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# The Scientistic Attitude of a Group of Female Graduate Students in Iran: Evaluation of Master's Theses across Time

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## *Abstract*

Having an all-girl university creates the expectation for having quality university products. Hence, the evaluation of the master's theses of the graduates across time could not only reveal the effectiveness of the university curriculum, but any progress that might have taken place. 44 theses from five colleges were randomly selected and evaluated by two independent evaluators. The results support the research hypothesis in that the scores did not show high quality theses and no positive change over time. Review of the contents, methods, and instruments in university teaching could lead to improvements in scientistic attitude and university products.

***Keywords:*** Scientistic Attitude; Evaluation; Master's Theses;

## THEORETICAL FRAMEWORK

While the concept of university is taken by some (Brew, 2001) to mean a place for systematic explorations aimed at creation and control of uncertainty, and some (Barnett, 1997) consider university as responsible for facing the universe and lessening the unknowns about it, the term **daaneshgaah**, the Farsi word for university, primarily means the place of knowledge/knowing. Nevertheless, the secondary meaning of the word **daaneshgaah** is "the place of science" since science is considered to be equivalent to knowledge and knowing rather than an activity! As such, the universities in Iran should be the very bastions of scientistic attitude and scientific culture and the quality of academic activities therein should be outstanding, especially in an all-girl university with the stated objective of producing high quality products (Rahnavard, 2003). Yet the quality of higher education in Iran, like in many other places, is in need of improvement (Hameedy, 1999; Nafeesee, 1996; Mansooree, 1995). The main purpose of this study is to help with the process of improving this quality by identifying a major qualitative index, scientistic attitude, and ways that it can be manipulated in order to bring about positive changes in the quality of university learning; in other words, by recognizing the development of scientistic attitude as a major goal of university education and as reflected in university products like theses. The second purpose of this study is to highlight the significance of evaluation as a scientific activity that is both indicative of scientistic attitude and also helpful in bringing it about and/or strengthening it. There are many indications that render such an undertaking necessary (Baazargaan, 2001; Hameedy, 1997; Mahjoor, 1997).

If the development of scientistic attitude is one of the main purposes of the university education, then there must be a common and consistent understanding of the basic concepts and methods of science reflected in any one of the university products such as the graduates' theses and dissertations. What is meant by attitude, according to *Weiten* (2000), is the set of all learned cognitive, affective, and behavioral responses of a person to things, people, and events. Furthermore, what is meant by the scientistic attitude is the attitude similar to that maintained by a scientist toward the universe. The cognitions, affections, values, and skills that a scientist holds determine his/her habituated responses to the universe and especially to the very activity of science. A scientist knows, for example, that objectivity and accuracy are among the basic characteristics of science and scientists, and hence, along this awareness, not only holds objectivity and accuracy dear, but upholds them in his/her actions as well. One of the areas in which one's scientistic attitude manifests itself is one's writings. Master's theses are the most significant writings that graduate students engage in. Considering the time and energy put in these final research reports, they do truly mirror their authors' scientistic attitude, as they are indicative of their authors' knowledge of, devotion to, and practice in research.

The term scientistic attitude has been taken to mean different things by Iranian authors (Hameedy, 2004). *Kaardaan* (1997), for instance, uses the term "scientific insight" instead to mean "the psychological state and cognitive activities of those who are knowledgeable, or better said, those who are researchers" (p. 15). This

"psychological state", according to him, "leads to behaviors that indicate the desire to understand the truth, to advance the human knowledge, and to serve the humanity" (Ibid). Perhaps what is meant by "the psychological state" are the cognitive and affective dimensions of a person being manifested in his/her behavior, but the truth is that the word insight does not imply such multidimensionality! May be emphasizing the cognitive dimension in "scientific insight" and overlooking the affective and behavioral dimensions stem from the belief that cognitions lie beneath all affections and actions. Even so, if one wants to be inclusive of all three dimensions, the word "attitude" is, by definition, the most expressive and inclusive. The main characteristic of any attitude is that it is learned. As such, the development of scientistic attitude can be viewed as one of the fundamental goals in higher education. *Ormrod* (2000) suggests that all curricula should include activities that help with the development of scientistic attitude. *Feuer*, *Towne*, and *Shavelson* (2002) suggests many such activities that they consider being among the hallmarks of scientific culture.

One of the indicators of the scientistic attitude/scientific culture is evaluation of the processes and products in higher education. *Leathwood* and *Phillips* (2000) report that evaluation in British higher education has increased due to the increased emphasis on accountability, on the one hand, and the spread of research and teacher training programs, on the other. *Rattcliff* (1996) while emphasizing that student outcome should be the very basis of any evaluation in higher education refers to the ranking of the American and Canadian colleges and universities based on such evaluations. That is where the political dimension of evaluation becomes evident. *Henkel* (1998) reminds us that in the light of the changes in philosophical foundations of science, the very concept of evaluation has also changed to include not only process instead of product orientation, but also to reveal the political nature of evaluation. *Pratt* (1997), suggests that the evaluation of higher education should focus on planning, implementing, and outcome phases as the evaluation of any one phase, without the others, cannot lead to genuine improvement. Such a multidimensional approach to educational programs is indicative of a scientistic attitude.

Educational outcomes in Iran are not evaluated in a way that they should have been evaluated. That is perhaps because those who are involved in education, to quote *Baazargaan* (1998), "resist evaluation for a variety of reasons" (p. 131). While the political nature of evaluation could have some thing to do with this resistance, it can also be indicative of a weak scientistic attitude in these decision makers. There are other sets of evidence in this arena (e.g. Shokoohee, 1997; Hameedy, 1999; Meerlohee, 2001). Obviously planners and implementers deprived of a scientistic attitude would not and could not include its development in their programs, and as a result, their audience (students) would be deprived of the opportunities to develop such an attitude.

*Volkmann* and *Eichinger* (1999) refers to scientistic attitude as "scientific literacy" which includes habits like thinking and reasoning that can be learned by students if the curriculum aims at them. *Glynn* and *Muth* (1994) also considers having a curriculum that emphasizes on reading and writing as the basic step toward students acquisition of scientific literacy. *Feuer*, *Towne*, and *Shavelson* (2002) who regards scientistic attitude at the communal level and call it scientific culture, point

out that its development is comprised of creation of habits like multidimensional, objective, and accurate observation, systematic, creative, and free thinking, unbiased, constructive, and compassionate criticism, and strong commitment to evidence. Among the agents that bring about such habits or attitude, *Papanastasiou* (2002) speaking of the curriculum planning and the act of teaching, points out that if in these endeavors not enough attention is paid to the development of scientistic attitude, unpleasant and negative consequences, including a drop in achievement, would follow.

*Booh* and *Toh* (1998) reports on the senior year college students' ability to reason scientifically. Most students in the study engaged in perceptual reasoning rather than scientific reasoning, as they avoided using scientific concepts in their arguments. In other words, four years of university education did not prepare the students to reason scientifically. *Hameedy* (2004) also reports no difference between the attitudes of the first and fourth year undergraduate students in terms of being scientistic. However, Wilson (in Papanastasiou, 2002) reports that academic success brings about positive attitude towards education and science. Of course, attitude towards science should not be confused with scientistic attitude. Any one having a scientistic attitude, surely, has a positive attitude towards science, but those with positive attitude toward science do not necessarily have a scientistic attitude. Nevertheless, such findings, despite some shortcomings, demonstrate the connection between students' attitudes and university products such as Master's theses, and hence justify the evaluation of the latter as a way of assessing the former.

Theses have been studied before, but not evaluated as a measure of the scientistic attitude of the graduates, or as an index of their progress in science across time. *Coorough* and *Nelson* (1997; 1991), for instance, have studied the theses abstracts in order to describe the topics, types, methods, etc. of the theses written. *Grady* and *O'Connell* (1993) looks at the dissertations across a 30-year time span dealing only with a specific topic. *Saadeghee* (2001), like many other thesis researchers in Iran, has focused on theses written in a period of time in a specific area, describing their topics, data sources, instrumentations, and data analysis methods, however, occasionally has dealt with the quality of the theses reviewed and has found it inadequate.

## METHODS

**The data collection design** in this research consisted of five sets of theses, which were evaluated twice. The evaluation took place in 88 separate evaluation sessions, all taking place at the main library. The time of the sessions was randomly scattered throughout the data-gathering period.

**The data sources** were 44 theses in five different areas of study completed at two points in time in an all-girl Iranian institute for higher education. The institute, despite being non-coed, was deemed similar to other universities as the curricula for different areas of study are identical in all Iranian universities and the methods used there within are pretty much the same. However, the selected institute being an all-girl school did create the expectation that the quality of the educational products would be high and improvement across time noticeable. This expectation seems

reasonable since this institute is the only women's university in Iran and also because of its stated goals as mentioned by *Rahnavard* (2003). To select the theses, initially five colleges with master's programs were selected from among the seven colleges existing at the institute. Then from among the major areas of study at each college one or two were chosen randomly. The reason for the inconsistency in the number of major areas was the number of graduates and that of theses written.

**The instrument** used in this research was the Scientific Quality Scale, specially constructed to measure scientific quality of the theses. The measure (SciQua Scale) included 17 items on three dimensions of the reports (theoretical, methodological, and structural). The initial evaluation of the instrument yielded an internal consistency of 0.75 and a high inter-rater correlation (0.94). The collected data were assumed to be interval data in order to pave the way for the use of the selected method of data analysis.

**The data analysis method** was a two-way ANOVA, since there were two sets of theses across five major areas/colleges. Using this method of analysis made it possible, not only to describe the two sets of theses in terms of their scientific quality across the five fields of study, but also to infer any differences between major areas and among the two factors.

## FINDINGS AND IMPLICATIONS

The results (**Table 1**) were consistent with the evidence gathered in other studies and reviewed above. There was no difference between major areas of study (**Table 2**), with the arts major being an exception since the SciQua Scores for these theses were significantly lower than those in the other areas of study ($p < 0.001$).

**Table 1. The Means and Standard Deviations of the Obtained Scores across Time**

| | | Literature and Languages | Basic Sciences | Social Studies | Arts | Psychology and Education |
|---|---|---|---|---|---|---|
| Time one | N | 5 | 4 | 5 | 3 | 5 |
| | Mean | 53.2 | 40.37 | 32.10 | 8.66 | 45.10 |
| | SD | 11.45 | 4.58 | 7.04 | 2.84 | 8.15 |
| Time two | N | 5 | 4 | 5 | 3 | 5 |
| | Mean | 51.60 | 48.87 | 48.50 | 20.16 | 56.50 |
| | SD | 13.48 | 1.10 | 14.45 | 19.10 | 2.76 |

**Table 2. Analysis of Variance of the Obtained Scores Excluding Arts Major**

| Source of Variation | Variation | Degrees of Freedom | Variance | Fisher's *F* | *p* Values |
|---|---|---|---|---|---|
| Year | 358.87 | 1 | 358.87 | 4.06 | 0.53 |
| Major | 884.34 | 3 | 294.78 | 3.33 | 0.32 |
| Interaction | 597.01 | 3 | 199.00 | 2.25 | 0.10 |
| Error | 2650.27 | 30 | 88.34 | | |
| Total | 92864.50 | 38 | | | |

The significance of these results lie in the fact that all scores were low (less than half of the total possible score!) across all major areas, indicating low quality

products. The scores of the two sets of theses across time were not different either; hence there was no evidence of progress in the scientific quality of the university products. These products are indicative of all three dimensions of their authors' scientistic attitude, as they not only show the research knowledge of their producers, but their research related affects and behaviors as well. Although some criticism can be leveled against the methods and instrument used in this study, the findings are of tremendous educational/scientific significance, as they imply the need for further evaluations of other aspects of the educational process such as methods and materials used and human resources employed. The study is also significant, both educationally and scientifically, in that it underlines the need for the development of a scientific culture wherein the habits mentioned by *Feuer*, *Towne*, and *Shavelson* (2002) are fostered, and activities such as criterion-based thesis evaluation and evaluation research are valued and engaged in by the university community.

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