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# Student Ability in Identifying Reasons for Different Points of View: A Learning Activity Conducted with a Group of Japanese High School Students

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Problem solving as a skill is emphasized within the revised Japanese Course of Study for schools. This experimental study, conducted among Japanese high school students, evaluates an effort to develop student ability to identify reasons for *different* points of view, not just personally favored views. First, the ability of all students was tested using a reading literacy question from the 2000 PISA test, which measures the reading skills of evaluation and reflection. The experimental group then participated in a developmental learning activity. After the activity, all students were retested using the same PISA question. Nothing conclusive was found regarding the general effectiveness of the lesson activity, but two insights were gained. It was found that student self-awareness of the importance of the learning task and interactive learning are important to consider.

Key Words: problem solving, identifying reasons, different points of view, PISA, Japanese education

Are all sides being heard? How credible is the information provided? Is it fact or opinion? Does it represent various points of view? What biases exist? We need to critically examine and evaluate different points of view and information provided in solving problems and making decisions. Critical thinking is needed. Critical thinking is the ability to make rational decisions about what to do or what to believe (Marzano, 1995). Critical thinking "is used to describe thinking that is purposeful, reasoned, and goal directed" (Halpern, 1996, p. 5).

Successful problem solving requires looking at things from different points of view. Listening and reading critically while systematically evaluating what you have heard and read (Browne & Keeley, 2001) leads to understanding things from divergent perspectives.

Identifying reasons for differing perspectives is a particularly important step in critical thinking. "Focusing on reasons requires us to remain open to and tolerant of views that might differ from our own" (Browne & Keeley, 2001, p. 28). Reasoning to solve real life problems --- "everyday reasoning" (Perkins, 1989; Perkins, Farady & Bushey, 1991), "informal reasoning" (Perkins, Farady & Bushey, 1991; Galotti, 1989; Khun, 1991) or "argumentative reasoning" (Khun, 1991; Khun, Shaw & Felton, 1997) --- is a fundamental critical thinking skill.

Errors in everyday reasoning are due to two significant shortcomings: "metacognitive shortfall" and "confirmation bias" (Perkins, 1989). The first is lack of the ability to reflect on one's own thoughts. The second is "paying attention to information that [only] confirms one's own belief" (Samaan, 2004, p. 20). "A confirmation bias consists of ignoring

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alternative accounts" (Koslowski, 1996, p. 261). Perkins associates confirmation bias with a preference for constructing and maintaining simple, one-sided pictures. Perkins argues that such a bias arises for two main reasons. The first is ego defense: people do not want to examine their deep-rooted beliefs too closely. The second is a natural tendency to minimize "cognitive load," in which weighing conflicting arguments and coming to a single conclusion require substantial cognitive effort (Garnham & Oakhill, 1994). Bias due to the inability to see a problem from a fresh perspective (Samaan, 2004) and confirmation bias are related barriers to reasoning.

Mature opinion formation rests on first understanding and evaluating alternative points of view (Browne & Keeley, 2001). It is crucial in the development of problem solving skills that students learn how to recognize differing points of view, to argue, and to evaluate multiple arguments, not just arguments supporting their own point of view.

In has been the goal of Japanese education for some years now to reform teaching and learning methods in primary and secondary schools to focus more on equipping students with problem solving skills rather than to continue emphasizing didactic and practice models of instruction (Ministry of Education, Science, Sports and Culture, Japan, 1998 a, 1998 b, 1999). This study evaluates an effort to develop more cognitively mature reasoning and opinion formation. It is concerned with student improvement in cooperating multiple perspectives in thinking. It was hypothesized that student ability to identify reasons for *different* points of view, not just a personally favored view, would be improved and that there would be a positive correlation between student awareness of the ability and performance.

### *Basic Principles of the Study*

Slavin (2000) points out "Effective teaching of critical thinking depends on setting a classroom tone that encourages the acceptance of divergent perspectives and free discussion" (p. 283). Anderson and Soden (2001) mention, "From a practical perspective, a clearer message emerges that peer interaction is indeed a potentially useful method for engaging students in the exercise necessary for inculcating critical thinking skills" (p.39).

Referring to Dewey (1910) and the National Education Association (1961), Kuhn, Shaw and Felton (1997) write that the most effective way to improve student thinking skills is to provide frequent opportunities for them to practice. Furthermore, Anderson and Soden (2001) note Kuhn's suggestion (1991) that peer-based practice would be effective in improving thinking skills. The authors also point out that interactive student learning activities should be carefully structured and spread out over several sessions.

The review mentioned above points out the crucial role of peer interaction in improving student critical thinking. Peer interaction practices including free discussion are, however, still limited in Japanese classes. Generally, Japanese students have been exposed to presentation practices much more than to two-way communication, or interactive learning since their primary schooling (Nu Nu Wai & Hirakawa, 2001). Under the revised Course of Study (Curriculum Guidelines), student group work practices are more evident. The practical limitations and background situation were taken into account in designing the learning activity for this study.

## Method

### *Overall Procedure*

The study was conducted with four science classes of 15 to 16-year-old First Grade (Grade 10) high school students at Saijo Agricultural High School, Higashi-Hiroshima City, Japan in January - March 2004. Among six classes of that Grade, two classes that were being taught by the school teacher cooperated in this study were chosen as an experimental group while the other two classes which could participate in it were picked up as a control group. 43 males and 35 female students were in the experimental group (39 students each in the two classes). 35 males and 45 female students were in the control group (40 students each in the two classes).

A question measuring reading literacy in PISA (the OECD Program for International Student Assessment, 2000) testing was used for pre- and post-testing. The question measures the reading skills of evaluation and reflection. Students are required to read a story and respond to question items asking them to provide reasons (evidence) found in the narrative to justify two possible different points of views about the character in the story (see Appendix). After the pretest, the experimental classes, guided by the same teacher, participated in the developmental learning activity described below. The control group simply continued with its normal course of study. After the experimental classes completed the developmental exercise, a posttest using the same PISA test question was administered to all classes.

The learning activity was conducted over eleven 50-

minute class periods. In the activity, students were organized in teams of four to five students. The teams were then paired to make opposing presentations before their classmates. For example, one pair made persuasive presentations on the nutritional and societal roles of fast food versus traditional "home cooking". Other topics covered included:

1. Local versus mass production and consumption;
2. Natural versus genetically-modified foods;
3. Recycling versus high consumption behavior.

Teams were formed based on student interest. Before each team gave its presentation, the members collectively gathered and analyzed data, prepared posters and handouts, and rehearsed. The teacher encouraged peer interaction as each group prepared its presentation.

On the day of the presentations, when not themselves presenting, students were instructed to evaluate their classmates' presentations on topics other than their own. They were instructed to list, on the worksheet provided by the teacher, all of the arguments presented by *both* teams on each topic in support of their respective points of view and finally to decide which position they favored. Each student thus evaluated presentations on three other topics.

The teacher underscored the importance of the learning activity. Immediately following the presentations, she provided feedback to the students, pointing out the importance of being able to identify the reasons supporting *both* points of view. Again, when the teacher reviewed the lesson during the next class period, the students were encouraged to appreciate the importance of examining the reasons and supporting evidence for different points of view. After this teacher feedback was provided, student self-awareness of this point was measured by a battery of three questions[1].

### *Data Analysis*

An independent-samples *t*-Test was used to reveal any group difference between the experimental and control groups in pretest scores. A Pair *t*-Test was used to find out any significant difference between pretest and posttest scores. A Chi-square Test was used to test the significance of the relationship between posttest scores and student self-awareness of the importance of having the ability. Descriptive statistics were used in the rest of the analysis.

## Findings

### *Finding 1*

There was no significant difference between the experimental and control groups in pretest scores (see Table 1). This result implies that at the beginning of the study both groups had more or less the same ability in identifying reasons in the attempt of coping with different perspectives.

Table 1. *A Comparison of Experimental and Control Groups in Pretest Scores*

| Group | Mean Score | N | *t* |
|---|---|---|---|
| Experimental | 1.59 | 63 | 1.548 |
| Control | 1.41 | 70 | |

Note: N (Experimental) = Students who participated in learning activity and in pretest and posttest. N (Control) = Students who participated in pretest and posttest.

### *Finding 2*

This finding reports on student ability to identify reasons for *different* points of view after listening to their classmates' presentations taking opposing stands on each of three topics. Slightly more than half (52.1% [N = 73]) of the students were biased toward identifying the reasons supporting the point of view they themselves favored. Very few students (5.5%) were successful in identifying all arguments on both sides of the issues, and the rest (42.5%) were biased in their selection toward those issues *against* their own position (see Table 2).

Table 2. *Number and Percentage of Students in terms of the Nature of Performance in Evaluating Three Topics which Their Classmates Presented (N = 73)*

| Nature of Performance | Number & Percentage of Students |
|---|---|
| Bias toward personally favored points of view | 38 (52.1%) |
| Bias toward the issues against student own position | 31 (42.5%) |
| No bias (Success in identifying all arguments on both sides of issues) | 4 (5.5%) |

Note: Total number of students in the experimental group who evaluated all of the three topics that their classmates presented is 73.

***Finding 3***

There was no significant difference between pretest and posttest scores of the experimental group students. Ironically, there *was* a statistically significant increase in the scores of the control group (see Table 3).

Table 3. *A Comparison of Student Pretest and Posttest Scores*

| Group | Test | Mean Score | N | *t* |
|---|---|---|---|---|
| Experimental | Posttest | 1.76 | 63 | 1.957 |
| | Pretest | 1.59 | | |
| Control | Posttest | 1.70 | 70 | 3.209* |
| | Pretest | 1.41 | | |

Note: N (Experimental) = Students who participated in learning activity and in pretest and posttest. N (Control) = Students who participated in pretest and posttest
* $p < 0.01$

***Finding 4***

A statistically significant relationship was found between student performance in the posttest given after the learning activity and *student self-awareness* of the importance of having the ability actively promoted by their teacher. Three-quarters of the students who achieved full scores (100%) on the posttest had a high level of awareness whereas lower-scoring students were much less aware (see Table 4).

Table 4. *A Statistically Significant Relationship between Posttest Scores and Student Self- Awareness of the Importance of Having the Ability*

| Posttest Scores | High Self-Awareness | Low Self-Awareness | N | $\chi 2$ (*df*) |
|---|---|---|---|---|
| Full Score | 35 (74.5%) | 12 (25.5%) | 47 | 18 (2)* |
| Half Score | 4 (36.4%) | 7 (63.6%) | 11 | |
| Zero Score | 0 (0%) | 1 (100%) | 1 | |

Note: 1) Self-awareness was measured by a battery of three questions (see the procedure above). "High self-awareness" reflects a 100% positive response to the questions probing student awareness and motivation while "Low self-awareness" reflects a *not* 100% positive response to it. 2) Total number of students in the experimental group who responded to the posttest as well as questions measuring self-awareness is 59.
* $p < 0.01$

## Discussion

Since the school tracks its students by ability level in classes, the success of the research was constrained by limited control in studying students by ability level. The control group comprised higher ability students than those in the experimental group. It was not possible to compare changes between higher and lower ability students in either group. There is no explanation for the progress from pre- to posttest found among students in the control group. At the beginning of the study, both the control and experimental groups had more or less the same ability in incorporating different perspectives in thinking. It can therefore be said that if the developmental effort was actually effective, significant improvement would have been seen among lower level students. But no significant effect of the instructional method was found among those students in practice. In short, nothing conclusive was found regarding the general effectiveness of the lesson activity used in this case, but there was a statistically significant difference in the posttest between students with high awareness of the ability and those with low awareness; that is, between motivated and unmotivated students. Higher scorers were more aware. Apparently, it might be productive to motivate students by emphasizing the importance of the ability they are trying to master.

Another insight was gained through this experiment. In future, the experimental design could include more opportunities for interactive learning. It might be said that, in this case, there was not enough "medicine" to effect a "cure." The learning activity involved relatively limited student interaction since it was restricted to internal team preparation. Otherwise, the students simply made lists of the arguments for and against after listening to their classmates' presentations without any discussion or interaction which might have increased awareness significantly of differing points of view and arguments for and against various propositions. Additionally, lacking general class discussion time, there was limited peer stimulation of the importance of the learning task, just encouragement from the teacher.

It seems reasonable to continue along this line of inquiry in developing student skills of metacognitive awareness and reducing confirmation bias despite the problems encountered in this study. The study findings and other considerations discussed above suggest further investigation into the development of the ability to identify reasons for different points of views by, first, modifying the learning method to include more interactive opportunities and, second, adding increased emphasis upon and opportunities for metacognitive reflection.

**Notes**

1. When you have listened to various presentations of your classmates, how much important is it for to present reasons supporting their point of view?
   a) very important b) important c) not very important d) not important at all
2. When you have listened to various presentations of your classmates, how much important do you think it is that students base their presentations on reliable data/evidence?
   a) very important b) important c) not very important d) not important at all
3. Two different points of view were presented on each topic. Do you think you could understand the reasons presented for each point of view?
   a) I understood the reasons for both points of view and then I could make my own judgment.
   b) I only understood the reasons for the point of view with which I agree.
   c) I could not understand the reasons presented for either point of view.

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