monitor their state of reading comprehension by asking questions such as "Is there anything I don't understand in this passage?" Such self questioning assists students to heighten their self awareness when they encounter a difficulty in reading.

The findings in this study indicate that weak and average students greatly benefited from the self-questioning study technique. They improved most in the level of English reading achievement after practice in posing their questions. This was also supported by Andre and Anderson (1978-79) who point out that low verbal ability students profit most from question generation. Hence, it is worthwhile to train poor and average students to monitor themselves by asking their own questions enabling them to be aware of their state of reading comprehension.

Several educators suggest that students should ask their own questions in reading activities since questions assist them to comprehend the text and retain information. Finally, they can be independent readers (Singer, 1978; Nottle & Singer, 1982; Singer & Donlan, 1982). For this reason, questions enabling students to be independent readers may be useful for English teachers who always assign students some external reading activities. That is to say, in reading courses, students are usually assigned to read a great deal of outside reading. Thus, independent readers can effectively deal with outside reading activities because they know how to monitor their comprehension and retain the target information. That is, they ask their own questions before reading in order to predict what will happen in the text. Moreover, they can generate questions while reading in order to activate their thinking. They, in the same way, pose their own questions after reading so as to review the content or monitor their level of reading comprehension. In conclusion, the self-questioning technique may be beneficial for both English teachers who assign external reading activities and students who have to do a large number of those activities.

**Note :**

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## References

- Anderson, T. H. 1979. Study Skills and Learning Strategies. In *Cognitive and Affective Learning Strategies*. Edited by Harold F. O'Neil, Jr. and Charles D. Spieberger. The Educational Technology Series, Academic Press
- Anderson, T. H. 1979. Study Strategies and Adjunct Aids in *Theoretical Issues in Reading Comprehension*. Edited by Rand J. Spiro, Bertram Bruce and William F. Brewer Hillsdale. N.J. Erlbaum
- Andre, Marli E.D.A. & Thomas H. Anderson 1978-79. The Development and evaluation of a self-questioning study Technique. *Reading Research Quarterly*. 14(4) : 606-623
- Aumpayub, S. 1990. An Experimental Study of the Effectiveness of the Student Generated Question Technique on Reading Achievement of the First-Year Nursing Students at Mahidol University. *Unpublished Master's Thesis*. Mahidol University.
- Brown, A. L. 1979. Metacognitive Development in Reading in *Theoretical Issues in Reading Comprehension*. Edited by Ran J. Spiro. Bertram Bruce, and William F. Brewer Hills Dale, N.J. : Enlbaum.
- Craik, F.I.M. & R.S. Lockhart. 1972 Levels of processing : A Framework for memory research : *Journal of Verbal Learning and Verbal Behavior*. 11 : 671-684.
- Davey, B. and S. McBride. 1986. The effects : of question generation training on reading comprehension. *Journal of Education Psychology*. 256-262.
- Fishbein, H.D. et al. 1990 Learners' Questions and Comprehension in a Tutoring Setting. *Journal of Educational Psychology*. 82 : 163-170.
- Gavelek, J.R. and T.E. Raphael. 1985. Metacognition instruction, and the role of questioning activities. In *Metacognition, cognition and human performance*. Edited by D.L. Forrest - Pressley, G. E. Mackinson and T.G. Waller Orlando, FL : Academic Press.
- Kissock, C. & Iyortsum, P. 1982 a. *A Guide of Questioning : Classroom Procedures for Teachers*. Macmillan Publishers.
- Marksberry, M. L. 1979. Student questioning : An instructional strategy. *Educational Horizons*. 57 : 190-196.
- Nolte, R.Y. and Singer, H. 1985 Active comprehension : Teaching a process of reading comprehension and its effects on reading achievement. *The Reading Teacher*. 19 : 24-31.
- Olson, G.M. et al. 1982. On line questions asking as a component of story comprehension. *Paper presented at the Annual Meeting of the American Educational Research Association*. New York.

- Sangakit, L. 1990. A Survey of Instruction Received in Using English Reading Strategies of First Year Medical Students. *Unpublished Master's Thesis*. Mahidol University
- Singer, H. 1978. Active Comprehension : From Answering to Asking Questions. *The Reading Teacher*. 31(8) : 991-995
- Singer, H. & Donlan, D. 1982. Active Comprehension : Problem Solving Schema with Question Generation for Comprehension of Complex Short Stories. *Reading Research*. Quarterly. 17(2) : 166-186.
- Singer, R. N. & Gerson, R.F. 1979 Learning Strategies, Cognitive Processes, and Motor Learning. In *Cognitive and Affective Learning Strategies*. Edited by Harold F. O'Neil, Jr. Academic Press.