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Thinking styles: A study on secondary school students

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ABSTRACT

Thinking Styles is a concept used in cognitive psychology to describe the way individuals think, perceive, and remember information. Styles should not be confused with abilities. Style is the way we prefer to use the abilities to process information, solve problems etc. The article is based on Sternberg's theory of mental self-government. The objectives of the study were to find out the preferred thinking styles of secondary school students under the five dimensions namely functions, forms, levels, scope, and leaning and also to find out whether there was any significant difference in thinking styles based on gender. The thirteen styles are legislative, executive and judicial functions; hierarchic, monarchic, oligarchic, and anarchic forms; global and local levels; internal and external scopes; and liberal and conservative leanings. The results showed that under each dimension, a particular style of thinking was preferred. The study revealed executive, hierarchic, local, external and conservative thinking styles as more preferred under the dimensions of functions, forms, level, scope and leanings respectively. The styles of thinking were also influenced by the demographic factor gender. The preference for each style varied for boys and girls. The study was done with an intention of making the students aware of the styles that help them to gain a sense of self-efficiency and also to help the teachers to teach students to capitalize upon their strengths and take steps to remediate and compensate for their weaknesses.

KEYWORDS: Thinking Styles, Mental Self-Government, Functions, Form, Scope, Level, Leanings

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INTRODUCTION

Education worldwide is changing, and thus the preference given to classroom learning alone has been replaced by constructive learning in which learners are not just passive listeners. Although human beings share many important characteristics, they also differ from one another in significant ways. To understand, or apply one has to employ the powers of thinking. The way in which an individual thinks or perceives a problem has come across a drastic change due to the rapid growth of science and technology. Innovations, new developments and solution to issues emerge as a result of creativity and curiosity-driven approaches. Individuals vary along such dimensions as intelligence, ability, gender, styles of thinking and learning etc. The more the world becomes modern, the more complicated it becomes for the educators to bring out the best education model.

Need and significance of the study

Every individual has his or her own preferred way of thinking and learning which psychologists referred to as styles. All styles are adaptive under the right circumstances. Styles are preferences not fixed modes of behaviour. Since a typical classroom contains students who exhibit several styles of thinking, teachers must be flexible and must learn to address every students' style. This will help the teachers to address individual differences. By knowing the preferred styles, a teacher can give differentiated instruction using different learning materials, instructional strategies and activities. Research from developmental and cognitive psychologists had found that high school students can handle more abstract and complex tasks and have a strong need of both autonomy and social contact. It is important to foster the perception that the purpose of education is personal development. Therefore, a special effort to establish a supportive atmosphere in which students can meet their social, emotional and cognitive needs is essential. If education in schools, fail to provide students with an intellectually challenging environment, the result is a negative effect on motivation. Mastery goals have been associated with awareness and positive feelings about one's abilities, style preferences etc. The secondary school years mark the period of changes and development. Cognitively, students become more capable. By knowing their style of thinking, a teacher can help them to develop and adopt different ways of thinking as the situation demands. The identification of one's preferred styles helps the individuals to capitalise on their strengths, compensate for their weaknesses, learn how to adapt, to decide accurately, to be motivated and to achieve success.

Theoretical framework

Robert Sternberg has put forth (1994) a thinking style theory that is modelled on the different functions and forms of government (Snowman & McCown,2011). It is referred to as styles of mental self-government theory to understand different styles that individuals use in various settings. The

theory comprises of thirteen mental self-government styles which fall into one of the five categories namely functions, forms, levels, scope and leaning. The thirteen styles are legislative, executive and judicial functions; hierarchic, monarchic, oligarchic, and anarchic forms; global and local levels; internal and external scopes; and liberal and conservative leanings. Each person prefers a style within each category. The teachers can adopt the type of instruction students prefer and assign activities accordingly thereby giving the opportunity to use all styles at one time or another. The main characteristics of each style are briefly described below.

Table 1: Characteristics of the Thirteen Thinking Styles

Styles	Characteristics
Legislative	Prefers to formulate rules and plans, imagine possibilities and create ideas and products.
Executive	Prefers to follow the rules and guidelines.
Judicial	Prefers to compare things and make evaluations about quality, and effectiveness.
Hierarchic	Prefers to have several tasks to work on, deciding which one to do first, second etc. and for how long.
Monarchic	Prefers to work on one task at a time or to use a particular approach.
Oligarchic	Prefers to have several tasks to work on, all of which are treated equally.
Anarchic	Prefers an unstructured, random approach that is devoid of rules, or procedures.
Local	Prefers to identify and work on the details of a particular part of a task before moving to another.
Global	Prefers to have an overall view of a task before beginning work.
Internal	Prefers to work alone.
External	Prefers to work with others.
Liberal	Prefers to work out own solution to problems.
Conservative	Prefers to do things according to established procedures.

OBJECTIVES

1. To find out the most preferred thinking styles of secondary school students under the five dimensions namely functions, forms, levels, scope and leaning.
2. To find out whether there is a significant difference in thinking styles based on gender.

EXPERIMENTAL SECTION

Methodology

The present study has employed a survey method. The analysis was done on a sample of 50 students of class IX from Kerala giving due representation to gender. Thinking Styles Inventory developed and standardised by Gafoor and Lavanya (2007) was used as the tool for the study. The inventory was developed based on the theory of Mental Self-Government by Sternberg (1997) which assesses five dimensions of thinking functions, forms, scope, level and leanings. Each dimension has its own component thinking styles. The component thinking styles include legislative, executive, and judicial functions; hierarchic, monarchic oligarchic, and anarchic forms; global and local scope; internal and external levels; liberal and conservative leanings each of which has a separate score. The

reliability coefficients (0.69 - 0.97) and validity coefficients (0.59 – 0.72) for each of the component thinking style was found to be sufficient enough for the tool to be used for studying the thinking styles. The inventory as a whole has no total score.

Using statistical techniques, data was analysed. The thinking styles were studied using the mean, standard deviation and t-test for comparison of thinking styles between boys and girls.

Findings

The preferred thinking style was found out under each of the five dimensions using mean, standard deviation scores and comparing the mean score of thinking styles (paired t-test) under each dimension. The t-test was used to find whether there is any significant difference between boys and girls among the components of thinking styles.

Table 2: Mean, and Standard Deviation scores of thirteen component thinking styles under the five dimensions.

Dimension	Thinking Style	Mean	Standard Deviation
Function	Legislative	2.94	1.731
	Executive	4.50	1.460
	Judicial	2.58	1.357
Forms	Hierarchic	3.90	1.488
	Monarchic	3.74	1.549
	Oligarchic	1.26	1.006
	Anarchic	1.10	1.055
Level	Local	16.34	5.208
	Global	15.54	5.183
Scope	Internal	14.42	4.803
	External	25.58	4.803
Leanings	Liberal	19.64	3.942
	Conservative	20.30	3.845

Table 3: Scores of paired comparisons of means of components of thinking styles under each dimension

Dimension	Paired variables	Paired Difference in Mean	t	Sig(2-tailed)
Function	Executive-Legislative	1.560	3.793	.000
	Legislative-Judicial	0.360	0.927	.358
	Executive-Judicial	1.920	6.139	.000
Form	Hierarchic-Monarchic	0.160	0.422	.675
	Hierarchic – Oligarchic	2.640	9.160	.000
	Hierarchic –Anarchic	2.800	9.610	.000
	Monarchic-Oligarchic	2.480	8.343	.000
	Monarchic-Anarchic	2.640	8.588	.000
	Oligarchic-Anarchic	0.160	0.760	.451
Levels	Global-Local	0.800	0.545	.588
Scope	External-Internal	11.160	8.216	.000
Leanings	Conservative- Liberal	0.660	0.600	.551

Table 4: Mean, standard deviation and the score of comparison of thinking styles of boys and girls

Dimension	Thinking Styles	Mean		Standard Deviation		t	Sig(2-tailed)
		Boys	Girls	Boys	Girls		
Function	Legislative	3.50	2.68	1.461	1.804	1.594	0.118
	Executive	4.56	4.47	1.504	1.461	0.206	0.838
	Judicial	1.94	2.88	0.929	1.431	2.407	0.020
Form	Hierarchic	3.94	3.88	1.692	1.409	0.121	0.904
	Monarchic	3.81	3.71	1.276	1.679	0.225	0.823
	Oligarchic	1.19	1.29	1.047	1.001	0.346	0.731
	Anarchic	1.06	1.12	0.854	1.149	0.171	0.865
Levels	Local	12.75	18.03	5.235	4.317	3.511	0.002
	Global	19.00	13.91	5.317	4.302	3.615	0.001
Scope	External	23.81	26.41	5.659	4.179	1.827	0.074
	Internal	16.19	13.59	5.659	4.179	1.827	0.074
Leanings	Liberal	18.69	20.09	13.156	4.231	1.177	0.245
	Conservative	21.31	19.82	3.156	4.086	1.286	0.205

Interpretation of Results

Table 2 shows the mean and standard deviation scores of the thinking styles from which the preferred thinking style in students of class IX is found out using the data, mean \pm standard deviation from each of the five dimensions.

Under the dimension of *function*, results show that the preferred style is the executive thinking style (4.50 \pm 1.460) and the least preferred is judicial style (2.58 \pm 1.357). The most preferred thinking style in the dimension, form is the hierarchic style (3.90 \pm 1.488), and the least is anarchic (1.10 \pm 1.055). The order of preference is hierarchic, monarchic, oligarchic and anarchic. Local thinking style (16.34 \pm 5.208) was found to be the predominant style over global thinking style (15.54 \pm 5.183) in the dimension, *level*. The fourth dimension, the *scope* has external thinking style (25.58 \pm 4.803) as the most preferred than internal thinking style (14.42 \pm 4.803). The preference for the thinking style under the dimension *leanings* was found to be for conservative thinking style (20.30 \pm 3.845) over liberal thinking style (19.64 \pm 3.942).

Table 3 shows the result of the paired comparison of means of the component thinking styles under the five dimensions.

Even though there was a preference given for the thinking styles under each of the dimensions, the results of the paired t-test for some of the pairs of styles showed no significant differences. The paired sample t test results for, legislative-judicial (t=.927,p>.05), hierarchic-monarchic (t=.422,p>.05), oligarchic-anarchic (t=.760,p>.05), global-local(t=.545,p>.05), and conservative-liberal (t=.0600,p>.05) showed no statistically significant difference since the level of significance was found to be greater than 0.05. But a statistically significant difference were found between the pairs executive-legislative(t=3.793,p<.05), executive-judicial (t=6.139,p<.05),

hierarchic-oligarchic ($t=9.160, p<.05$), hierarchic-anarchic ($t=9.610, p<.05$), monarchic-oligarchic ($t=8.343, p<.05$), monarchic-anarchic ($t=8.588, p<.05$), and internal-external ($t=11.160, p<.05$) since the level of significance was found to be less than 0.05.

Table 4 shows the mean, standard deviation and the result of comparison of thinking styles boys and girls of students of class IX.

Test of significance of the difference between means (t-test) is used to compare boys and girls with respect to their thinking styles. Boys preferred legislative (3.50 ± 1.461), and executive thinking style (4.56 ± 1.504) more than that of girls but the difference was not statistically significant (t for legislative= 1.594 & t for executive= 0.206 , $p>.05$). Judicial thinking style was preferred by girls (2.88 ± 1.431) and less preferred by boys (1.94 ± 0.929) and was statistically significant ($t=2.407$, $p<.05$). Boys preferred hierarchic and monarchic thinking styles while girls preferred oligarchic and anarchic styles more than that of boys. There existed no significant gender difference in the preference for hierarchic ($t=0.121$, $p>.05$), monarchic ($t=0.225$, $p>.05$), oligarchic ($t=0.346$, $p>.05$), and anarchic forms of thinking ($t=0.171$, $p>.05$). Girls preferred the local level of thinking (18.03 ± 4.317) while boys preferred the global level of thinking (19.00 ± 5.317) and were found to be statistically significant since $p<0.05$. The gender difference was not significant in external and internal thinking styles ($p>0.05$). Both boys and girls preferred external thinking style over internal thinking style. Girls preferred liberal thinking styles (20.09 ± 4.231) while boys preferred conservative thinking styles (21.21 ± 3.156) but the difference is not statistically significant ($t=1.286$).

DISCUSSION

Several studies had been reported on thinking styles. Secondary school students from high socio-economic status families obtained a significantly higher score on legislative thinking style than students from lower socio-economic status families (Sternberg & Grigorinko, 1995). As per the study conducted by Zhang and Sachs (1997), male students scored significantly higher on the global thinking styles. The study conducted by Cilliers and Sternberg (2001), reported that there was a significant difference with regard to gender. Female students showed a preference for executive style than male students. Verma (2001) in the study reported that female college students had more inclination towards the use of legislative and executive thinking style whereas male students had a higher tendency to adopt monarchic thinking styles. A study conducted on thinking styles, self-esteem and socioeconomic status by Zhang and Postiglione (2001) found that regardless of age those students who reported higher order thinking styles and higher esteem tend to be students from higher socioeconomic status families. According to Verma (2001), rural-urban differences in thinking styles are negligible. Zhang (2002) investigated the nature of thinking styles and its relation to cognitive

development among university students in Hong Kong. Students who reasoned at a higher cognitive, developmental level used a wide range of thinking styles than students who reasoned at a lower cognitive developmental level. Are achievement motivation and thinking styles related? Indian senior secondary students had a significantly stronger preference for legislative and conservative thinking style and a lower preference for global and external thinking (Verma 2004). The study conducted by Verma and Monika, (2006) reported that gender had a significant influence on executive, anarchic, and external thinking styles. Gafoor and Lavanya (2008) explored the thinking styles of senior secondary school students and in its relation to achievement in Physics. The study revealed that the students preferred legislative, hierarchic, local level and external thinking more. The external type of thinking favours achievement more. A visit among Chinese University students, a study conducted by Fan and Zhang (2009) revealed that the more creativity generated and complex thinking styles correlated more positively with achievement motivation. Ayhan Dikicia (2014) examined the role of demographic traits of Turkish teachers on the relationship between thinking styles and creativity fostering behaviours. The results revealed that both the teachers' branch and the amount of work experience were significant mediators of the relationships between thinking styles and creativity fostering behaviours.

The review revealed that achievement or academic success which is pivotal for the educational development of a child was influenced by a style one chooses. Especially, cognitive abilities play essential roles. Even to understand, appreciate or apply, we have to employ our powers of thinking. Individuals approach the problems before them in different ways. They adopt different styles of thinking. The review, as well as the present study, revealed that individuals prefer different styles of thinking and gender differences was also evident from the results. Existing studies indicated the contribution of different thinking styles on academic achievement. Each individual has a set of unique characteristics. This diversity leads to differences in their quality of performance. Without considering the individual difference, it is not possible to provide them with healthy learning experiences. The analysis of thinking styles on a much wider sample rather than just sticking to secondary school students and the inclusion of other demographic variables apart from gender can help in the deeper understanding of the concept of thinking styles.

CONCLUSION

The present study shows that under the dimension of function, students prefer the executive style where the students prefer to follow the rules. Under the dimension forms, students prefer the hierarchic style where the individuals like to do several tasks as per the priority they assign. The local level of thinking is preferred where students like to work on a particular task before moving to another task. Results show that students prefer to work with others and do things according to

established procedures which indicates that external and conservative styles are more predominant under the dimensions of scope and leanings respectively. As the study reveals, the styles of thinking are also influenced by the demographic factor gender.

The study can help teachers in finding out the style that has positive and negative effects on the individual. Students who follow a structured approach and who likes to work with others can be benefitted more from the constructivist approach that a teacher follows and accordingly they can be given adequate activities. Pupils who follow an unstructured approach can be given more attention and guidance to help them to improve their styles.

Researchers' in the educational field have been proposing that a large number of factors are associated with the students' performance. The more the world becomes modern, the more complicated it becomes for the educators to bring out the best education model. In the changing scenario, with the outburst of technology, the way of thinking or perceiving a problem has changed. It becomes essential to develop and foster one's thinking styles to provide them with a healthy, positive environment. It's the duty of the teachers and school authorities to provide the students with constructive student-centred learning experiences taking into consideration the individual differences. The analysis of thinking style can provide us an indication about the strategies and activities that is best suited for each individual. To achieve and maintain mastery of the subjects, it is essential to deliver the instruction in such a way that it matches best to each learner's way of acquiring information.

The study thus is of immense educational importance to students, teachers, administrators, counsellors etc. An understanding of the existence of different thinking styles can assist teachers in using several techniques and methods to facilitate effective learning. Awareness of their style can help the student to identify one's own preferred styles, learn how to capitalize on their strengths, compensate for their weaknesses learn how to adapt, to decide accurately, to be motivated and to achieve success. It will help the teachers to foster the thinking styles which will help the individuals and also can provide them with a healthy positive environment and learning activities. Considering the changing educational scenario, the perception of individuals, and the individual differences, the knowledge of thinking styles that each student prefer can be of utmost importance to the educational scenario which includes the student, teachers, and administrators.

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