Relationship between thinking styles and ability to pay attention of Malaysian male and female student teachers

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Abstract

Previous studies have produced inconsistent evidences on the relationship between creative thinking, critical thinking and the ability to pay attention on learning stimuli of male and female students. Hence this study was conducted to identify the relationship between thinking styles and the ability to pay attention; thinking styles and gender; and the ability to pay attention and gender of Malaysian student teachers. Two instruments, the YCREATIVE-CRITICALS test and the Attention Ability Test, were utilized to collect data from a group of student teachers (n=144). Results indicate that critical thinking style was positively correlated with the ability to pay attention while creative thinking was negatively correlated with it. The male subjects were more creative but less able to pay attention to learning stimuli than their female counterparts. The findings implied that attempts should be made to move away from the current rote learning approach used in educational institutions towards interactive teaching methods to accommodate the more creative but less attentive males.

1. Introduction

Statistics has shown that females outnumbered the males not only in the teaching profession, but in various other fields of studies (Hamidah, 2009; Sheeran, 2008). Some scholars have also suggested that there might be differences between the males and females in thinking and learning abilities. For examples, Kousoulas & Mega (2008) and Kim & Micheal (1995) provided evidence that there was a significant correlation between either critical or creative thinking with gender. Chief & Shallcross (1992) suggested that males and females have different paying attention abilities. However, some studies reported that there was no correlation between gender with critical thinking (Robert & Karren, 1995; Pearson, 1991) as well as creative thinking (Sanford, 1983; Katiyar & Jarial, 1983).

Paul (1995) and Piaget (1970) claimed that the ability to pay attention to the central point of a problem before imposing standards and criteria on the thinking process, and using them to construct thinking are associated with critical thinking. However, other researchers have argued that creative thinking is correlated with the ability to pay attention. According to these researchers (Davis, 1992; Khatena, 1992), one of the personality attributes of the

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A creative person is sensitiveness to sensory stimulation. Therefore, creative person possesses high power of focusing mentally on stimuli in order to understand the problem. Likewise, Michalko (2006) argued that before someone can become creative in producing ideas, he must demonstrate enhanced ability to pay attention to stimuli.

The above review of literature depicted inconsistent of evidences and statements on the relationship between the two types of thinking and the ability to pay attention on learning stimuli. In view of the wide diversity of the previous studies, this study was conducted to identify the relationship between (1) thinking styles and the ability to pay attention; (2) thinking styles and gender; and (3) the ability to pay attention and gender.

2. Methods

The study utilised a quantitative survey design. Two paper-and-pencil psychological tests were used to collect data from the subjects of the study.

2.1. Sampling Procedure

The subjects consists of 144 student teachers (52 males and 92 females, average age: 20 years), randomly selected from a teacher training institute in Malaysia. The subjects were selected based on a power analysis. According to some statisticians (Cohen, 1969; Chua, 2006), selecting a representative sample of the population is better than having a large but biased sample, which would lead to erroneous statements about the population. Hence, to control and balance the type I and type II errors, a 4:1 ratio, as suggested by Cohen was referred, that is, the power of .80 at the .05 level of significance. Based on the ratio and past research pertaining to relationships among thinking styles, ability to pay attention and gender, the researcher postulated a small effect size. Therefore, based on the Sample Size Table (Cohen, 1969: 377), the sample size needed for the study was 144.

2.2. Instrumentation

The researcher utilised two instruments for data collection. First, the Yanpiaw Creative-Critical Thinking Style Test (YCREATIVE-CRITICALS) (Chua, 2004), consisting of 32 multiple-choice items, was used to collect data concerning creative and critical thinking styles of the subjects. Each item of the test provided the subject with choices, representing either the function of creative thinking style or critical thinking style. The subjects were asked to select the answer that best reflected and described their own typical thinking and behaviours (Chua, 2003).

In a pilot test, with a size of 30 students, the YCREATIVE-CRITICALS Test yielded high construct validity. The scores of creative thinking style of the YCREATIVE-CRITICALS Test correlated positively with creative thinking index \( r = .69, p< .01 \) of the Torrance Test of Creative Thinking (Torrance & Ball, 1984). Meanwhile, the scores of critical thinking style of the YCREATIVE-CRITICALS Test correlated positively with critical thinking index \( r = .65, p< .01 \) of the Watson-Glaser Critical Thinking Appraisal or WGCTA (Watson & Glaser, 1980). Besides that, the test-retest reliability for the YCREATIVE-CRITICALS Test in a range of three months is .89.

Second, the Attention Ability Test or AAT (Chua, 2008) (see Figure 1) was used to identify the subjects’ ability to pay attention to learning stimuli. The AAT comprised eight alphabets (X, Y, K, H, A, Z, N and M) which were randomly assigned into rows. The subjects were asked to pay attention to the alphabets, to find and circle any K alphabet that occurred two alphabets before Z (for example, KAZ and KNZ), and circle any A that was located two alphabets before X (for example, AKX and AYX). Any subject making more than 25 mistakes was labelled as having a low attention span; the subject with 18 to 25 mistakes was classified as having an average ability to pay attention, while those with less than 18 mistakes were considered to have a high level of attention ability. By using the same sample of subjects as the pilot test, the test-retest reliability for the AAT test in a range of three months was .87.

The subjects of the study answered the two tests individually in a classroom setting under the invigilation of the researcher. The time allocated for each of the YCREATIVE-CRITICALS Tests and the AAT Test was 25 minutes.
3. Results

3.1. Relationship between thinking styles and attention ability

The data in Table 1 shows that there was a significant difference among the three groups in creative thinking style. It shows that subjects with high creative thinking ability possessed low attention ability. On the other hand, subjects with low creative thinking ability tend to have high attention ability (creative thinking style: high attention ability, M=21.45, SD=3.18; average attention ability, M=23.71, SD=2.71; low attention ability, M=29.54, SD=2.45; F(2, 141)=538.14, p<.05). The results indicate that the two variables were correlated negatively.

There were also significant differences among the three attention ability groups in critical thinking style (critical thinking style: high attention ability, M=30.10, SD=2.58; average attention ability, M=21.59, SD=2.31; low attention ability, M=17.34, SD=2.03; F(2, 141)=439.69, p<.05). The results indicate that the high attention ability group possessed the highest critical thinking style scores, followed by the average and low attention ability groups. This means that critical thinking style was positively correlated with the ability to pay attention. The Post Hoc Tukey’s HSD Multiple Comparisons results detailed the significant differences in critical and creative thinking styles among the three attention ability groups.

Table 1. ANOVA test results for creative and critical thinking styles according to attention ability

| Thinking style | Attention ability | M    | SD   | F(2, 141)   | Significant difference (Tukey HSD)   |
|----------------|-------------------|------|------|-------------|--------------------------------------|
| Creative       | Low               | 29.54| 2.45 | 538.14**    | 1–3                                  |
|                | Average           | 23.71| 2.71 |             |                                      |
|                | High              | 21.45| 3.18 |             |                                      |
| Critical       | Low               | 17.34| 2.03 | 439.69**    | 1–3                                  |
|                | Average           | 21.59| 2.31 |             |                                      |
|                | High              | 20.10| 2.58 |             |                                      |

Note: ** significant at p < .01

3.2. Relationship between thinking style and gender

The data in Table 2 indicates that there were significant gender differences in thinking styles. The male subjects outperformed their female counterparts in creative thinking [male: M=27.09, SD=4.66; female: M=24.12, SD=5.18; F(1, 142)=215.31, p<.05]. On the other hand, the female subjects outperformed their male counterparts in critical thinking [male: M=23.39, SD=3.71; female: M=27.34, SD=3.98; F(1, 142)=232.16, p<.05].
Table 2. Results of ANOVA test for the differences in creative and critical thinking styles according to gender

| Thinking style | Gender  | M     | SD  | F(1, 142)  |
|----------------|---------|-------|-----|------------|
| Creative       | Male    | 27.09 | 4.66| 215.31**   |
|                | Female  | 24.12 | 5.18|            |
| Critical       | Male    | 23.39 | 3.71| 232.16**   |
|                | Female  | 27.34 | 3.98|            |

Note: ** significant at p < .01

3.3. Relationship between attention ability and gender

The data in Table 3 show that there is a significant gender difference for number of attention mistakes made [the attention mistakes made: male, M = 24.17, SD = 2.31; female, M = 30.35, SD = 2.58; F(1, 142) = 184.14, p< .05]. It indicates that significantly, the male subjects made more mistakes and hence they were less able to devote attention to learning stimuli compared to the female subjects (see Figure 3).

Table 3. ANOVA results of the number of mistakes made due to lack of attention according to gender

| Variable        | Gender  | M     | SD  | F(1, 142)  |
|-----------------|---------|-------|-----|------------|
| Attention       | Male    | 24.17 | 2.31| 184.14**   |
| Mistakes        | Female  | 20.35 | 2.58|            |

Note: ** significant at p < .01

4. Discussion

The results of this study indicate that male subjects exhibited a more creative thinking style and they were less able to pay attention to learning stimuli, while female subjects demonstrated a more critical thinking style and they showed better ability to pay attention. The results support the works of Michalko (2006) and Ready, LoGerfo, Burkam & Lee (2005). The male and female subjects demonstrated inverse thinking styles and different abilities to devote attention to learning stimuli. The fact that the Malaysian’s education system (and perhaps that of other countries) is currently still exam-oriented, emphasizes rote learning and critical thinking strategies, and employs structured teaching and learning techniques (Koh, 2009); means that the learning environment in the educational institutions tends to directly or indirectly favours the females and does not really accommodate the males. It indirectly explains why the females are dominating most fields of academic studies.

The findings of this study imply that there should be a shift in the traditional rote learning and teaching strategies used in teacher training institutes towards a more innovative approach to accommodate the creative but low attention ability male student teachers. If nothing is done to accommodate the learning styles of the males, they will shy away from education. Therefore, for the sake of male students, school should create a fun learning environment so that the creative males can survive, participate and thrive in the world of education.

Besides that, since paying attention is a learnable skill (Jackson, 2008), further research could be conducted to identify ways of overcoming learning and attention barriers and improving the male student teachers’ critical thinking abilities. This might help defer the decline to extinction of males in the teaching profession as well as other fields of excellence.

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