

*DIVERGENT THINKING OF STUDENTS FROM
THE ART EDUCATION SPECIALIZATION
AT SULTAN QABOOS UNIVERSITY*

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ABSTRACT

The present study investigated the relationship between the degrees of divergent thinking (fluency, flexibility and originality) and the locus of control, sex and academic adjustment variables. The study was designed to test this relationship with particular reference to students from Art Education specialization from Sultan Qaboos University.

The sample was 75 students, 15 of whom were males and 60 were females. The Internal Locus of Control Scale, The Academic Adjustment Scale, and the improved Divergent Thinking Scale (Fluency, flexibility and originality) were applied.

The results of the study indicated the existence of significant differences in divergent thinking (fluency, flexibility and originality) between male and female students and between high and low academic adjustment groups. Female students and highly academically adjusted students performed better. However, the results for originality thinking were different. Therefore, the dimensions of divergent thinking for Art Education specialization students with internal locus of control need more research to reveal this important aspect.

Introduction:

Any measurement tool should be evaluated in relation to the phenomenon it is set to evaluate. Moreover, the explanation of the results generated by this tool should closely follow this fact; (Torrance, 1974, 1978). Torrance indicated in his review of creativity definitions that creativity is viewed as a process, or as a personality trait, viewed in a social context.

Guilford (1968) professed that creativity thinking is a product of particular abilities possessed by most creative people. These abilities determine whether the individual has the ability to express creative behaviour. Guilford considered the divergent thinking process as one of the five processes in the intellect structure model.

The divergent thinking process includes the following elements: fluency, flexibility, and originality. These capabilities are usually measured by some creative thinking tests, such as Torrance and

Guilford tests. They show the creative individual as one who must possess a continuous flow of ideas, and these ideas must be diverse and flexible as well as strange and rare. Furthermore, the creative process, with its distinct features, is greatly influenced by the environment and context in which the individual lives. It is largely influenced by styles of socialization, traditions, customs, roles, and by the controls and reinforcement processes received by the child during his socialization, development and schooling. Societies differ from each other in their structure, culture, and beliefs. It is observed that some societies encourage independence and self-reliance. They also encourage an atmosphere of development and modernization with no restrictions. On the other hand, other societies reinforce external controls and attachment with parents and teachers with entire obedience, despite the instructions and the situations; (Lefcourt, 1982; Qutami and Najib, 1993).

For Sarregtt (1982) the creative individuals are more fluent in their thinking, and more capable of producing a large number of new ideas as substitutes to old ones if they were asked to do so. They are also characterized as more flexible and willing to change their view about things. They also express uncommon, original and valuable ideas.

Sayed Khair Allah (1974, 1977) defines creativity as the ability of the individual for a production characterized by fluency of ideas, flexibility, and originality in response to a problem or a stimulation situation. This definition is widely used in the Arab education and psychological literature.

From the preceding points we can infer that the study of the degrees of fluency, flexibility, and originality can be enhanced by knowing the degree of incidence of these dimensions in the students in different levels of education. The objective here is for the educators to direct studying, learning, and the home, school and the university environmental conditions in order to help in developing creative thinking in the students.

The degree of internal control is assumed to be one of the determinants of personality which help in the understanding of the students behaviour, their academic, adaptive and creative performance.

On the other hand, the type of control forced upon the student determines his academic and vocational future. In this sense, then, the study of control in connection with other personality variables such as divergent thinking and adaptation may contribute to an understanding of the stimuli that influence the performance of the university student (Findley and Cooper, 1983, 1984).

The Arab societies endeavour towards the achievement and discovery of the abilities of its youth. Hence, the present study is important. It will provide researchers and educationists with the necessary information about how the student is influenced by personality variables such as his degree of control, academic adaptation, his sex and divergent thinking. This information should lead, in turn, to the student achieving a good degree of adaptation and achievement.

The Omani society, as an Arab society, pays much attention to students' instruction and adaptation in order to create a suitable university environment. Sultan Qaboos University provides students with feelings of security and respect. This will make them feel competent and able to achieve the objectives of Omani society. The different activities of the university, the unique modern buildings, laboratories, drawing-rooms, materials, and multi-national faculty staff are pertinent elements for a suitable environment to enhance and encourage the creative capacities in students; (Baker & Siryk, 1984).

The objective of the present study is to examine the relationship between divergent thinking (fluency, flexibility, and originality) and the sex and academic adaptation of internally controlled students from Sultan Qaboos University studying Art Education specialization. Usually these students are selected after completing a series of tests. These tests include the student fluency in verbal and sensory forms, and flexibility in changing items included in the test. They also include alteration of past experiences in order to accommodate new experiences, and the extent of the existence of novel drawings and ideas shown by the students.

It is also suggested that studying in the Art Education specialization may contribute to the preference and development of sensory experiences during the interaction with these processes.

Moreover, the art experiences may develop the students' divergent abilities; (Hassan, 1993, 33). Spitz (in Woolfolk, 1990) showed that when students are exposed to more articulate sensory experiences their divergent abilities may develop.

The availability of exciting sensory experiences may help in improving the degree of students' academic adaptation. This holds true especially if they are internally controlled and have increasing control on what they encounter, and on their environment at large. In total, this may create the chances for the development of divergent thinking reflected in fluency, flexibility, and originality dimensions.

The abundant experiences which allow the student to express artistic creativity prepare him to get rid of his suppressed feelings, anxiety and tension. Thereafter the student's means of academic adaptation will improve. Moreover, much of the creativity tests concentrate on the use of verbal or sensory fluency forms, or the new original ideas. These are some of the components of the training programme for the students of Art Education in the university; (Al-Alfee, 1985, 486, Abu Nawarig, 1993, 211). Therefore, the Art Education students were chosen for the purpose of the present study.

The specification of the problem

The present study is specifically designed to study the relationship between the degree of divergent thinking means (fluency, flexibility, and originality) of the students from the Art Education specialization at Sultan Qaboos University - described as internally controlled, and according to their academic adaptation and sex.

The objectives of the study can be achieved by answering the following two questions:

- 1 - Are there any significant differences (at 0.05) between the degrees of divergent thinking means (fluency, flexibility, and originality) of students from the Art Education specialization, described as internally controlled, according to academic adaptation and sex variables?

Assumptions of the study:

The objective of the present study is to analyse the collected data in order to test the existing assumptions in the psychological and educational literature. These are:

- 1 - There are no significant differences between the degrees of divergent thinking means (fluency, flexibility, and originality) of students from Art Education specialization, with internal locus of control, according to academic adaptation and sex variables.
- 2 - There are no significant differences between the degrees of divergent thinking means (fluency, flexibility, and originality) of students from Art Education specialization, with internal locus of control, according to the possible dual interactions between academic adaptation and sex variables.

The importance of the study:

The present study relied on the relevant Arab psychological and educational literature (Hassan, 1993, 20; Mohammed, 1981; Abu Nawarig, 1993, 220; Al-Alfee, 1985, 478; McCabe, 1991, 11; Green and Levine, 1991, 251; Cawelti, Rappaport, and Wood, 1992, 84). Some conclusions from this literature revealed a relationship between Art Education specialization and divergent thinking, both analytically and conceptually. In addition, Art Education students at Sultan Qaboos university are usually selected according to some norms. These norms act as a necessary background that help the students to make use of the systematic experiences given to them in the different academic courses. These courses are expected to develop their abilities in a relatively creative form.

Moreover, the relationship between the internal locus of control, academic adaptation and divergent thinking variables included in the study may provide a suitable evidence for the efficacy of the academic courses taught in the specialization. This can be shown to be true in various ways. First, if there is evidence of the occurrence of divergent

thinking in the students' thinking. Secondly, if the students really make use of the teaching circumstances, of living in the university, and of the different activities there.

On the other hand, knowing the degree of academic adaptation of the sample will provide the researchers with an idea of the importance of factors influencing their academic improvement or impairment. Such a view will help in the development of a counseling plan to improve the academic performance. It also helps in selecting the pertinent activities which show the talents of these students. Furthermore, the selection of students according to the locus of control variable may give us an idea about the relationship between the abilities of Art Education students in controlling their physical and psychological environment, and the contribution of this in the development of their divergent and creative thinking.

In addition, the study of personality variables (such as sex, academic adaptation, locus of control, and divergent creativity) may contribute to the understanding of students of a special value to the Omani society. Creativity is deeply rooted in the Omani culture as shown in different forms in their past. The present government shows great interest in this respect. Hence, the creation of a new generation in this domain will help in the continuous development of Arab art as evidence of a cultured nation.

Review of Literature

The available literature has been analyzed analytically, conceptually and structurally in order to find the relationships that may relate the variables in the study. The objective will be to reveal the theoretical framework it is based on.

The review of studies in Arab and foreign psychological and educational literature provides theoretical basis necessary to justify studying the problem and answering the question. It is also suitable for

testing the assumptions of the study. Hence, studies and researches tackling variables related to divergent thinking and creativity were reviewed.

Locus of control

Refers to a person's beliefs about the nature and degree of control over life events. Some people feel personally responsible for the things that happen to them; these people are labelled internals. Others feel that their outcomes in life are determined by forces beyond their control; these people are labelled externals. Internals and externals react differently to success and failure; internals take pride in good outcomes and feel shame of bad outcomes, whereas externals experiences less intense emotions; (Qutami and Najib, 1993, 50).

People have the perception that what they do is either a function of their own behaviour which is under their control, or of the situational factors that are not under their control; (Layton, 1983, 149).

Classical studies reveal that people change their beliefs according to the outcomes of their deeds, whether they are discrepant with what the person already knows, unless the person can attribute the discrepancy to some external factors.

Julian Rotter (1975, 56) observes that locus of control (internality and externality) resembles a person's belief that what he achieves is attributed to some behavioral situation: internals attribute their achievements to effort and ability, whereas externals attribute achievement to external uncontrollable agents like destiny, luck and chance. Both external and internal control refer to causal attribution in behaviour.

Decharms (1968) pointed out that locus of control studies have focused primarily on the person's perception of an object or event. He also made the point that motives are viewed as causing some behaviour rather than as causal agents. He defines personal causation like knowledge of self as an agent of change in the environment; it is neither

a motive nor a goal, but a means of reaching a variety of goals. The need for personal causation reflects the need for the human being to be effective in his environment.

Findley and Cooper (1983, 2) found out that externals tend to exhibit less persistence at tasks. Others have found a positive relationship between internality and willingness to delay rewards in order to maximize them, and preference to perform in skill situations rather than in chance ones.

Julian Rotter (1975, 56) concluded that behaviour is determined by the degree of reinforcement, the level of expectation, and locus of control. He forseed a perception of locus of control to measure expectancy in future performance depending on locus of control formed through everyday experience on interaction with comrades, teachers and educational situations.

Phares (1976) concluded that internal children showed superior academic performance, but noted that such relation might be more substantial in children than in adults.

Lefcourt (1982) pointed out that the relationship between locus of control and academic achievement may be mediated by gender as well as by age. In addition, he found that the relation between locus of control and performance is more vividly positive in males than in females.

Findley and Cooper (1983, 2) drew two basic conclusions upon studying a quantitative review of research investigating the relationship between locus of control and academic achievement:

- a - Locus of control and academic achievement are significantly positively related.
- b - Such relation is more substantial among males than among females.

Kishor (1983, 397), Grasha (1983, 206), and several other researchers tried to list the personality traits that characterize individuals with high and low internal control. The following chart summarizes the results of their findings; (Qutami and Najib, 1993, 53).

Table No. (1)
Characteristics of High and Low Internal Control

High Internal Control	Low Internal Control
1 - Have perseverance, and do their best to perform a task whatever time it takes.	1 - Give up easily upon encountering difficult tasks
2 - Shoulder the responsibility of the optimal and dismal results of their behaviour.	2 - Shoulder the responsibility of behaviour only.
3 - Overcome all difficulties faced.	3 - Avoid difficulties and fail to accommodate
4 - Mild feelings of annoyance and fidgetiness	4 - Tense feelings of annoyance and disturbance.
5 - Encounter challenges.	5 - Avoid challenges.
6 - Seek knowledge that affects life.	6 - Leave things happen without interference.
7 - Amend defects and overcome problems	7 - Careless towards defects.
8 - Perceive themselves positively, and are aware of their strength and independence.	8 - Perceive themselves passively, and are aware of their weaknesses and content.
9 - Have less feelings of depression.	9 - Have more depression.
10 - Decision-makers	10 - Avoid taking decisions.
11 - More inclined to have university education.	11 - Not motivated to have university education.

Variables Affecting Locus of Control

a. Sex

People differ in explaining the reasons of the consequences of their behaviour and the level of internal control for such reasons. Males are found to have more internal control than females.

Reviewing all studies on the locus of control until 1971, Joe (1971, 619) concluded that, compared with females, male British students are characterized by high level of internal control. Besides, he noticed a positive relation between the achievement average of males and the level of internal control measured by any of the LOC tests.

Lefcourt (1982) concluded that the relationship between locus of control and achievement is more vivid in males than in females.

Deaux (1976) found that males are more internally inclined to anagram tasks than females. Deaux concluded that males have more internal control than females in cases of success while females have more internal control in cases of failure.

Other studies conducted by McGinnies et al (1974, 45) on students with different cultures from Japan, Australia, New Zealand, Sweden, Thailand, Mexico, and The u.S.A. proved that male students are more internally controlled than females.

Abdel-Basit (1993, 549) conducted a study titled “The relationships between locus of control and achievement motive among middle college female students in Oman”.

The Study revealed statistically significant differences between females with internal locus of control and those with external locus of control on their performance on achievement motive test in favour of the first group. No statistically significant differences between first and second year students were observed on the locus of control test.

It is possible to reveal the conceptual relationship between the internal locus of control and the degree of creative thinking. The student with internal locus of control is characterized by some traits that help him depend on himself, and be independent in his environment. Hence, he can observe what others cannot. He can depend on his experiences and conceptualization of things in generating opinions. He can adapt himself in order to control his environment. Alternatively, he may combine different elements in his environment in a way that gives a new outlook, either in opinions, solutions, or in creating a totally new thing.

From the preceding review of literature one can sense the importance of internal locus of control as a personality variable. It provides evidence showing that those with internal locus of control will either be outstanding in performance, or at least better than average individuals. Since this variable has not been studied before in an Arab environment, this will constitute the importance of the present study.

Sex and divergent thinking:

Creative thinking includes divergent thinking, and divergent thinking is the most advanced strategy in creative thinking compared to convergent thinking; (Guilford, 1968). These two strategies are influenced by environmental interactions and what the individual experiences. However, since the individual is grown up in a societal context during the socialization process, it is logical to assume sex differences in interactions with environmental and social variables.

One of the important studies in this connection (Hussain, 1974) looked into sex differences in divergent thinking. The sample consisted of 100 male and 100 female students from primary and preparatory levels. The Divergent Creative Thinking Scale was applied (fluency, flexibility, and originality). Females outscored male students in this test with a statistically significant difference. This was most evident in the Unusual - User Test. These results are incompatible with the prevailing belief that males are more divergently creative than females; (Hussain, 1974, 127).

Abdel Gaffar (1977) found significant differences in the originality thinking dimension, in favour of females. However, he reported no such significant differences in the flexibility dimension. Also in Singh (1979, 89), females outperformed males in the originality dimension. His study was designed to measure the students' abilities in the Divergent Thinking Scale and the creative personality dimensions.

Abdel Mageed's (1981) study showed no statistically significant differences between males' and females' scores in all dimensions of divergent thinking (fluency, flexibility, and originality).

A number of studies concluded that the performance of males in creative thinking is better than that of females (Tara, 1981, 959; Skukla, 1982, 128). However, other studies showed results favouring females; (Rodrigues and Soriano, 1993, 113).

The psychological and educational literature assumed that the locus of control forces the student to behave according to his motives, which control his adaptive behaviour. This is especially true for students with internal locus of control. Such a student is supposed to control his

environment and his life events; (Layton, 1983, 150). Hence a student with internal locus of control is more prone to control his judgments and ideas. He is also supposed to express his ideas in a more articulate way than others do. This is because he possesses a higher degree of independence. It is shown in the educational and psychological literature that males are more internally controlled than females; (Deaux, 1976; Abdel-Basit, 1993, 571; McGinnies et. al, 1974, 42).

From the preceding, we can infer that the individual with an internal locus of control may produce original ideas, and be more flexible in controlling his environment, and in communicating ideas to others. Moreover, he is more able to express his feelings and ideas.

Adjustment and divergent thinking:

Academic adjustment to university study shows how students interact with the academic activities, ideas and events made possible for them to practice in systematic or non-systematic ways. Hence, it is assumed that the more adjusted student is the most satisfied and fulfills his psychological needs according to the university regulations; (Baker and Siryk, 1984; Harris and Anttonen, 1985). It is also assumed that students with internal locus of control are more adjusted and exert more control on the environment around them; (Cowen, 1991, 404; Pavot and Diener, 1993, 165; Lazarus, 1991, 820).

Moreover, it is assumed that the most adjusted student is the most creative. The assumption relies on the idea that the internal locus of control, combined with a suitable degree of adjustment, provides the student with feeling of security and freedom. It also creates chances for him to freely express feelings and new ideas that strike him in order to improve his interactions with the environment. It is also concluded that the most adjusted student is the most productive, and more able to show his personal capabilities. This will in turn make him useful in his social environment; (1988, Huebner, 1994, 149; Smith and Baker, 1986, 87).

From the preceding review of studies that relate the academic adjustment with the sex of the subject, we can say that females show greater levels of academic anxiety than males; (Jindal and Panda, 1984,

19). Hart and Keller's (1980, 529) study was designed to discover the influence of some factors related to academic adjustment on the achievement level and some other factors (i.e. class size, initiation of ideas, style of performance, number of examinations performed, and communication style). The study showed females' lack of security feelings and confidence in their academic creative abilities while discussing serious issues with their male counterparts.

Astin (in Worchel & Goethals, 1985) showed that the university environment provides male and female students with different and varied reinforcements. Although female students perform better than male students in examinations, they do not appear to like continuing in study. It is also likely that their aspirations in obtaining higher degrees easily decreases. On the other hand, the aspirations of male students increases gradually with years of study. Such a situation is influenced by male students control processes and their future expectations shaped by those around them. Some of these expectations are their future position in society and vocational responsibility. In general this will be reflected in the students' divergent thinking. Females experience external control in order to please the power around them (parents, brothers, teachers etc.). Therefore their creative ideas are inhibited, while male students' ideas are encouraged, developed and reinforced. In this way, it is justified to expect an absence of creative thinking opportunities for females. In respect of adjustment, females are more likely to show obedience than males, which in turn inhibits their creative capabilities; (Woolfolk, 1990, 318).

Other studies were conducted to study students' academic adjustment and its relations to achievement and different mental processes. They showed that students in the early levels of study are less adjusted than those who spent more years in the university; (Stoner, 1981).

From the proceeding, it is possible to suggest that students' academic adjustment is influenced by their personal characteristics, style of thinking, academic performance, sex and the number of years spent in the university. Most of these factors may influence the student's level of practice, fluency and expression of ideas. It may also influence the ability to adapt past experience and attitudes in order to interact with

colleagues, teachers and the academic subjects. Moreover, it may influence the originality and uniqueness of ideas depending on experiences.

Method and Procedure:

Population and sampling:

The population of the study was all students, at all levels, from the Art Education specialization at Sultan Qaboos University. In total, there were 138 students, of whom 29 were male students and 109 were female students.

The Internal Locus of Control Scale was administered to select students with high internal locus of control. These were found to be 75, of whom 15 were male students and 60 were female students. Altogether they constituted the sample for studying the influence of the variables under focus on the students' divergent and creative thinking.

Terminology of study:

A number of specialized terms were used in this study. It is important to give conceptual definitions of these terms which may help to explain their inferences:

1. Divergent thinking:

It refers to how the student practices divergent mental processes embodied in creative fluency, flexibility and originality, as shown in responses to items reflecting each of these three dimensions.

The conceptual components of the three dimensions are shown as follows:

Fluency: To mention the greatest possible number of related ideas in fixed time intervals, measured by 12 items indicated by a 12-60 visual range.

Flexibility: The production of suitable responses to the proposed problem characterized by variability, rapid adjustment to change, the ease in changing responses to satisfy new situations. This was measured by 14 items, indicated by a 14-70 visual range.

Originality: Novel or uncommon ideas which are low in frequency of use among students because of their experiences and cognitive level. This was measured by 12 items, indicated by a 12-60 visual range.

2. Locus of Control:

Refers to the student's degree of control over events related to his study and achievement. The degree of internal control was determined by the scores obtained by the student in the improved Locus of Control Scale for University Students. The degree in this scale were determined by a visual range of 10-20 points. Ten was considered as the lowest degree of internal locus of control, whereas twenty was the highest degree of internal locus of control. The students who obtained eleven points and above were included in the sample.

3. Academic adjustment:

Refers to the student's degree of satisfaction about the relationships developed with academic subjects, colleagues, teachers and the organization of his time during university study. This degree of satisfaction is reflected in the student's responses to the especially designed and improved scale. The visual range of the scores was 112 for the lowest academic adjustment, and 280 as the highest, with a visual mean of 168.

4. Sex:

Both males and females were included in the test.

5. Independent variables:

These were sex and academic adjustment.

6. Dependent variables:

These were the degree of divergent fluency thinking, the degree of divergent flexibility thinking, and the degree of divergent originality thinking.

Limitations of the Study

The results of the present study are limited by the sample of the study, the instruments used to collect data, and the statistical analyses

used to answer the questions of the study. In addition, they are limited by uncertainty regarding the precise validity and reliability of the instruments used in sampling.

The Instruments of the study:

Three improved and adapted scales were used. They are considered in their new format as suitable for the sample. These scales were:

First: Internal Locus of Control Scale

The Internal Locus of Control Scale, which was developed and used in Jordan University, was administered in this study. For the Jordanian students, the reliability of scale, using the repeated test method, was '.89', and the validity of the scale, using the split- half method, was '.87'. In the present study these were '.88' for reliability using the repeated test method with a three week interval, and '.86' for validity using the split- half method. These results are acceptable for the purpose of the study.

Second: Academic Adjustment Measure:

The academic adjustment scale was developed relying on the available instruments in the Arabic psychological and educational literature (Baker and Siryk, 1984; Hueabner, 1994, 149; Keller, 1987, 268; Pavot and Dienar, 1993, 164; Kamman and Herbison, 1984, 91; Smith & Baker, 1986; Al-Shargawi, 1989; Morsi and Abdel Salam, 1984; Gamal Al-Lail, 1993, 188; Ismail, 1989, 4).

The content validity was obtained by the procedures used in the construction and the application of the instrument. Also an internal consistency of the instrument was found. The reliability of the instrument, using the repeated method with an interval of three weeks, was (.862). This result is acceptable for the purpose of the study.

Third: Divergent Thinking Scale:

Guildford's studies (1968) in the issue were thoroughly studied. He was the first researcher to use the 'divergent thinking' concept. He introduced the concept in his discussion about the intellect structure

idea. He assumed that divergent thinking refers to a sort of thinking in which intellectual activity is directed in different ways. Moreover, this type of thinking is characterized by the production of new and varied information and solution to problems. Divergent thinking, as mentioned earlier is shown in three processes known as fluency, flexibility and originality.

Fluency, Flexibility and Originality Test:

The development of the test relied on the psychological and educational literature. The items of the test were written in full sentence form to describe each dimension. In this connection, the researchers made use of the ideas of different psychological theories (eg. behaviourism, humanism and cognitive) in determining creativity and its dimensions. Moreover, students from Sultan Qaboos University who studied a course in educational psychology were asked to write items which for them constitute creative thinking. Altogether 77 full sentences describing creative practice were developed.

Then the 77 sentences in the three dimensions were written in such a way that measured one dimension, i.e. the creative thinking. These sentences were then given to 18 teachers from Sultan Qaboos University, all PhD holders in either education or psychology. They suggested the omission of 25 items with 80% and above agreement. The remaining items were 52.

Making use of operational definitions, the referees (i.e. teachers) were also asked to determine three dimensions of divergent thinking. They agreed upon the following components: fluency thinking. They agreed upon the following components: fluency thinking (16 items); flexibility thinking (18 items); and originality thinking (18 items). Then these dimensions were given to the students and applied in an initial form. The students referred to the ambiguity of some items. Therefore, all items said to be ambiguous by 50 of the sample were omitted. Hence, the items in each dimension became: 12 items for fluency thinking, 14 items for flexibility thinking, and 12 items for originality thinking.

Therefore, the final form of the test included 38 items across the three dimensions. This final form was then applied using a sample of 75

students from Sultan Qaboos University. This sample is similar to the sample of the study. The correlation coefficient between the score in each item and the total scores in each dimension were calculated. The results were: (0.931) for fluency, (0.843) for flexibility, and (0.912) for originality.

The preceding review provides validity inferences which lead us to rely on the results of the constructed measures with justifiable confidence.

In order to get the reliability inferences, the three measures of fluency, flexibility, and originality were first applied. Then a second test was applied after three week (test- retest). The results were (0.813) for fluency, (0.79) for flexibility, and (0.852) for originality. These results were acceptable for the purpose of the study.

Application procedures:

The locus of control measure acceptable for the Omani students in Art Education specialization was applied. The students who scored 11 and above on the scale were selected. The academic adjustment scale was also applied. The students who scored 112 and less, and those who scored 168 and above were selected. Then these students were asked to respond to the divergent creative thinking scale of fluency, flexibility and originality. Afterwards, we obtained scores for each student on each dimension, and these were analysed to answer the question of the study.

Statistical treatment:

The mean and the standard deviation for all variables of the study were calculated. The statistical significant differences were calculated using t-test. The two way analysis of variance was used for the calculation of the possible significant differences for the dual interactions between the study variables according to divergent thinking scores in the three dimensions (ie. fluency, flexibility, and originality).

The result:

In order to answer the questions of the study, the means and the standard deviations of divergent thinking scores (Fluency, flexibility,

and originality) were calculated. Also, the statistically significant differences were calculated using t-test. Also, the two-way analysis of variance was calculated in order to find the significant differences for the interactions between the study variables in the level of divergent thinking scores.

In the following sections we will review the results according to the three levels of divergent thinking in the following sequence - flexibility, fluency and then originality. A number of tables (1,2,3,4,5,6,7,8 and 9) were drawn to show and summarize the results.

The first table shows the mean and the standard deviation for Art Education students in creative flexibility dimension according to sex and academic adjustment level variables:-

Table 1
The mean and the standard deviation scores for creative flexibility
according to academic adjustment level and sex.

Sex	Academic Adjustment		Total
Males	Low	High	
	M = 24,89 SD = 11,67 N = 9	M = 25,67 SD = 5,72 N = 6	M = 25, 50 N = 15
Females	M = 35 SD = 19,38 N = 18	M = 5,66 SD = 10,52 N=42	M = 50,12 N = 60
Total	M = 31,63 N = 27	M = 52,73 N = 48	M = 45,14 N = 75

As shown in the table the scores of students of high academic adjustment were superior to those of low academic adjustment. These were (M=52,73; N=48 - M=31,63; N=27 respectively). The female Art Education students of Internal Locus of Control obtained the highest scores in creative flexibility (M=50,12; N=60).

In order to test for the significant differences between academic adjustment level and sex variables in creative flexibility, t-test was calculated. Table two below shows the scores across these two variables:

Table 2
The difference between the creative flexibility scores
according to academic adjustment levels and sex variables.

Variables	N	M	SD	t-value	P
Low academic adjustment	27	31.63	17.62	5.61	* 0.0001
High academic adjustment	48	52.71	14.38		
Males	15	25	9.5	5.49	* 0.0001
Females	60	50	16.86		

The table reflects significant differences in both variables (at 0.0001). Students of high academic adjustment scored higher in creative flexibility than those of low academic adjustment; similarly females scored higher than males on the same dimension.

The significant differences in the interactions between the study variables were tested. For this purpose the analysis of variance in the subjects' scores in divergent flexibility, according to academic adjustment and sex, was calculated. This is shown in table three below.

Table 3
The variances in the subjects' scores according
to academic adjustment and sex.

Variance Source	df	Vairance Total	Variance Mean	F	P
Academic adjustment	1	7677.71	7677.71	44.83	* 0.0001
Sex	1	7440.12	7440.12	43.44	* 0.0001
Academic adjustment x Sex	1	330.23	330.23	1.32	0.520
Error	71	12160.51	171.27		
Total	74	27608.57	373.09		

* 0,01 P

As shown in the table no significant statistical differences were found in the interaction between academic adjustment and sex variables in the students' creative flexibility scores. Hence, variables should be treated separately as far as flexibility scores are concerned.

Table four shows the students' mean and standard deviation scores at creative fluency dimension according to academic adjustment (high,low) and sex variables.

Table 4
The students' scores in the creative fluency dimension according to academic adjustment and sex variables.

Sex	Academic Adjustment		Total
Males	Low M = 20 SD = 8.49 N = 9	High M = 24 SD = 7.60 N = 6	M = 21.60 N = 15
Females	M = 29.88 SD = 15.07 N = 18	M = 50.57 SD = 9.38 N = 42	M = 44.36 N = 60
Total	M = 23.92 N = 27	M = 47.25 N = 48	M = 38.58 N = 75

The table reflects the superiority of females' mean scores in creative fluency (Females: M = 44.36; N = 60 and Males: M = 21.6; N = 15). Also, high academically adjusted students scored higher than low academically adjusted students (M = 47.25 and 23.92 respectively).

In order to test for significant statistical differences between the creative fluency scores' means according to academic adjustment and sex variables, t-test was calculated as shown in table 5 below:-

Table 5
The differences in creative fluency scores according to students' academic adjustment and sex.

Variables	N	M	SD	t-value	P
Low academic adjustment	27	26.59	13.88	6.53	0.001
High academic adjustment	48	47.30	12.72		
Males	15	21.60	8.11	5.74	0.0001
Females	60	44.34	14.75		

As shown in the table students of high academic adjustment scored better in creative fluency than students of low academic adjustment (means 47.30 and 26.59 respectively). Also, females scored better than males in the dimension (means 44.34 and 21.60, respectively).

In order to test whether there are significant statistical differences in the creative fluency scores of the students according to academic adjustment and sex, two-way analysis of variance was performed. Table six below shows the results of this analysis.

Table 6
Two-way Analysis of Variance of the scores in creative fluency according to academic adjustment and sex.

Variance Source	df	SS	MS	F	P
Academic adjustment	1	7373.87	7373.87	62.94	0.0001
Sex	1	6219.85	6219.85	53.09	0.0001
Academic adjustment x Sex	1	311.71	311.71	1.392	0.44
Error	71	8318.06	117.16		
Total	74	22223.49	300.32		

As shown in the table, no significant differences exist for the dual interactions in creative fluency scores according to academic adjustment and sex. Hence, the interaction between academic adjustment and sex is not important in explaining the creative fluency scores.

Table seven below shows the means and the standard deviations of the students' original creativity scores according to sex and academic adjustment.

Table 7

The students means and standard deviation scores in original creativity dimension according to sex and academic adjustment.

Sex	Academic Adjustment		Total
Males	Low	High	
	M = 42.70 SD = 13.60 N = 9	M = 44.0 SD = 16.40 N = 6	M = 43.22 N = 15
Females	M = 50.20 SD = 13.80 N = 18	M = 42.90 SD = 17.60 N = 42	M = 45.03 N = 60
Total	M = 47.56 N = 27	M = 43.04 N = 48	M = 44.67 N = 75

The table shows the superiority of the females's scores over the males in original creativity (M=45.03, N=60; and M=43.22, N=15 respectively). Also, students of low academic adjustment scored better than students of high academic adjustment in this dimension (M=47.56, N=27; M=43.04, N=48 respectively).

Moreover, the significant differences between the study variables were calculated (table 8). As shown in the table, no significant differences were found between students of Art Education, with internal locus of control, both at sex and academic adjustment variables.

Table 8

The differences in creative originality scores according to students' academic adjustment and sex

Variables	N	M	SD	t-value	P
Low academic adjustment	27	47.56	13.92	1.17	0.25
High academic adjustment	48	43.00	17.30		
Males	15	43.00	14.20	0.38	0.70
Females	60	45.00	16.8	2.17	

In order to test for the significant differences in the interactions between the study variables in original thinking scores, two-way analysis of variance was performed. The results are shown in table 9 below:-

Table 9
Two-way analysis of variance of the scores of the sample in original thinking according to academic adjustment

Variance Source	df	SS	MS	F	P
Academic adjustment	1	358.61	358.61	1.36	0.25
Sex	1	38.90	38.90	0.15	0.70
Academic adjustment x Sex	1	290.64	290.64	1.10	0.30
Error	71	18769.14	253.63		
Total	74	19457.29	262.93		

As shown in the table, no significant differences were found between the two levels of academic adjustment (high, low) or sex (males, females). Also, the interaction between the two variables proved to be statistically insignificant. Hence, academic adjustment, sex and their interaction did not explain the scores of Art Education students, with internal locus of control, in creative originality.

Discussion

The results of the present study will be discussed with reference to the results of Arabic and foreign studies and the evidence produced to support or contradict the present study.

The distribution of the fluency, flexibility and originality mean scores in the sample varies across these three dimension. The overall mean of Art Education specialization students in creative flexibility is ($M=45.14$; $N=75$), whereas the theoretical mean is 42. The overall mean for creative fluency is (38.85 ; $N=75$); whereas the theoretical mean for this dimension is 36. The overall mean for creative originality is (44.67 ; $N=75$), whereas the theoretical mean here is 36.

The preceding results clearly indicate an above mean performance by the students in the three dimensions of divergent thinking (i.e. fluency, flexibility and originality). This may support the hypothesis that there exists a relationship between the characteristics of the student and the specialization to which he belongs. In other words, the specialization reinforces the students' divergent thinking abilities and

helps them in developing creative abilities along the three dimensions. This supports what is hypothesized by many researchers; (Hassan, 1993, 20; Al-Alfee 1985, 477; Abu Nawarig, 1993, 220). They believe that Art Education specialization courses and experiences may develop and enhance the students' abilities in different age groups. Furthermore, they think that creativity can be developed in well-organized circumstances under the control of planners and executors of the programmes. Organized teaching programmes may create the best avenues for students to show and enhance their abilities.

The study established significant differences in the students' scores in flexibility thinking dimension according to sex and academic adjustment. The differences were in favour of students of internal locus of control who showed high academic adjustment. It is sensible to attribute this to the fact that students with suitable academic adjustment are more equipped to make use of the systematic experiences they are exposed to. The specialization also provides the student with flexibility and readiness to deal with the varied experiences encountered in the specialization; (Hassan, 1993, 21; Abu Nawarig, 1993, 222).

The females outperformed the males on the flexibility thinking dimension. This may be attributed to the nature of the female. During the socialization process and schooling, females are trained to accept and obey for a longer period in the first years of life; (Phares, 1976, Abdel-Basit, 1993, 550).

On the other hand, however, no significant differences were found in the interaction between academic adjustment and sex. That is, students with internal locus of control were not influenced in their divergent thinking (flexibility) by sex or academic adjustment. The researchers observed that the interaction was not an issue in the previous studies. We may justifiably say the interaction between these variables will not give more information about flexibility in the study.

In the fluency dimension, the females' scores were also superior to those of males. It is plausible to suggest that this may be due to the nature of females' responses. Females usually do their best to make use of what is provided to them. This in turn will develop their creative thinking (fluency). In addition, females are fluent by nature in

expressing their feelings and ideas in specific words. Some of them continue to be superior to males in this dimension up to the end of the school years, and may be beyond that. The results of the present study are similar to those of (Hussain, 1974, 128; Singh, 1979, 70; Rodrigues and Sariano, 1983, 14). However, they contradict the results of the studies of (Abdel Gaffar, 1977; Skukla, 1982; Tara, 1981 960). It is logical that the students with internal locus of control and high academic adjustment will obtain high scores in fluency, express ideas or mention the greater possible number of ideas in a certain subject matter. This may be because they are more stable and involve themselves more with experiences delivered to them; (Abdel-Basit, 1993, 550; Woolfolk, 1990; Kamman and Herbison 1984, 93).

The differences in the fluency scores for students according to academic adjustment was in favour of those with high academic adjustment. The result goes in line with the theory available in the psychological and educational literature. This explanation was supported by the good performance of female students due to the fluency variable.

On the other hand, no significant differences were found in the interaction between fluency and academic adjustment variables. Thus, the two variables together may not explain the scores in the fluency dimension. However, each one separately explained the scores along this dimension.

The divergent thinking scores were partially close in both flexibility and fluency dimensions. However, this was not the case in the originality dimension which includes mentioning rare occurrence ideas or opinions.

Like the results in the other two dimensions, the scores of female students in the originality dimension were also better than those of male students. Unexpectedly, however, those with low academic adjustment obtained higher scores than those with high academic adjustment. This may be because originality is more associated with uncommon responses, and less with the overriding norms or instructions. Hence, the students who do not follow, or rely much on the instructions and the texts are more creative. The results of the present study support

Hussain's study (1974, 129) especially in the students' use of uncommon ideas. The sample in Hussain's study were female students from the high socio-economic society. Such girls encounter less controls in expressing their feelings. These results were also supported by the Singh study (1979, 91). However, the results of the present study were contradicting to Mussa & Dusuki, (1988, 103).

The t-test analyses showed no significant differences in the divergent thinking scores (originality). According to sex and academic adjustment. The same holds for their interaction. Therefore, we think the nature of this type of divergent thinking needs more studies. The emphasis here should be directed to identifying the nature of responses elicited by students with internal locus of control from Art Education specialization. The statistical analyses and procedures adopted in the present study did not show clear implications in this regard.

Recommendations:

The results of the present study and its relevant psychological and educational literature direct the attention to a number of issues, as follows:

- 1 - It is important to study the students' divergent thinking phenomenon in different specializations because of the importance of this type of thinking. The objective here will be to develop, maintain and create suitable opportunities for such thinking.
- 2 - It is important to study demographic variables which may influence, or be closely associated with, the divergent thinking of students with internal locus of control from Art Education specialization.
- 3 - The originality dimension in divergent thinking needs more detailed studies. The results of the present study gave no significant evidence, except the absence of significant differences according to the variables of the study. It may be the case that the students' original thinking is not yet mature in this specialization. Moreover, the originality thinking has a distinctive nature which makes it different from fluency and flexibility thinking.

According to the researchers' knowledge the present study is distinctive in its subject matter, research and the variables studied. It also provides the instruments that help in identifying the nature of university students' thinking in different specializations. Moreover, the study is useful in its provision of evidence for the importance of academic adjustment for the study of divergent thinking in the fluency and flexibility dimensions.

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التفكير التباعدي لدى طلاب تشعيب التربية الفنية بجامعة السلطان قابوس

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الملخص

استهدفت الدراسة بحث علاقة درجات التفكير التباعدي (الطلاقة، المرونة، الأصالة) عند طلاب من تخصص التربية الفنية من ذوي الضبط الداخلي وجنسهم وتكيفهم الأكاديمي في جامعة السلطان قابوس.

بلغ أفراد عينة الدراسة (٧٥) طالباً وطالبة موزعين إلى (١٥) طالباً و(٦٠) طالبة. تم تطبيق مقياس موقع الضبط الداخلي، ومقياس التكيف الأكاديمي، ومقياس الابداع التباعدي (الطلاقة، المرونة، الأصالة) المطورة والمكيفة للطلاب العمانيين.

من أجل الاجابة على أسئلة الدراسة تم استخراج المتوسط والانحراف المعياري من أجل تحديد اتجاه النتائج. كما تم استخراج (ت) لدلالة الفروق، وتحليل التباين الثنائي لاختبار دلالة الفروق في التفاعلات الثنائية.

أظهرت نتائج الدراسة وجود فروق في التفكير التباعدي (الطلاقة، المرونة) بين الجنسين وبين مجموعتي التكيف الأكاديمي وذلك لصالح المتوسط الأكبر. بينما اختلف الأمر بالنسبة لدرجات تفكير الأصالة. وما زالت أبعاد التفكير التباعدي لطلاب التربية الفنية من ذوي الضبط الداخلي بحاجة للمزيد من البحوث والدراسات.

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