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The Common Thinking Styles Based on the Mental Self-Government Theory Among Saudi University Students According to Gender, Academic Achievement and Extracurricular Activities

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Abstract. This study aimed to investigate the common thinking styles based on Sternberg's mental self-government theory among students of the Imam Abdulrahman Bin Faisal University, Saudi Arabia, according to gender, academic achievement, and extracurricular activities. The descriptive approach was suitable for achieving the study's objectives. The study sample consisted of 515 students (257 males, 258 females). The researchers developed an Arabic version of the Thinking Styles Inventory. The results showed that the most common thinking style among students is legislative, followed by the hierarchic, judicial, and external styles to high degrees, while the oligarchic, internal, conservative, and anarchic styles were less common at moderate degrees. The legislative style was more prevalent among female students than male students. Students with acceptable academic achievements most used legislative and executive thinking styles, while students with excellent achievements most used the judicial style. The results indicate that students with strong participation in extracurricular activities most commonly use legislative and judicial thinking styles. The study recommends paying more attention to the thinking styles of a new generation of individuals (males and females), who have creative potential, and increasing consideration of extracurricular activities due to their importance in shaping the students' personalities and meeting their interests and needs.

Keywords: thinking styles; mental self-government theory; academic achievement, extracurricular activities

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1. Introduction

The topic of learning has long preoccupied both educators and practitioners. It continues to dominate the thinking of many educators, teachers and families, and many questions continue to arise regarding the best ways to achieve optimal learning and education. Due to this great interest, a rich body of knowledge has been cultivated in this area. In recent years, increased interest has developed in factors affecting student learning, such as preferred learning styles, which are expected to differ from one individual to another. Due to individual differences, children learn and interact differently with the material being taught. Some children learn through lectures, while others learn better in projects, and others prefer organised tasks. In summary, the responses of children to learning vary greatly (Sternberg & Zhang, 2005). These questions lead us to discuss the concept of thinking styles or learning styles and their relationships to the learning process. The various thinking styles differ from one another but have one thing in common: they relate not to an individual's level of ability but rather to their preferred methods of processing information using their capabilities (Ramzan et al., 2014). Therefore, we should differentiate between the terms, 'thinking style' and 'learning style'; the two terms may not be used interchangeably. Specifically, learning styles are considered as preferred pathways for learning materials, being oral, through audio, audio-visually or kinaesthetically. Alternatively, thinking styles may be defined as preferred ways of thinking about the material (Sternberg & Zhang, 2005).

Common thinking styles among different groups and samples of individuals have been subject to many studies worldwide. Most of these studies adopted a list of thinking styles derived from the work of Sternberg (1988), who published his theory of 'Mental Self-Government' to clarify the working mechanisms of the human mind. The theory suggested 13 thinking styles classified into functions, forms, levels, and scopes (Apaydin & Cenberci, 2018; Ramazan et al., 2014). Despite the fact that the concept of thinking styles is becoming popular and well-known in education, students and teachers have no clear idea of how this framework might be used in support of their efforts to enhance learning and development (Zhang & Wong, 2011).

2. Importance of the Study

Many researches have applied the theory of mental self-government (TMSG) on multicultural environments by exploring the way thinking styles relate to various student and teacher characteristics, whether these styles are affected by the personal status of age or gender or whether the styles affect extracurricular activities and the perceived learning or teaching environment (Zhang & Sternberg, 2005).

The second path of research examines the way thinking styles affect different aspects of student learning and development, including academic achievement, self-esteem, cognitive development, personality, and psychosocial development (Zhang & Sternberg, 2005).

The third path of research determines the nature of the relationships between thinking styles and stylistic structures suggested by other researchers (Zhang & Sternberg, 2005).

The current study is the first to be conducted at IAU, relying on thinking styles based on Sternberg's theory (1988). It is also one of few studies – whether local, regional, or international – to deal with unconventional variables, such as extracurricular activities, when studying common thinking styles among university students according to the mental self-government theory.

3. Study Problem

It is crucial to reveal the thinking styles that are common in society and its educational institutions, whether in schools, universities or even in the workplace, as this will yield a clearer picture of the preferred approaches that individuals use when thinking through and dealing with the problems of daily life. Moreover, it is necessary to determine the type of thinking styles preferred by male and female university students. While the most important of these is reinforcing strong patterns and developing weak ones, other notable examples include working on harmonising ways of thinking, the teaching methods and activities used in managing the educational process and even the nature and quality of the extracurricular activities provided to students.

Even though IAU is one of the most important public universities in Saudi Arabia, no study has been conducted on common thinking styles according to (TMSG) at the university level, except a study on female students at the College of Arts. Accordingly, there is a need to conduct such a study at the university level, as this will provide decision-makers with an expanded understanding of the thinking styles common among university students. Based on the above, the current study problem can be defined as follows: to investigate common thinking styles based on Sternberg's (TMSG) among students at IAU, according to gender, academic achievement, and extracurricular activities.

4. Study Questions

The main question of the study is: *What are the common thinking styles among students of IAU based on Sternberg's mental self-government theory?*

This main question is divided into the following sub-questions:

1. According to mental self-government theory, what are the common thinking styles among students of IAU?
2. What are the common thinking styles among students of IAU according to gender?
3. What are the common thinking styles among students of IAU by the level of academic achievement (excellent, very good, good, acceptable)?
4. What are the common thinking styles among IAU students by the degree of participation in extracurricular activities (strong, often, sometimes, does not participate)?
5. What are the common thinking styles among students of IAU depending on the type of extracurricular activities they participate in?

5. Literature Review and Related Studies

The study of Ginting (2017) found the following distribution of learning styles among university students: the majority, 45.72% on average, belong to the visual learning category; 28.17% to the auditory learning category; 19.24% to the reading category; and 11.39% to the kinaesthetic category. Moreover, thinking style questionnaire sheets indicated that the majority of university students (52.85%) adopt a concrete sequential style, while 23.45% adopt an abstract sequential style, 12.78% adopt a random abstract style and 10.92% adopt a random concrete style.

Mental Self-Government Theory

Overviewing his theory, Sternberg (1997) argues that people are similar to governments in that they need to perform three essential functions: legislative (proposing new ways of doing things), executive (following rules and implementing the plans of others) and judicial (evaluating regulations and procedures). People adapt themselves according to the requirements of tasks which are often changing. These stylistic preferences may be subject to the functions associated with an individual's interactions within the social and cultural environment (Bernardo et al., 2020). Individual difference plays a major role in the way people think. Styles of thinking are the factor influencing how an individual performs a task. It can be mentioned as a favourable method that characterizes the way an individual think (Saini & Shabnam, 2019).

The (TMSG) deals with the thinking styles people adopt in various settings, including at university, at home and in society. People tend to be flexible to a certain extent in their use of styles, as whenever possible, they try to adapt their style to the requirements of a specific situation. (Zhang, 2001a). In summary, thinking styles can vary with different tasks and situations, and people often vary their styles to an extent to cope with what is being performed.

People also differ in terms of the strengths of their stylistic preferences and flexibility. Thinking styles are shaped by the continuous interactions between the individuals and their environment. They can also change through age; They are unstable, as people may change their styles over the years, and the styles that individuals may use at one time that can lead to success in a situation or a job may also lead to failure in another (Sternberg, 1997).

The different types of government in the real world are not accidental but inevitable reflections of how people organize or manage their daily lives. This theory assumes that people can be understood in terms of functions, forms, levels, scopes and government leanings. The styles theory applies to education as well as other areas of life, personally and professionally ((Saini & Shabnam, 2019, Sternberg & Zhang, 2005).

In 1988, Sternberg published the (TMSG) which describes the mechanism of the human mind. The theory is consisting of 13 thinking styles that fall under various dimensions (Apaydin & Cenberci, 2018). In more detail, there are three 'function' styles, four 'form' styles, two 'level' styles, two 'scope' styles, and two 'leaning' styles (Ramazan et al., 2014).

1. **Functions:** This category includes *legislative*, *executive*, and *judicial* thinking styles. The legislative function is for creating, formulating, or planning ideas, strategies, or products, while the executive function executes the plan developed by the legislative function. The judicial function involves activities related to judgements (Ramazan et al., 2014). Individuals focusing on creativity and planning in a legislative thinking style are inclined to situations that allow them to express their ideas (Apaydin & Cenberci, 2018). As for executive students, they often prefer receiving direction on what they are supposed to do, and they do their best to perform the task well. In most cases, traditional teaching strengthens the organisational type, as the ideal student does, he asked to do and does well according to the instructions he has received (Sternberg & Zhang, 2005). Individuals with an executive thinking style tend to have a set of shared guiding principles and take part in work according to given instructions. (Apaydin & Cenberci, 2018).
2. **Forms:** Sternberg lays out four forms of style. The *monarchic* form describes a 'single-minded' individual, who typically focuses on one goal or need at a time. Persons with a *hierarchic* style are more diverse but can order their goals clearly in terms of priority. *Oligarchies* are motivated by several goals simultaneously but do not prioritise them; thus, they can only do well when an order of priority is provided for them to follow. Finally, individuals with an *anarchic* style tend to oppose any system, including one of their design (Sternberg, 1997).
3. **Levels:** The main levels of this category are *local* and *global*. A globalist usually deals with relatively larger issues; however, these issues tend to be abstract rather than concrete. In contrast, a localist considers relatively minor problems and details and believes in concrete thinking approaches, such as planning a school timetable (Ramazan et al., 2014). Those thinking in a local style enjoy dealing with work through concentrating on details; while individuals with a global thinking style prefer concentrating on ideas as a whole (Apaydin & Cenberci, 2018).
4. **Scope:** Individuals are similar to governments in terms of domestic and foreign affairs; individuals have internal and external mental self-government approaches. Individuals with an interior style prefer tasks that require working independently of other people. Those with an exterior style prefer tasks that require interaction and cooperation with others (Bernardo et al., 2020). Accordingly, an internal scope concerns itself mainly with tasks that involve practicing intelligence in a way separate from others, such as solving analytical problems, composing music, doing arts and crafts, or working with machines (Sternberg, 1988).
5. **Leanings:** An individual with a conventional thinking style tends to work by following instructions, while an individual with a liberal thinking style is open to creative ideas and does not avoid risk or the unknown (Apaydin & Cenberci, 2018). One study found a significant relationship between positive attitudes towards research and liberal thinking styles in research (Ince et al., 2018).

Academic Achievement and Thinking Styles

Academic achievement can be improved if students are informed about thinking styles, as it assists instructors in preparing appropriate learning environments (Coşkun, 2018). Teachers are required to adapt their teaching styles to students' different personalities, needs and learning styles. As teaching styles play a prominent role in shaping the teaching and learning process, such styles play the most crucial role in enhancing student success. Accordingly, teachers need to use different teaching styles, considering individual student differences to provide a high-quality education (Apaydin & Cenberci, 2018). An important study on thinking styles revealed a very clear relationship between the thinking styles of teachers and those of their students (Sternberg & Zhang, 2005).

A medium positive relationship was found between the thinking and teaching styles of a group of university students who will become mathematics teachers after their graduation (Apaydin & Cenberci, 2018). Another study emphasized the importance of teachers' thinking styles, Ozan (2019) found that potential teachers prefer Legislative, royal, executive, judicial and liberal styles of thinking. Their attitudes towards the teaching profession were positive. He revealed a positive relationship between liberal, external, royal, executive, hierarchical, legislative, and judicial. On the other hand, a negative relationship was found between the oligarchic thinking style and the attitude towards the teaching profession. Zhang (2005) found that the students' thinking styles greatly affected the formulation of their concepts about effective teachers. Sternberg and Zhang (2005) measured the thinking styles of teachers and their students and found that teachers perform better and are rated higher by students when their thinking styles are similar to the students' thinking styles.

Two studies have revealed that academic achievement is attributed to thinking styles. The first conducted by Ramzan et al. (2014) investigated the quality of the thinking styles mentioned in Sternberg's (TMSG). The results indicated that the students' executive, judicial, local, and conservative thinking styles had a positive impact on the students' cumulative grade point average (GPA), while the impact was negative on global and liberal thinking styles. The results also showed that the analytical method of thinking has a positive indication of the students' GPA, while the comprehensive thinking method contributes less to the students' achievements.

The second research study by Bernardo et al. (2002) found that thinking styles affect academic achievement. The researchers studied the correlation between students' scores with their cumulative averages. The results found a relationship between the used thinking style and overall academic achievement, but there was no relationship between legislative style and academic achievement.

Extracurricular Activities and Thinking Styles

Extracurricular activities refer to students' non-academic activities and fall outside the institution's curriculum (Khanna et al., 2020). Interest in extracurricular activities was found to significantly influence social, academic, linguistic, moral, and overall self-efficacy (Bekomson et al., 2020).

The findings of Khanna et al.'s (2020) study could be used to support policy decisions for the improvement of college education through promoting extracurricular activities, as they found that minimising extracurricular activities negatively impacts college students. Extracurricular activities are needed to improve the academic environment and students' performance. Zhang (2001b) found thinking styles to be statistically related to participants' extracurricular experiences, the results indicated that a significant relationship exists between students' thinking styles and their self-esteem.

6. Methodology

The descriptive approach was employed in this research due to its suitability for achieving the objectives of the current study, which aimed to investigate the common thinking styles among university students in Saudi Arabia.

Participants

The study sample consisted of 515 (257 males, 258 females) students at IAU. The participating students were enrolled in the university for the academic year 2020/2021. In terms of their academic achievements, 289 students were excellent, 133 were very good, 84 were good and nine were acceptable. Within the study sample, 43 students intensely participated in extracurricular activities, 94 often participated and 246 sometimes participated, while 132 did not participate in extracurricular activities. Finally, in terms of the type of activities the students participated in, the study sample was distributed across eight categories: students who participated in extracurricular social activities (118), cultural activities (99), sporting activities (93), scientific activities (80), artistic activities (51), health-related activities (44), religious activities (18) and scouting-related activities (12).

Instrument

The researchers developed an Arabic version of the Thinking Styles Inventory based on Sternberg's (TMSG) after reviewing some existing Arabic versions, such as that of Abu Hashem (2015), as well as the English version by Sternberg and Wagner (1992).

Researchers verified the appropriate validity and reliability indicators for the use of the instrument. Exploratory factor analysis (EFA) was used to explore the distribution of the indicators on their related factors and test reliability and validity. Analysis was conducted on the five dimensions of Sternberg's mental-self-government model (i.e., functions, levels, learning, forms, and scope). Overall, the EFA results indicate that the scale used to predict the five dimensions of Sternberg's (TMSG). In summary, the study tool (the Arabic version) consisted of a questionnaire that adopts the self-report method and consists of 65 items, where respondents rate themselves on a five-point scale ranging from 'Strongly agree' to 'Strongly reject'.

7. Results and Discussion

The following section presents the data analysis procedures, results and discussion for the research questions using data gathered from a sample consisting of students from IAU in Saudi Arabia. The initial number of questionnaire responses was 613. Of this total, 98 were identified as outliers and

removed; therefore, 515 questionnaires remained within a normal data distribution.

RQ1: What are the common thinking styles among IAU students conforming to the mental self-government model?

The researchers used mean (M) and standard deviation (SD) to answer RQ1. The degree to which the thinking styles were present was based on three levels: high (1.00 to < 3.34), moderate (3.34 to < 3.67) and low (3.67 to 5.00). The results in Table 1 show that nine thinking styles were present to high degrees and four to moderate degrees. The most common thinking style among students is the legislative style (M = 4.09, SD = 0.61), followed by the hierarchic, judicial, external, executive, liberal, local, monarchic, and global styles to high degrees (M > 3.67); moreover, the oligarchic, internal, conservative and anarchic styles were the less common styles and were present to moderate degrees (M < 3.67).

Table 1: M and SD of thinking styles (N = 515)

Styles	N	M	SD	Rank	Degree
Legislative	515	4.09	0.61	1	High
Hierarchic	515	3.97	0.65	2	High
Judicial	515	3.91	0.61	3	High
External	515	3.90	0.70	4	High
Executive	515	3.85	0.73	5	High
Liberal	515	3.84	0.68	6	High
Local	515	3.84	0.66	7	High
Monarchic	515	3.79	0.72	8	High
Global	515	3.70	0.69	9	High
Oligarchic	515	3.66	0.76	10	Moderate
Internal	515	3.65	0.78	11	Moderate
Conservative	515	3.61	0.76	12	Moderate
Anarchic	515	3.54	0.82	13	Moderate

The current study results were not in total agreement with the findings of Abu Hashem (2015), who found that the common thinking styles of the Egyptian and Saudi samples were hierarchic, oligarchic, monarchic and legislative. Similar results were found by Sağlam and Tunç (2018), who concluded in their study of a faculty of education that the most used thinking style of its students was legislative and the least was conservative.

In addition to the above, with regard to the male students, it was found that the judicial thinking styles was the most prevalent in the functional thinking style, the hierarchy was most common in forms dimension, while external was most common in the scope dimension, and the local and global frequency were equal.

in the levels. It was observed that conservative style is the most common in the leaning thinking styles (Aljojo, 2017).

RQ2: What are the common thinking styles among IAU students according to gender?

The results show that the legislative style is more prevalent among female students ($M = 4.20$, $SD = 0.58$) than among male students ($M = 3.99$, $SD = 0.61$); in fact, there were significant differences between male and female students ($t = 3.99$, $Sig. = 0.000$). By contrast, the executive style is slightly more prevalent among male students compared to female students. While there is some indication that the judicial style is slightly more widespread among female students than male students, there are no differences statistically between the two groups in terms of the judicial style.

For global and local styles, there are no statistical differences between male and female students. The case is the same with local styles. As for liberal and conservative styles, the result revealed that the liberal style is more common among female students than male students and that the difference between the two groups is clear ($t = 2.42$, $Sig. = 0.016$). By contrast, there is a slight difference between male students ($M = 3.66$, $SD = 0.68$) and female students ($M = 3.57$, $SD = 0.82$) in terms of the conservative style (more prevalent among males), but this difference is not statistically significant.

Regarding the hierarchic, monarchic, oligarchic, and anarchic styles, the results showed that the hierarchic style is more common among female students than male students, the differences were significant between the two groups ($t = 3.87$, $Sig. = 0.000$). Moreover, the monarchic style is more common among male students than female students; nonetheless, there were no significant differences between the two groups ($t = 0.417$, $Sig. = 0.677$). The oligarchic style is more prevalent among females when compared to males but only slightly, as evidenced by the absence of statistically significant differences between the two groups ($t = 0.099$, $Sig. = 0.679$). Finally, no significant differences were found between female and male students in terms of the anarchic style ($t = 1.56$, $Sig. = 0.118$).

Table 2: Thinking styles among students based on their gender.

Thinking styles	Gender	Rank	N	M	SD	t	Sig.
Legislative	Male	2	257	3.99	0.61	3.99	0.000
	Female	1	258	4.20	0.58		
Executive	Male	1	257	3.87	0.65	0.438	0.662
	Female	2	258	3.84	0.80		
Judicial	Male	2	257	3.89	0.63	0.840	0.401
	Female	1	258	3.93	0.57		
Global	Male	2	257	3.66	0.64	1.27	0.203
	Female	1	258	3.74	0.73		
Local	Male	2	257	3.79	0.65	1.60	0.110
	Female	1	258	3.88	0.66		
Liberal	Male	2	257	3.76	0.71	2.42	0.016
	Female	1	258	3.92	0.69		

Conservative	Male	1	257	3.66	0.68	1.32	0.188
	Female	2	258	3.57	0.82		
Hierarchic	Male	2	257	3.87	0.63	3.87	0.000
	Female	1	258	4.08	0.64		
Monarchic	Male	1	257	3.81	0.66	0.417	0.677
	Female	2	258	3.78	0.76		
Oligarchic	Male	2	257	3.65	0.73	0.099	0.679
	Female	1	258	3.68	0.78		
Anarchic	Male	2	257	3.49	0.76	1.56	0.118
	Female	1	258	3.60	0.86		
Internal	Male	2	257	3.53	0.76	3.62	0.000
	Female	1	258	3.78	0.77		
External	Male	1	257	3.91	0.59	0.132	0.895
	Female	2	258	3.89	0.79		

In terms of internal and external styles, the results presented in Table 2 indicate that the internal style is widespread among female students ($M = 3.78, SD = 0.77$), as they practise this style to a high degree compared to male students, who practise it only to a moderate extent ($M = 3.53, SD = 0.76$). Of course, there were statistically significant differences between females and males regarding this style ($t = 3.62, Sig. = 0.000$). For the external style, it was observed that the differences between male students and female students are very small and not significant ($t = 0.132, Sig. = 0.895$).

The question of common thinking styles among IAU students according to gender shows that the legislative style is more prevalent among female students than male students. This result agreed with the findings of Sağlam and Tunç (2018), who found that there is more than one type of thinking styles that differ according to the gender variable, including the legislative, executive, and hierarchical styles of thinking. However, other findings revealed that gender was not a significant variable for learning styles (Dilekli, 2017).

By contrast, while the judicial, global, and local styles are slightly more common among female students than male students, these differences are not statistically significant. A study by Coşkun (2018) concluded that the rational thinking (judicial) styles of female and male students are similar. No significant difference was identified between genders in terms of cognitive thinking styles, while a significant difference was found in favour of female students related to experiential thinking style.

Regarding the hierarchic, monarchic, oligarchic, and anarchic styles, the results showed that a hierarchic style is more common among female students than male students and that a significant difference exists between the two genders. This result is supported by Martínez-Romera (2018), whose findings showed that women were less likely to show interest in activities that could initially seem chaotic or unstructured (anarchic form).

The current study results differ significantly from the results of Aljojo's (2017), which found that the common thinking styles of female students were executive, hierarchical, followed by external, local, and liberal, while the common thinking styles of male students were judicial and hierarchical, followed by external, local and conservative. However, both male and female students showed three common thinking styles (hierarchical, extrinsic, and local).

RQ3: What are the common thinking styles among IAU students based on their level of academic achievement?

The results of the functions of Sternberg's model (legislative, executive, and judicial) among students based on their level of academic achievement show that the legislative style common ($M = 4.09$, $SD = 0.61$) and that no significant differences between students were detected in terms of their academic achievements ($F = 0.815$, $Sig. = 0.486$). Similarly, the executive and judicial styles were common, with no significant differences. Students with acceptable academic achievements ranked first in the use of legislative and executive styles, while students with excellent achievements ranked first in the use of the judicial style. The results indicate that students with good academic achievements used the global style more frequently ($M = 3.77$, $SD = 0.66$) than the local style ($M = 3.91$, $SD = 0.58$). Students with excellent, very good and acceptable academic achievements used the local style more frequently than the global style. Despite this, significant differences not found between students in terms of scores on the global ($F = 0.408$, $Sig. = 0.748$) and local styles ($M = 0.850$, $Sig. = 0.467$) based on their academic achievements. The learning style results emphasised that the liberal style is broadly more common among students when academic achievement is considered. For example, students who have excellent achievements often use the liberal style ($M = 3.91$, $SD = 0.65$) and moderately use the conservative style ($M = 3.56$, $SD = 0.74$). Students who have very good achievements often use the liberal style ($M = 3.73$, $SD = 0.76$) and moderately use the conservative style ($M = 3.66$, $SD = 0.74$). Moreover, students with acceptable achievements most commonly used the liberal style ($M = 4.02$, $SD = 0.36$) and used the conservative style least often ($M = 3.53$, $SD = 0.72$). In terms of significance, however, the results indicate no significant differences between students in either the liberal style ($F = 2.47$, $Sig. = 0.061$) or the conservative style ($F = 0.915$, $Sig. = 0.434$). The results also indicate that students incline more towards the hierarchic and monarchic styles. All students use these styles to high degrees, except those with acceptable levels of academic achievement. Finally, no statistically significant differences were found among the students according to form styles. Results for scope styles among students show that the individuals tend to practise the external style. Excellent and acceptable students use both the internal and external styles to high degrees, while good students mostly used the external style and moderately used the internal style. Indeed, statistically significant differences were found among the students on the basis of their academic achievement who used the internal style; however, no such differences were detected among students for the external style.

Students with acceptable academic achievements most commonly used the legislative and executive styles, while students with excellent achievements most commonly used the judicial style; this can be explained by a relationship between

high achievement and the judicial style. The findings of Bernardo et al.'s (2002) study uncovered a relationship between judicial style and general academic achievement.

Significant differences were found between students in terms of internal style based on their academic achievement, but no such differences were detected among students regarding the external style. Notably, Zhang's (2001a) study emphasised thinking styles' predictive ability for academic achievement by using data from both Hong Kong and mainland China, suggesting that thinking styles predict academic achievement statistically. However, the present results indicate that the relationship between thinking styles and academic achievement is not clear enough to support Zhang's (2001a) findings; for example, students with acceptable academic achievements most commonly used the legislative and executive styles, while students with excellent achievements most commonly used the judicial style. The findings of two further studies support this idea. The results of a study by Ramzan et al. (2014) pointed out that (legislative, executive, judicial, local, and conservative) styles of thinking positively affected the GPA of students, while they affected the global and liberal thinking styles negatively.

RQ4: What are the common thinking styles among IAU students based on the degree of participation in extracurricular activities?

The results of the functions of Sternberg's model (legislative, executive, and judicial) reveal that students use all three styles to high degrees. It was noted that the majority of students (N = 246) sometimes participate in extracurricular activities, and these students commonly use all styles (M > 3.67). Students who did not participate ranked second (N = 132) and practised all styles to a high degree (M > 3.67). In third place were students who often participate in extracurricular activities (N = 94), who also commonly use all styles (M > 3.67). The same applies to students who have strong levels of participation (N = 43). The results reveal that students with strong participation levels most frequently use the legislative style and the judicial style; however, they least frequently used the executive style (M = 3.75, SD = 0.83). In contrast, students who did not participate least frequently used the legislative and judicial styles and were ranked third in use of the executive style (M = 3.85, SD = 0.77). Further analysis of these results revealed significant differences between students based on their participation in extracurricular activities (PEA) in the judicial style (F = 3.93, Sig. = 0.009), and on the contrary of legislative and executive styles.

The results indicate that students are more inclined to practise the local style (M = 3.84, SD) than the global style (M = 3.70, SD = 0.74). Further analysis showed no significant differences existing between students in terms of the global style (F = 0.039, Sig. = 0.99) or the local one (F = 0.758, Sig. = 0.518). Based on the results, students favour the liberal style (M = 3.84, SD = 0.69) over the conservative style with no significant differences.

Table 3: Functions of Sternberg's model among students based on the degree of (PEA)

Styles	Level	N	Mx	SD	Rank	F	Sig.
Legislative	Strong	43	4.21	0.65	1	2.019	0.110
	Often	94	4.16	0.42	2		
	Sometimes	246	4.10	0.64	3		
	Do not participate	132	4.00	0.61	4		
	Total	515	4.09	0.61	-		
Executive	Strong	43	3.75	0.83	4	0.302	0.824
	Often	94	3.87	0.59	1		
	Sometimes	246	3.86	0.73	2		
	Do not participate	132	3.85	0.77	3		
	Total	515	3.85	0.73	-		
Judicial	Strong	43	4.09	0.74	1	3.932	0.009
	Often	94	4.02	0.49	2		
	Sometimes	246	3.90	0.59	3		
	Do not participate	132	3.80	0.61	4		
	Total	515	3.91	0.60	-		

Although subjects in the present research tend to exhibit hierarchic and monarchic thinking styles ($M > 3.67$) more often than oligarchic and anarchic styles ($M < 3.67$), no clear differences could be detected between them based on their degrees of participation, as all students practise the hierarchic style to high degrees. However, such degrees tend to decline when talking about the monarchic style. A significant decrease is noted in scores for students who report strong (PEA). Their high degrees ($M = 4.04$, $SD = 0.71$) of using the hierarchic style decreased to moderate degrees ($M = 3.60$, $SD = 0.86$) of using the monarchic style. The overall degrees continue to decline further when moving to the oligarchic style and the anarchic style. The researchers only found significant differences between students based on their degree of (PEA) in the monarchic style ($F = 2.82$, $Sig. = 0.038$). The results show that students with various levels of (PEA) are more inclined to the external style ($M = 3.90$, $SD = 0.70$) than the internal style ($M = 3.65$, $SD = 0.77$). There are significant differences between students with different degrees of (PEA). Students who have strong levels of (PEA) use the external style to a higher degree ($M = 3.89$, $SD = 0.93$) than the internal style ($M = 3.68$, $SD = 0.74$). Students who participate often in extracurricular activities score highly on both the internal style and external style. Those who participate occasionally or who do not participate at all score higher on the external style than the internal style. Based on these mixed results, there were significant differences between students in the use of the internal style ($F = 2.73$, $Sig. = 0.043$) and the external style ($F = 3.30$, $Sig. = 0.020$).

It is noted that a significant decrease in the score occurs for students who report strong levels of (PEA). This is a logical result from the researchers' point of view, as solid participation in activities helps develop students' skills. Specifically,

Extracurricular activities at the university contribute to the refinement of the student's personality by improving self-esteem, communication skills, teamwork, and overall academic performance. Most students did not believe that extracurricular activities negatively affected their grades or conflicted with their studies. Extracurricular activities have significantly influenced students' academic performance (Khanna et al., 2020).

It was found that there are statistically significant differences among students depending on the degree of their participation in extracurricular activities only in the monarchic style. No significant differences between students based on their degree of (PEA) were found for the hierarchic, oligarchic, and anarchic styles. The results reveal that students who have a strong involvement in extracurricular activities use the external style to a higher degree than the interior style.

PEA encourages students to become aware to explore their learning in the external world and select activities that create a positive atmosphere around them (Khanna et al., 2020).

The importance of engaging in extracurricular activities can also be realised through examining the results of further studies. For example, (Marchetti et al., 2016) found that students from low Socio-Economic Status families who met the reading and mathematics benchmarks were statistically more likely to participate in extracurricular activities. Another study assessed the impact of extracurricular activities among dental students. A 16-item questionnaire was prepared based on the involvement of dental students in extracurricular activities. The majority of participants (88.4%) expressed their belief that extracurricular activities should be an essential and mandatory part of the university student's graduation requirements. (Khanna et al., 2020).

RQ5: What are the common thinking styles among IAU students depending on the type of extracurricular activities they participate in?

The distribution of students in the current sample is based on Sternberg's function and the types of activities they participate in are presented in Table 4. It is observed that students participating in cultural activities have the highest degree ($M = 4.25$, $SD = 0.52$), followed by those participating in social ($M = 4.18$, $SD = 0.48$), health-related and artistic activities. In addition, for students participating in scientific, religious, scouting and sporting activities, all the M scores in the legislative style based on their participation type are high. Similar results were found for the executive and judicial styles, except for those who participate in artistic activities and use the executive style ($M = 3.61$, $SD = 0.70$). Generally, students participating in different activities tend to practise legislative, judicial, and executive styles. Despite students' convergent degrees of using the legislative style, significant differences were found among them ($F = 2.23$, $Sig. = 0.030$). In addition, significant differences were found among students in terms of their use of the executive ($F = 1.32$, $Sig. = 0.24$) and judicial styles ($F = 0.96$, $Sig. = 0.467$) based on their preferred area of participation.

The results of Sternberg's level styles among students based on their preferred extracurricular activities revealed that students participating in different activities

tend to prefer the local style ($M = 3.84$, $SD = 0.66$) over the global style ($M = 3.70$, $SD = 0.69$). Students who participate in religious activities have high degrees of both the global and the local styles. Students who report participation in artistic activities use the global and local styles to lower degrees. The results show that no significant differences were found among students using the global style ($F = 0.731$, $Sig. = 0.646$) and the judicial style ($F = 1.46$, $Sig. = 0.179$) based on their activity type. As the results show, students lean more liberal than conservative, although there are some exceptions. For example, students who participate in religious activities tend to be more conservative than liberal; by contrast, students who participate in scouting activities most commonly use the liberal style ($M = 4.11$, $SD = 0.55$). Significant differences were found between students based on their activity types in the conservative style ($F = 2.33$, $Sig. = 0.024$). Students who participate in health-related, scientific, cultural, artistic and scouting activities use the conservative style to lower degrees compared to students who report participation in religious, sporting and social activities.

It is noted that students who participate in social activities tend to employ the hierarchic style ($M = 4.09$, $SD = 0.56$) and the monarchic style ($M = 3.83$, $SD = 0.67$). Students who report participation in scientific activities tend to use the hierarchic style ($M = 3.81$, $SD = 0.70$). Students who report health and sport participation also tend to use the hierarchic style ($M = 3.98$, 3.92 , $SD = 0.58$, 0.63), along with the monarchic style ($M = 3.72$, 3.85 ; $SD = 0.68$, 0.65) and the oligarchic style ($M = 3.74$, 3.75 ; $SD = 0.62$, 0.64), respectively. Students who report cultural participation tend to use the hierarchic style, the monarchic style and the oligarchic style. The most common style used by students who reported participation in artistic activities was the hierarchic style. In addition, students who report participation in religious activities tend to employ the hierarchic style and the monarchic style. Furthermore, all students used the anarchic style to lower degrees, except for scouting students, who ranked first ($M = 3.90$, $SD = 0.83$) and students of cultural participation, who ranked second ($M = 3.72$, $SD = 0.72$). Significant differences were found between students based on their preferred activity types in the hierarchic style ($F = 2.38$, $Sig. = 0.021$) and the anarchic style ($F = 2.13$, $Sig. = 0.039$).

Table 4: Functions of Sternberg's model among students based on the type of extracurricular activities they participate in

Styles	Level	N	M	SD	Rank	F	Sig.
Legislative	Social	118	4.18	0.48	2	2.233	0.030
	Scientific	80	4.00	0.57	5		
	Health	44	4.07	0.70	3		
	Sports	93	3.99	0.64	7		
	Cultural	99	4.25	0.52	1		
	Artistic	51	4.01	0.71	4		
	Religious	18	3.98	0.84	8		
	Scouting	12	4.00	0.65	5		
	Total	515	4.09	0.61			
Executive	Social	118	3.83	0.88	6	1.317	0.240
	Scientific	80	3.87	0.68	5		
	Health	44	3.96	0.51	2		

	Sports	93	3.89	0.63	4		
	Cultural	99	3.91	0.73	3		
	Artistic	51	3.61	0.70	8		
	Religious	18	3.75	0.79	7		
	Scouting	12	4.11	0.49	1		
	Total	515	3.85	0.73			
	Social	118	3.98	0.61	2		
	Scientific	80	3.79	0.64	8		
	Health	44	3.99	0.58	1		
	Sports	93	3.92	0.46	6		
Judicial	Cultural	99	3.86	0.67	7	0.964	0.457
	Artistic	51	3.94	0.64	5		
	Religious	18	3.98	0.59	2		
	Scouting	12	3.96	0.36	4		
	Total	515	3.91	0.60			

The results of scope styles among students indicate that students who participate in religious activities most commonly used the internal style, followed by those who report participation in cultural activities, and in scientific activities. In contrast, scouting students most commonly used the external style, followed by students who report participation in social activities. It was determined that significant differences exist between students in the external style ($F = 2.74$, Sig. = 0.008), while no such differences in the internal style were found due to students' participation in the extracurricular activities ($F = 1.176$, Sig. = 0.094).

The current study sample was divided into seven categories based on the type of extracurricular activity: social, scientific, health-related, sporting, cultural, artistic, religious and scouting-related. When the relationship between Sternberg's functions and types of participation is analysed, it is observed that students who participate in cultural extracurricular activities use the legislative style to the highest degree, followed by those reporting participations in social and health-related activities. It is further seen that students who participate in scouting activities used the executive style to the highest degree, followed by those reporting health-related and cultural involvement; moreover, students reporting participation in health-related extracurricular activities used the judicial style to the highest degree, followed by those reporting participations in social and religious activities.

In terms of the results related to Sternberg's level styles, students participating in different activities tend to practise the local rather than the global style. Students who reported participation in religious activities used both the global and local styles to a high degree. The results revealed no significant differences among students in the global and judicial styles based on their preferred activity type. While the results further indicate that students tend to lean more liberal than conservative, there are some exceptions; for example, students who participate in religious activities tend to be more conservative than liberal, ranking first for the conservative style, while students who reported scouting participation have the use the liberal style to the highest degree. Significant differences between students

were found in the conservative style based on their activity types. Students reporting involvement in health-related, scientific, cultural, artistic, and scouting activities use the traditional style to lower degrees than students participating in religious, sporting, and social activities. This question's results are in line with expectations because it is unsurprising that students engaged in religious activities have a conservative style more than students who participate in scouting activities who have a liberal style.

Students who report social participation tend to favour the hierarchic and monarchic styles. Students who report scientific participation tend to use the hierarchic style, and students who stated that they participate in health-related, and sports activities tend to use the hierarchic, monarchic, and oligarchic styles. Students who report participation in cultural activities tend to use the hierarchic, monarchic, and oligarchic styles. Students who participated in artistic activities used the hierarchic style to the largest degree. Students who participate in religious activities tend to use the hierarchic and monarchic styles.

8. Conclusion

The most common thinking style among students is legislative, followed by the hierarchic, judicial, and external styles, all to high degrees. This result leads us to conclude that we are facing a generation of young students characterised by their ability to creatively plan and solve problems, and who prefer teamwork over different projects. Female students' thinking styles can be defined as legislative, liberal, hierarchic, and internal, while the male students' thinking styles can be defined as monarchic and conservative. The findings confirm the need to pay more attention to students, who have creative potential, organise, and invest these capabilities in an appropriate manner to contribute to the development of their communities. Students with merely acceptable academic achievements adopt the legislative and executive styles most frequently, while students with excellent achievements ranked first in the judicial style. This result likely indicates that students with acceptable achievements may be more capable of creative thinking than students with excellent achievements. This conclusion prompts us to pay more attention to all students in terms of their levels of achievement. Every student has strengths that need to be invested in and weaknesses that must be strengthened.

The findings inform us that students with strong participation in activities have legislative and judicial styles to the highest degree but use the executive style the least. By contrast, students who do not participate in extracurricular activities are found to use the legislative and judicial styles to the lowest degree. This result leads us to rethink the relationship between the degree to which extracurricular activities are practised among university students and the legislative thinking style necessary for creative thinking and the relationship between practising extracurricular activities and academic achievement.

Finally, the finding of this study, for example, revealed that students who participate in scouting as an extracurricular activity use the executive thinking style to the highest degree, meaning they are concerned with having common guiding

principles (Apaydin & Cenberci, 2018), while students who participate in health-related extracurricular activities use the judicial style to the highest degree (Sternberg & Zhang, 2005). From these valuable findings, we may need to shed more light on the importance of (PEA), especially since research confirms their importance in personality development and their ability to positively affect academic achievement.

9. Recommendations

1. The findings confirm the prevalence of the legislative and hierarchic style among IAU students; this shows the need to pay more attention to this generation of creative individuals.
2. More studies should be conducted on other variables, such as academic specialisation and its relationship to thinking styles.
3. Studies should be conducted on the thinking patterns of faculty members and the relationship between the thinking styles of students and faculty members.
4. The common thinking styles of both male and female students should be considered in all dimensions of university life.
5. Extracurricular activities should be given more attention due to their importance in shaping students' personalities and meeting their interests and needs.

10. References

- Abu Hashem, E. S. (2015). Styles of thinking in the light of Sternberg's theory: Study of comparison between the two samples 'Egyptian and Saudi Arabia' of university students. *Saudi Society for Educational and Psychological Sciences*, 48, 77-102. https://fac.ksu.edu.sa/sites/default/files/slyb_ltfkyr.pdf
- Aljojo, N. (2017). Differences in styles of thinking 'in light of Sternberg's theory': A case study of different educational levels in Saudi Arabia. *Journal of Technology and Science Education*, 7(3), 333-346. <https://doi.org/10.3926/jotse.291>
- Apaydin, B., & Cenberci, S. (2018). Correlation between thinking styles and teaching styles of prospective mathematics teachers. *World Journal of Education*, 8(4). <https://doi.org/10.5430/wje.v8n4p36>
- Bekomson, A. N., Amalu, M. N., Mgbani, A. N., & Kinsley, A. B. (2020). Interest in extracurricular activities and self-efficacy of senior secondary school students in Cross River State, Nigeria. *International Education Studies*, 13(8). <https://doi.org/10.5539/ies.v13n8p79>
- Bernardo, A. B. I., Zhang, L. F., & Callueng, C. M. (2020). Thinking styles and academic achievement among Filipino students. *The Journal of Genetic Psychology*, 163(2), 149-163. <https://doi.org/10.1080/00221320209598674>
- Coşkun, Y. (2018). A comparative study on university students' rational and experiential thinking styles in terms of faculty, class level, and gender variables. *Universal Journal of Educational Research*, 6(9), 1863-1868. <https://doi.org/10.13189/ujer.2018.060902>
- Dilekli, Y. (2017). The relationships between critical thinking skills and learning styles of gifted students. *European Journal of Education Studies*, 3(4). <https://files.eric.ed.gov/fulltext/ED573216.pdf>
- Ginting, S. A. (2017). Facilitating effective teaching through learning based on learning styles and ways of thinking. *Dinamika Ilmu*, 17(2). <https://doi.org/10.21093/di.v17i2.850>

- Ince, H., Çenberci, S., & Yavuz, A. (2018). The relationship between the attitudes of mathematics teacher candidates towards scientific research and their thinking styles. *Universal Journal of Educational Research*, 6(7), 1467–1476.
- Khanna, N., Sivaswamy, V., Anand, M., & Ganapathy, D. (2020). Perception of dental students on the effect of extracurricular activities on academic performance. *Drug Invention Today*, 14(7), 1082–1086. <https://jprsolutions.info/files/final-file-5f7d7ab65a86b3.34076986.pdf>
- Marchetti, R., Wilson, R. H., & Dunham, M. (2016). Academic achievement and extracurricular school activities of at-risk high school students. *Educational Research Quarterly*, 39(4).
- Martínez-Romera, D. D. (2018). Sternberg–Wagner thinking styles: A research tool in social science didactics. *Journal of Technology and Science Education*, 8(4), 398–407. <https://doi.org/10.3926/jotse.422>
- Ozan, Ceyhun. (2019). The Relationship between Prospective Teachers' Thinking Styles and Attitudes towards Teaching Profession. *Journal of Curriculum and Teaching*, 8(3), 50-62. <https://doi.org/10.5430/jct.v8n3p50>. <http://jct.sciedupress.com>.
- Ramzan, M., Usmani, N., & Arain, A. (2014). Effect of thinking and learning styles on students' academic achievement. *Journal of Educational Research*, 17(1).
- Sağlam, N., & Tunc, E. (2018). The relationship between thinking styles and the need for cognition of students in the faculty of education. *International Education Studies*, 11(11).
- Saini, Garima & Shabnam. (2019). An Agnation of Mental Self-Government (MSG) and Career Personality Types. *International Journal of Management and Information Technology*, 4(1), 23-26. <http://www.publishingindia.com/anwesh>.
- Sternberg, R. J. (1988). Mental self-government: A theory of intellectual styles and their development. *Human Development*, 31, 197–224. <https://doi.org/10.1159/000275810>
- Sternberg, R. J. (1997). *Thinking styles*. Cambridge University Press. London-U.K. <https://doi.org/10.1017/CBO9780511584152>
- Sternberg, R. J., & Grigorenko, E. L. (1995). Style of thinking in the school. *European Journal for High Ability*, 6, 201–219. <https://doi.org/10.1080/0937445940060211>
- Sternberg, R. J., & Wagner, R. K. (1992). *Thinking style inventory* [Manuscript, Yale University, New Haven, U.S.A].
- Sternberg, R. J., & Zhang L. F. (2005). Styles of thinking as a basis of differentiated instruction. *Theory into Practice*, 44(3), 245–253.
- Zhang, L.-F. (2001a). Do thinking styles contribute to academic achievement beyond self-rated abilities? *The Journal of Psychology*, 135(6), 621–637. <https://hub.hku.hk/bitstream/10722/53501/1/69168.pdf?accept=1>
- Zhang, L.-F. (2001b). Thinking styles, self-esteem, and extracurricular experiences. *International Journal of Psychology*, 36(2), 100–107. <https://onlinelibrary.wiley.com/doi/pdf/10.1080/00207590042000128>
- Zhang, L.-F., & Sternberg, R. J. (2005). The three-fold model of intellectual styles. *Educational Psychology Review*, 17(1). <https://link.springer.com/content/pdf/10.1007/s10648-005-1635-4.pdf>
- Zhang, L.-F., & Wong, Y.-H. (2011). Hardiness and thinking styles: Implications for higher education. *Journal of Cognitive Education and Psychology*, 10(3). https://www.researchgate.net/publication/272145361_Hardiness_and_Thinking_Styles_Implications_for_Higher_Education/link/58d8d9e8a6fdcc1baeb8ff5d/download