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The Role of the Learning Environment of the Faculty of Education at Najran University in the Development of Scientific Thinking

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Abstract
This research aimed to identify the role of the learning environment of the faculty of education at Najran University, KSA, in developing the scientific thinking style of its students. This required identification of the extent of respondents choose the scientific, religious or superstitious thinking style in interpretation of life and social situations presented to them. Using 't' test, there was statistically significant differences between the first university level female students and the same level male students, for females, in choosing the scientific thinking style to interpret the life and social situations that the first research tool contained. However, there was no similar statistically significant differences between the final level female and male students. Although there were statistically significant differences in the choice of scientific thinking style among male students of the first level and the final level, for the final level, which can be attributed to the influence of the learning environment, the females did not show such differences. These results, in addition to the opinions of teaching staff, both sexes (using the second research tool), that the learning environment has an average impact on developing the scientific thinking style, showed weakness of this environment.
Keywords: Scientific Thinking Style, Religious Thinking Style, Superstitious Thinking Style, Learning Environments, Faculty of Education, Najran University

1. Introduction

The ability to think is the most powerful capability in man life. His superiority over other creatures is attributed to this capability. Man is not the strongest, the largest, nor the most sensitive animal, but he has this kind of thinking that enabled him to control the nature and its components (Henry 2012).

If we look at human behaviour in any life situation, we find that it is in the light of the thinking in it: identifying the problem, recognizing the elements of the situation, specifying the target, developing a plan, and choosing the means. As a result, we modify our behaviour at every step depending on the requirements of the situation, if it is incomplete or skewed; the behaviour is accordingly far from the right. Anyone who attributed the disease to evil spirits, may resort to be cured by incantations and amulets, and assisted by magicians and charlatans, and ignore the real causes of his illness, which may eliminate his life. Who believes that what happens to his, good or bad, is due to the positions of the stars when he was born, or when he tries to implement his projects, ignoring the real causes of failure or success. Therefore, he randomly moves around in his life, loses the beneficiary of grace of mind and appropriate thinking in developing his life and achieve his dreams.

Thinking is not one type; it differs in terms of its purpose and style. In terms of purpose: it may aim to generalize or uncover the laws governing different phenomena, to increase knowledge of the properties of objects and the mysteries of the universe. It may intend explanation or reasoning, or aim to practical application, trying to get benefit from the study of rules and laws to achieve certain goals (De Bono 2001).

In terms of style: there is a trial and error, who resorts to the other in order to think on his behalf, who thinks superstitiously, and who takes into account the precision thinking and adheres to reality and seeks the concrete evidences, which is the scientific thinking style.

2. Research issue

If scientific thinking 'cumulative' in nature, and if the history of Muslim Scholars, no doubt, was full of the production of science and knowledge that contributed directly in the construction of contemporary global civilization, it is undeniable also that the descendants of these scientists provided nearly nothing in science and knowledge. Thus, we lost this 'accumulation', which it is to not be achieved without the adoption of the scientific thinking type as a general way of regular people life, not of scientists only.

Human beings acquire the thinking style through the environment in which it arises. It is not limited to what they acquired from the educational institutions, curricula and scientific materials, but the nature of the design of these courses; teaching methods; using of technology in teaching; humanitarian and social relations between teacher and learner, teachers each other, all the parties in the educational institution; regulations; and the

general climate. All contribute to establish the prevailing thinking style in the minds and souls of students, and become the mainstream in their thinking style.

Scientific civilization, which we live today, is carried out by scientific thinking that still is the backbone behind the continuation of this civilization and its evolution. This type of thinking has led to these discoveries and scientific inventions, and technology that provides the contemporary human being means for the betterment and well-being, and saves the time that they spent in many complex processes that were draining their time and efforts. If there are well known negative aspects of this spread of technology, the scientific thinking style is entrusted to disclosure, and fight those aspects, to promote positive aspects, by offering the rationalization of its use, and directing it to what is consistent with the rules of the mind. These rules are not inconsistent with the rules of spiritual faith in first place.

3. Research objectives

Therefore, the main objective of this research is to identify the role of learning environment factors of the Faculty of Education at Najran University in terms of what it presents to form the students' thinking style, and improves their research skills. This is to identify the factors that give way to the promotion of the positive aspects available in the Faculty of Education environment, and modify the negative aspects, allowing developing a strategic vision to develop the students' scientific thinking style.

To achieve this main objective, the following objectives are to be considered:

- Identify the prevailing thinking style among students of the Faculty of Education at Najran University.
- Identify the status of scientific thinking style compared to other methods of thinking among those students.
- Identify the extent of the effect of each of the following variables in acquiring the students such thinking style:
  - Courses
  - Teaching methods.
  - Technology available and used in teaching.
  - Human and social relations between the faculty staff and students.
  - Extra-curricular activities.
- Suggest procedures and means to enhance the Faculty of Education learning environment to promote the positive aspects contribute to developing the scientific thinking style of students, and modify the negative ones that hinder this developing.

4. Methodology

Descriptive analytical method was used to explore the literature related to the scientific thinking style, and the methods of its developing, as well as the learning environment and its impact on the learners.

According to this literature, a tool consists of facts or events was designed and arbitrated. The students were asked to choose one of three given explanations that each represents a certain way of thinking. It was designed in a way that does not imply any preferential style of thinking. These events and facts included the related factors of the learning environment. This tool was applied to male and female students of the first and the final levels (40 male and 40 female of each level, 160 students in total).

Another tool was designed arbitrated and applied to male and female faculty staff to identify, from their perspective, the role of scientific contents of courses they teach, the ways they use to solve students' personal problems and life and social difficulties they may face, teaching methods they use, and the available technology, in devolving the scientific thinking style.

5. Literature

Scientific thinking style, in this research, does not mean only that way of scientists' thinking, but rather that systematic logical manner everyone can use in the affairs of our daily lives, in the activity that we are making when we exercise our usual work, control our relations with the people, or understand and deal with the world around us. All that is required in this thinking style is to be logically organized, and is built on a set of principles that we unconsciously apply in every moment, such as: it is impossible to confirm the thing and its opposite at the same time, or each event is a result of some concrete cause.

Science effects do not affect scientists only; it has affected most people who do not actually recognize the scientists' efforts, details of their works, or the methods they use. The most effect is the thinking style that has not been available before the era of science. Man used to think in such disorganized ways that delayed the ripening of man mind until the contemporary era (Zakaria, 1978; Henry, 2012).

If the scientific thinking is fundamental in the world of discoveries and inventions, which are of the pillars of our time, it is also essential for the progress of arts, sports, and social studies, and establish crafts and industries. Despite the success of the human progress made because of the use of scientific thinking in the fields

of natural science, it did not achieve such success in solving social problems by following this method of thinking. This may be because of multiplicity of factors involved in the problems of life, and overlap, and influenced human thinking in these problems by emotions, and general culture of the society and dominant views and beliefs. Besides, there are advertising, and media, with their effects of abolition of reason and proper scientific thinking, for promotion the interests of advertisers, or politicians (Høyrup, 2004).

There is no doubt that one job of education is to teach people how to think in such way that leads to improve living conditions, building the civilization, and developing the society. If the man is born and has the ability to think, by the Almighty Allah, however this ability needs training and mentoring. The education process cannot achieve this task alone, but many social factors must participate, including general cultural climate, which the learning environment presents only one of them (Harris, 2002).

Human beings have been influenced by many social, intellectual, and psychological factors in his intellectual and social life. These factors prevented the progress in some eras, but helped the way forward in others. Perhaps the most notable example of this is what was done by the Islamic civilization at a time when Europe was mired in intellectual slavery, and the resulting cultural backwardness. However, the boom of Europe starting from the Renaissance, and accompanied by the weakness of the role of Muslim thinkers, to turn the case.

There are still some people attribute the falling ill, loss or misfortune to the 'eye' and 'envy'. They explain earthquakes as a result of that 'bull', which holds the land, when conveyed it from one horn to the other, and the volcanoes are the fury of the gods, or actions of demons. Human beings seek the treatment and evade the evils of natural phenomena by offerings, amulets, and the use of magic and incantations. All these mingled with religious and spiritual beliefs (Trefil, 2010).

This superstition has become part of the social heritage, its impact is no longer limited to the ideas and ways of life, but also conquered the emotions and personal life. There are still in our communities who hang dead and dried lizards and crocodiles on their doors, draw palms on the walls, and treat diseases by burning incense. So, it is not easy to dispose such beliefs, it needs a long training on the use of sound thinking methods, the school and university are the first social institutions have to play this role (Kenn, 2005).

By studying the foundations of the renaissance and the development and progress, the mind does not make mistakes in detecting that scientific thinking is the key. Man view to the universe, dealing with nature, and social problems has changed, due to the changing of thinking style. This style invited man to use his senses, analyze the findings of his perceptions mentally and logically, and make decision and modify behavior in accordance with those results, rather than relying on illusions, or uncritically on what the ancients believed in (Harré, 1970).

If we compare between opinion that attributes the disease to spirits and demons, and that views it caused by minute microorganisms, we will find that the first view is not bolstered by factual evidence can be verified. While the second opinion based on accurate and specific steps, field studies that can, therefore, be taken as the base of practical decisions lead to treatment of diseases, and prevention, while belief in the validity of the first opinion but lead to further spread of the disease, and increase the severity of (Martin, 1997).

Thinking is obligatory in Islam. When the work of human mind is an order of the Creator, as evidenced by the large number of verses of the Quran, it is refrained on the creature to disrupt his mind to please any creature like him, or because he is afraid of his. The Quran polls three major contraindications to use of reason: ... the largest is ancestor worship called the convention, blind following the religious authority, and the humiliating fear of the owners of worldly power. Islam does not accept from Muslims to eliminate his mind to obey his fathers and ancestors' mores. Islam does not accept to cancel Muslim mind yielding to anyone who uses the name of religion, and does not accept him to cancel his mind awing from the oppression of the powerful (Alakkad, N.D.).

Islam's view of science can be traced in the hard-working scientists' efforts in every era of Islamic history, which successive generations of its strengths and weaknesses, progress and delays, and activity and inertia. Islamic Nations has passed ages backward ignorant of where ignored Islam itself. Therefore, they were far from science and religion at the same time. Nevertheless, the history of Islam has never been without diligent Imams derived their freedom of thought from the fountain of this vital force. They has kept the real message of this religion, which is compatible with the message of science and its purposes" (Saedan, 1988).

There are some related studies and researches. Most of these studies, however, explored one thinking style (Saenko, 2005; Alkadri, 2005; Alkhatib, 2007; Altarawna, 2010; Ruslan, 2011; Tashtosh, 2011; Welson, 2011; Alsharaf, 2013; Alqada, 2013; Almihtaseb, 2013; Alrabee, 2014; Alrfooh, 2014) or more (Coll & Lay, 2008; Altarawna, 2010), and some focused on one element or more of the learning environment, especially teaching methods (Akhtar, 2009). The disclosure of the role of the learning environment in acquiring university students scientific thinking style or developing it among them to become a way of thinking in their social and personal lives, had not been dealt enough. This indicates the importance of the current research.

On the other hand, the findings of these studies are not consistent. Some results confirm that there is no statistically significant differences in the use of scientific thinking style between males and females (Alkhatib,

2007; Alrfooh, 2014), between school levels (Alrfooh, 2014), or according to students' accommodation (Tashtosh, 2011). Other studies, however, confirm the existence of statistically significant differences according to one or more such variables (Tashtosh, 2011; Aljibaili, 2013; Alqada, 2013; Almawajda, 2013; Alrabee, 2014), but they differ about for which group. This indicates, once more, to the importance of the current study, and clarifies the need to conduct more in-depth, accuracy researches contains more variables, to be applied to a larger number samples. This requires a large research bodies to conduct this kind of research, to reveal the reality of scientific thinking style, especially among Arab universities students, emphasis on the importance of culture as a critical variable in propagation the scientific thinking style as a necessary means in the development of our societies.

6. Results

6.1 The Prevailing and Preferred Thinking Style among Students

To identify the prevailing of this style, frequencies and percentages were calculated and presented in table 1, which showed that the religious thinking style was the most chosen one by the first level male students. The scientific style was the second choice, while the superstitious style was the last. While the scientific style was the first choice of the last level male students. The second choice was the religious, then the superstitious.

To test the statistic deference between these two groups, 't' test was used. Table 2 showed that there were statistically significant differences, for the last level.

Table 3 showed the frequencies and percentages of the prevailing thinking style of the first and last female students. It is obvious that while the first level female students chose the scientific thinking style more than the other two styles, the last level female students shoes the religious style instead.

To test the real deference between the two female groups, 't' test was used. Table 4 showed that there were not statistically significant differences.

To compare the choice of scientific thinking style by the first level male and students, 't' test was used to explore if there were statistically significant differences between these two groups. Table 5 showed there were such differences for female students. However, table 6 showed there were not statistically significant differences between the last level male and female students.

6.2 The Effects of Learning Environment Variables

These effects can be traced by the above-mentioned results. However, using "relative weight" equation, the faculty staff, both sexes, gave the teaching methods the highest affective variable. The other variable have average effects.

7. Conclusion

Table (5) shows that the students of the first level female students chose the scientific thinking style to interpret the positions offered to them with statistically significant differences for the same level male students, suggesting that female students had a strong tendency towards this style of thinking. This result confirm the results of (Alrabee, 2014). However, this interpretation cannot be appropriate when looking at Table (6) that showed no statistically significant differences between the last level female students and male students of the same level. This could be due to the learning environment factors that could achieve some progress on using the scientific thinking style. It can be supported by the faculty staff opinions. Once again, if this interpretation was true, the difference should have been statistically significant between the choice of female students of the first level and the last level, but the result indicated by table (4) showed that this style had not been developed enough, contrary to the findings of (Almihtaseb, 2013) study. Table (3) assures that the use of female students of the last level of the scientific thinking style has lost ground against the religious thinking style, which is consistent with the study results of (Aljbaili, 2013). Therefore, the learning environment factors may have led to the opposite of what female staff said. The use of the female students of religious thinking style has increased after exposure to the learning environment factors, that is supposed according to the views of female staff, they had large and moderately contribution to the development of the scientific thinking style.

The opinion of male teaching staff that the learning environment factors contribute to the development of the use of the scientific thinking style, high and average, can be accepted based on what shown in Table (2), i.e. there are statistically significant differences, in favor of last level male students in using this style. It is, therefore, possible to say that male teaching staff actually use the learning environment factors to develop this style of thinking.

On the other hand, the agreement of teaching staff, both sexes, that most of the learning environment factors in the Faculty of Education contribute moderately in developing the scientific thinking style, explains that there is a deficiency in these factors for achieving one goal of basic educational process in Najran University. This goal is developing the scientific thinking style outside the classroom and answer sheets, to become a way of life, contributing to the advancement of the personal life of male and female students, and what will they provide

to their students after graduation teachers and teachers, which, in turn, contributes to the deployment of the scientific thinking style in society.

There is no doubt that this rate of approval about the contribution of the environment factors in the development of the scientific thinking style, indicates that the general social and cultural factors have a greater impact in the rule of religious thinking style, compared to the scientific thinking. Islamic religion emphasizes the necessity of using the mind in the affairs of life, and that this is a duty and an obligation, not a luxury. However, the real practices, and the most widespread interpretations are not based on this clear religious principle. This is in line with what indicated by the study of (Alsharaf, 2013). On the other hand, the dividing line is not clear enough between interpretation of life situations as they are just matter of Fate, or as a result of the intervention of some forces not sanctioned by the mind, that are not sanctioned by religion in origin.

Based on these results and discuss, the following procedures could contribute to develop the scientific thinking style among students of Faculty of Education at Najran University, through the development of learning environment factors (Freiberg, 1988; Allod, 2009; OECD, 2009).

It is agreed that steps of scientific research are: identify the problem, impose hypotheses that help solving it, choose the most probable hypothesis, and test the validity of the hypothesis by observations, experiments, and logical reasoning, to reach a result finally. The learning environment enables the use of those steps by many ways, which lead to development of scientific thinking style to go beyond the purely scientific issues, become a way of thinking which the students should use in their lives, and interpret any natural or social phenomenon (Thouless, 1979).

The teaching methods advocated by specialists in education in recent decades, in particular, and considered one of the best and most powerful teaching methods influence on the style of scientific thinking development, is ‘problem solving’. It is recommend that such ‘problem’ should be highly relevant to the learner who could consider it his own problem, realize its importance, and then seek to work to resolve. Nevertheless, when the issue turns to a series of questions, and the teacher thinks s/he trains the learner to solve the problems, s/he in fact offends the use of this teaching method. It is true that every problem can be formulated in question(s), but not every question represents a problem. A question may be considered a problem from the viewpoint of the teacher, but it is not so for the student, if it does not affect her/his life. If the teacher could not show the extent of the problem link the lives of students, this teaching method will not lead to any desirable result.

In order to enable the teacher to raise students' interest in a problem, and clarify the extent it relates to her/his life, she/he has to be: a) familiar with the parties to the scientific material provided, b) fully aware of the characteristics of the psychological and mental development of her/his students, c) know the conditions of their environment, society and prevailing culture.

Extra-curriculum is a method can be used to make a problem vital to the students, and push them to percept that this problem affects her/his personal and social life. Introducing an exciting experience, analysing current events, especially that have a clear link with students’ community, or a field trip, can illustrate to the student how far the posed problem touch her/his life, and how to take advantage of the scientific thinking style in the interpretation and resolution.

Other methods can be used to develop scientific thinking style include: 1) Telling scientific stories and encouragement to read such kind of stories. 2) Using the practical and field studies in emphasising on the use of using logic. 3) Discussing and reviewing the worn and spread myths and beliefs in the local culture. 4) Establishing the curricular based on social and life problems as much as possible. 5) Providing not the ideas, information and solutions that can the student acquire by her/himself. The staff member should always urge her/his students to acquire information using the appropriate methods to gather, and display the findings. If, for example, s/he displays several theories, s/he can provide a model for the criticism of one theory, and the students are asked to analyse and critique other theories, guiding them to how to do this criticism. 6) Periodical and final tests should provide models of problems require new solutions may not have been subjected to during the course, but require the student to gather ideas, theories and opinions that can be relied upon to provide the solution. 7) Teaching staff should be aware of her/his own ideas and beliefs, and review teaching methods and the types of questions she/her use.

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Table 1. Frequencies and Percentages of Prevailing of Thinking Styles, First and Last Level *Male* Students

Level	First		Last	
Thinking Style	Freq.	%	Freq.	%
Scientific	152	38.0	186	46.5
Religious	176	44.0	174	43.5
Superstitious	72	18.0	40	10
Total	400	100	400	100

Table 2. 't' Test Paired Two Sample for Means: The Statistically Significance of Differences between the Means of Using Scientific Thinking Style among the First and Last Level *Male* Students

First Level	*Last Level*	
3.8	4.65	Mean
2.574358974	2.848717949	Variance
40	40	Observations
	-0.130663775	Pearson Correlation
	0	Hypothesized Mean Difference
	39	df
	2.171158038	t Stat
	0.018033235	P(T<=t) one-tail
	1.684875122	t Critical one-tail
	0.03606647	P(T<=t) two-tail
	2.02269092	t Critical two-tail

Table 3. Frequencies and Percentages of Prevailing of Thinking Styles, First and Last Level *Female* Students

Level	First		Last	
Thinking Style	Freq.	%	Freq.	%
Scientific	193	48.25	176	44.0
Religious	163	40.75	185	46.2
Superstitious	44	11	39	9.8
Total	400	100	400	100

Table 4. 't' Test Paired Two Sample for Means: The Statistically Significance of Differences between the Means of Using Scientific Thinking Style among the First and Last Level *Female* Students

First Level	*Last Level*	
4.825	4.4	Mean
2.096794872	3.169230769	Variance
40	40	Observations
	-0.151190351	Pearson Correlation
	0	Hypothesized Mean Difference
	39	df
	-1.093206871	t Stat
	0.140504873	P(T<=t) one-tail
	1.684875122	t Critical one-tail
	0.281009747	P(T<=t) two-tail
	2.02269092	t Critical two-tail

Table 5. 't' Test Paired Two Sample for Means: The Statistically Significance of Differences between the Means of Using Scientific Thinking Style among the *First Level* Male and Female Students

Female	*Male*	
4.825	3.8	Mean
2.096794872	2.574358974	Variance
40	40	Observations
	0.139057178	Pearson Correlation
	0	Hypothesized Mean Difference
	39	df
	-3.231252666	t Stat
	0.001253132	P(T<=t) one-tail
	1.684875122	t Critical one-tail
	0.002506263	P(T<=t) two-tail
	2.02269092	t Critical two-tail

Table 6. 't' Test Paired Two Sample for Means: The Statistically Significance of Differences between the Means of Using Scientific Thinking Style among the *Last Level* Male and Female Students

Female	*Male*	
4.4	4.65	Mean
3.169230769	2.848717949	Variance
40	40	Observations
	0.022187434	Pearson Correlation
	0	Hypothesized Mean Difference
	39	df
	0.651794907	t Stat
	0.259178223	P(T<=t) one-tail
	1.684875122	t Critical one-tail
	0.518356445	P(T<=t) two-tail
	2.02269092	t Critical two-tail