Scientistic Attitude: The link between researchers, policy makers, and practitioners within the Iranian cultural context

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Abstract: In order for the policy makers and practitioners, in any field, to base their policies and practices on research findings, they must have developed a scientistic attitude. It is the attitude that determines and maintains the quality and direction of any action, as it is a multidimensional characteristic. Attitude is multidimensional because it refers to a person's affective, behavioral, and cognitive reactions to any phenomenon. But attitudes are also changeable because they are considered to be previously learned reactions. A scientist has learned to act and react in a particular way to phenomena around her/him, especially those related to her/his field of study. Recognition and appreciation, as well as the general internalization and use of these particularities by both the policy makers and practitioners are necessary if their decisions and actions are to be research based. This is tantamount to developing a scientistic attitude! The policy makers and practitioners in Iran are not exempt from this basic requirement. However, one reason that they may not base their decisions and actions on domestic research findings is that, in a way, they question whether the attitude of those doing the research is scientistic. Of course this very question could stem from a non-scientistic attitude toward research! Therefore, it would be appropriate not only to pose the question in regard to all three sides of the problem, but also scrutinize the cultural context within which they work. Scientistic attitude among members of any group would lead to a scientific culture within that group and vise versa. A number of studies conducted on researchers and practitioners support the notion that the attitudes are not that strongly scientistic. The policy makers can not be that different as they are also within the same cultural context. Hence, the cultural context needs to be scrutinized and changed where possible.
Keywords: scientistic, attitude, multidimensional

Theoretical Framework

Individual researchers, policy makers, and practitioners in any field have their own **attitudes**, but if their collection is considered a group or community it would have a **culture**. Attitude and culture are the two sides of the same coin: the coin of the cognaffective behaviors which has an individual and a group side. It is assumed that all behaviors have a cognitive and affective (hence, cognaffective!) basis and each individual having, in addition to his/her physical dimension, three cognitive, affective, and behavioral dimensions. Therefore, any group of individuals would have a set of collective cognitive, affective, and behavioral characteristics that can be called its **culture**, just as the learned predispositions in these three areas have been called **attitude** (Weitten, 2002) at the individual level. Hence, the correspondence between the two is obvious, although it wouldn't be a one-to-one

correspondence! Both attitudes and cultures are constructed psychosocially with the role of the individual being primary in the construction process. The dialectics of the individual and the group are the basis of development from the dialectical constructivist perspective.

Dialectical constructivism, according to Woolfolk (2001, 1998), is exemplified by Vygotsky's theory of cognitive development wherein the internalization and use of cultural tools by the individual and through his/her prior experience, beliefs, and knowledge lead to better adaptation. However, this can be said of all types of development, and indeed of the human evolution in general. That is to say that the development of cultures in general and scientific culture in particular, similar to the development of attitudes in general and **scientistic attitude** in particular, is a matter of transaction (Meacham, 1979; Hameedy, 2005a), rather than interaction, between the individual and the group. The individual helps with the development of the group, while the group helps with the development of the individual. Nevertheless, if any intervention in this process were intended it would have to be channeled through the individuals in order to introduce any changes at the group (community) level. Only if the attitudes of the individuals within a group are scientistic, one can assume that the group has a **scientific culture**. If the researchers, policy makers, and the practitioners are to be considered as members of the same community, then what could strengthen their link would be their attitudes, provided that these are scientistic, i.e. similar to the attitude of a "scientist". With such an attitude, it could be said that researchers, policy makers, and the practitioners together bring about a scientific community that has its own scientific culture.

Feuer, Towne, & Shavelson (2002) define scientific culture as a set of norms, tasks, and values such as honesty, openness, and continuous reflection on many things including the way of evaluating the quality of conducted research, and call for its promotion. In these authors opinion all fields of science, including the science of education (educational research) have similar epistemological principles: They all deal with problems that are significant and can be empirically studied; base their research on theories; use methods that facilitate direct study of the questions; utilize a clear and cohesive chain of reasoning; come up with replicable findings; and they all publish new findings in order to be scrutinized and improved. These principles are more like behavioral norms expressing what is expected from a scientist. Once these norms are internalized, used, and monitored by every member of a community then that community could be considered as having a scientific culture. The norms set by the community pave the way for each new member to put his/her work to the challenge of being critically evaluated and possibly reformulated. According to Feuer, Towne, & Shavelson (2002) the development of scientific culture 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. Needless to say, habits are formed at the individual level, and considering the cognitive, affective, and behavioral nature of habits mentioned, what the authors seem to be referring to

as the prerequisite of the development of a scientific culture is the development of a special type of attitude i.e. scientistic attitude!

Theories on attitude development and change are based on the assumption that the cognitive dimension (beliefs) is the base upon which the affective and behavioral dimensions are built and any changes in emotional reactions requires a change in beliefs and cognitions (Shrigley, 1990). However, most of the studies have reduced attitude down to its affective dimension. For example, Papanastazio (2002) considers attitude as one's affective tendency to react to things, people, places, events, or ideas; a reaction that can be either positive or negative expressed in statements like "I like science." "I find science pleasant." or "science is boring." are taken to be signs of positive and negative attitude toward science. On the other hand, some of the studies have focused on the cognitive-behavioral dimensions of attitude (e.g. Volkmann & Eichinger, 1999; Boo & Toh, 1998) at the expense of the affective dimension. Volkmann & 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 & Muth (1994) also consider having a curriculum that emphasizes on reading and writing as the basic step toward students acquisition of scientific literacy. It is rare that a study considers all three dimensions together even though the development of positive attitude toward science is considered valuable (Freedman, 1997; Colette & Chiappetta, 1998) and overlooking any one of the three dimensions is not justifiable, especially since attempts at the identification of new ways for improving students' attitude toward science (Papanastazio, 2002) require a well rounded and clear understanding of the basic concept of attitude. It should be pointed out that having a positive attitude toward science is not the same as having a scientistic attitude, although the latter is inclusive of the former. Scientists, most definitely, have a positive attitude toward science, but more over they **know** science, **love** science, and **do** science! Any one else can have a scientistic attitude, i.e. an attitude similar to that of a scientist, not toward science alone but toward all phenomena. However, to be a member of a scientific community, or to bring about such a community, having a scientistic attitude is a must.

Iranian Context

The Iranian culture is said to have valued knowing and knowledge throughout its long history wherein the Iranian civilization has gone through different periods in which the emphasis on knowledge and ways of its acquisition has differed markedly (Hameedy, 1999a): **The ancient Iranians** of pre-seventh century, according to Will Durant, considered knowledge as a commodity that could be imported from abroad just like any other good! The **Islamicized Iranians** (8^{th} through 18^{th} centuries) who perceived their new religion as compatible with their old beliefs on knowledge and its acquisition, became among the vanguards of philosophy, astronomy, mathematics, and chemistry. Especially, during the European dark ages when superstition reigned the west, the Moslems, and among them

Iranians, upheld the torch of knowledge and carried it to new heights. The number of schools and scholars increased and reached its peak during the 12th century. However, with the rise of European scholars of the post renaissance, and the pre-occupation of Iranians with their warring neighbors, the scholarly activities hit bottom and the socio-cultural environment became more conducive to superstition, ethnic supremacy, and religious authoritarianism. These social conditions eventually paved the way for a new era in which importing knowledge and its apparatus re-emerged.

The **Westernization period**, starting from the 19th century, witnessed the familiarization of Iranians with western countries cultures through the European advisors and teachers who were brought to Iran, and the Iranian students who were sent abroad. New schools modeled after European schools were founded. However, these schools, unlike their European models which had their roots in the religious schools of the middle ages, had no resemblance to the schools that had sprung around Iran during the previous period. As such, the first Iranian university was established. Unlike the old schools, the new ones, as well as the university were both not only imported and run by the government, but were also mostly used to train civil servants. As a result, what was dominant at these institutions of education was beaurocratic rather than a scientific culture. As such they were alien to both the native and the European traditions of learning/acquiring knowledge. This alienation contributed to the overall dissatisfaction with the imperial monarchy and brought about the revolutionary period.

The revolutionary period has been marked with a re-eslamization trend which has been more of a tendency toward self reliance in domestication of "science" rather than a trend toward turning the universities into religious schools or seminaries. In fact, the number of universities and research centers has increased significantly during the past two decades. Close to 0.52 % of the GNP was dedicated to research in 2004 which is the highest ever (Jalaalaabaadee & Taaheree, 2004). However, despite the quantitative expansion in universities and research centers, the quality of the works undertaken does not seem to have improved enough to pave the way for self-reliance and independence from the west, not that total independence is possible or desirable. One sign of this failure is reflected in today's language used by the Iranian "scientific" community. Most Iranians who work in scientific fields pepper their Farsi conversations and writings with mispronounced and misspelled English words while justifying their action by calling these borrowed and badly used words as "scientific terms". Had they internalized and claimed ownership of the ordinary English lexicon, leave alone the scientific concepts, they would be expressing them in their native language. Durant's notion of importation seems to be still at work, and perhaps at an even larger scale!

Linguistic importation has started ever since the second period in the history of Iranian culture. The word used for science (*elm*) is an imported word from that period meaning knowledge, and hence, overlooking the sense of activity imbedded in the word science. One of the words used for research (*tahgheegh*) is also from this same period and means seeking the righteous (truth). Both words carry a religious overtone as the former refers to the knowledge of "the all mighty" and the latter to his pursuit as the ultimate truth! The corresponding genuine Farsi words (*daanesh* and *pejoohesh*), though lacking these overtones as well as the necessary precision, are not used as extensively and with the same meaning as the imported ones. Given the conventionality and flexibility of languages, it could be argued that new meanings can be attributed to old words just as the 14th century word science (meaning the state of knowing) has come to currently mean the systematic pursuit of knowledge, or the work done by a scientist. However the 7th century Arabic word "*elm*" has not gone through such a semantic transformation and in contemporary Iran is considered to be as separate from research as that is from technology. This perceived separation is clearly expressed in the new name for the Iranian ministry responsible for higher education: Ministry of Science(s), Research(es), and Technology!! Such linguistic evidence not only supports Durant's notion of importation but also shows that naturally some of the hidden aspects of what is imported are lost in the process, rendering them imprecise and inaccurate. The same is true of the word and concept of attitude.

The word attitude has been translated to Farsi (*negaresh, beenesh*) but has lost part of its meaning in the process. Using words like "insight", "world perspective", or "point of view" instead of "attitude" shows that the uni-dimensionality of these concepts or the multidimensionality of "attitude" is overlooked. Shokoohee (1997) considers "scientific insight" as just "another type of knowledge" which stands counter to "intuitive insight" and "emphasizes not only on seeing, but also on looking" (p.135). Ghaasemee Pooyaa (1997) uses the word insight to mean "the way that one looks at the world" or "world perspective", and considers scientific insight as "looking at the world through different types of knowledge" (p.26). What he means by "different types of knowledge" is "religious, intuitive, artistic, rational, philosophical, and scientific knowledge" (Ibid.). However, Kaardaan (1997) views "scientific insight" as "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 Kaardaan (1997) has 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" (*baazkhord*) is, by definition, the most expressive and

inclusive. Yet the fact that this word (*baazkhord*) is rarely used to mean attitude and instead is carelessly used to mean "feedback" (confusing eating with feeding!), along with the other facts from the Iranian cultural context mentioned above, it would be reasonable to question whether the theorized link between the educational researchers, policy makers, and the practitioners in Iran exists or not. That is to say whether or not these groups have a scientistic attitude to form a scientific community and have a scientific culture.

Research Findings

A number of studies have been conducted that show the attitude among different subgroups/individual members of what could constitute Iranian scientific community is not scientistic enough. As a result the non-existence of a scientific culture among researchers, policy makers, and practitioners is considered as the main reason for the lack of utilization of research findings (Mehrmohammadi, 2000; Naami, 1998), while in a sense, the absence of scientistic attitude is considered to be one other culprit (Safe, 1998). However, some of these authors seem to have simply assumed that research findings are not utilized and hence, have proceeded to explain why it is so without giving any evidence to substantiate the existence of such a problem. This in itself could be considered as a consequence of not having a strong scientistic attitude. A much closer scrutiny of some of the other writings in Iranian "scientific" journals (Hameedy, 2000; 2001) has lead to the same conclusion: Ignoring principles of scientific writing, as well as linguistic rules, is a clear indication of non-scientistic attitude toward writing. In another survey (Hameedy, 1997) a sample of research administrators responsible for the promotion of educational research at the provincial level expressed their understanding of "science" and the "scientific method" in writing. The data again show that there is much to be learned by these administrators if they are to succeed at the task of promoting educational research. In response to a national call for research proposals, a total number of 66 proposals were received and then content analyzed for reflecting their authors' scientistic attitude (Hameedy, 1999b). The results show that half of the proposals were out right unacceptable, with the other half being "repairable"! Meaning that the majority, if not all, of the authors lacked the knowledge and the affect necessary for the act of writing an acceptable research proposal. Similar findings were obtained when research reports and master's theses were content analyzed.

The research process produces a tangible product, namely the final report. In evaluating the scientific quality of a sample of research reports from among all such documents submitted to the national Iranian Center for Educational Research in one year, Moraadi (1996) reports an average score of 57 out of 100, or below the barely acceptable benchmark of 60. The most outstanding shortcomings were the absence of a theoretical framework, critical review of the literature, and clarity in methods of data collection, appropriate data analysis methods, and meaningful interpretation of the results. Furthermore, the writing style in all reviewed reports exhibited a myriad of non-scientific characteristics (Hameedy, 1998). A

review of the evaluation process of the same reports revealed that the evaluators, as well as the evaluation instrument, lacked the precision and accuracy necessary for the results being valid and reliable (Ibid.). In a more recent evaluation of master's theses across different fields of study and times, Hameedy (2005b) reports that scores did not show high quality theses and no positive change over time. There was no difference between major areas of study, with the arts major being an exception as the scores of theses in arts were significantly lower than those in the other areas of study ($p<0.001$). 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 and poor scientistic attitudes of students and their professors. The attitudes of both newly admitted and soon-to-graduate university students were also measured directly in terms of being scientistic (Hameedy, 2005c) by using a three-dimensional scale. Results again show a rather poor scientistic attitude constant across the four years of undergraduate experience. Based on these findings it was hypothesized that perhaps the university professors lack a strong enough scientistic attitude in order to promote such an attitude among their students.

To test this hypothesis, Hameedy (in print) has evaluated a sample of 74 sets of responses given by as many university teachers in terms of their scientific content and linguistic structure. The sample was chosen randomly from among the responses of all teachers in 11 universities who had participated in a series of retraining workshops. The faculty members whose responses were evaluated were from diverse colleges and fields who had volunteered to participate in the workshops. The responses were evaluated by two evaluators who were especially trained in order to maximize the inter-rater reliability. The data analysis has revealed that all participants had low scientific and linguistic knowledge and skills with no significant difference between different universities. However there was a significant difference between the two areas of scientific and linguistic knowledge, with the former being lower than the latter: on the average the respondents gained only15% of the possible score on the scientific characteristics of the responses while the average score on the linguistic characteristics was 40% of the total possible points. The responses of the faculty members show that most of them are not familiar with the significance and timing of different types of scientific writings. None of them has mentioned the writing of a research proposal among scientific writings! There was also no referencing in all of the given responses, and only 4% of them contained any sort of reasoning. With such findings, the previous results obtained from the students become rather justifiable since to promote scientistic attitude, teachers need to have an outstanding scientistic attitude themselves. Of course the findings of the above reviewed studies themselves need to be evaluated.

It could be said that the findings of the reviewed studies lack adequate external validity, as the sampling in all cases has been less than representative of the whole Iranian "scientific" community (population) or any segment there of, but then there has been no intent of

generalizing from the observed samples to the said population or any of its segments, and none has been attempted. Having a population of researchers, practitioners, policy makers, administrators, leaders, and beneficiaries (students) in education, any and all of its segments that are studied give information on the status of that segment, no matter how small the studied segment is. What is important is that the collection of these segments and the information gathered on their status give a clear picture of the studied phenomenon: the scientistic attitude of researchers, practitioners (teachers), administrators, and students. In other words, the internal validity of the studies reviewed has been reassuring enough that one could rely on the findings. That is because the instruments used in the studies, as well as the way they have been used to collect the data with adequate control, have been valid and reliable as reported by the authors. This paves the way for a discussion of the general finding and its implications.

Discussion and Implications

If researchers, policy makers, and practitioners in education are considered to be a community with a special set of knowledge, values, and practices (i.e. a culture), individual members in any of these subgroups, and in the entire community, need to have a set of beliefs, values, and behaviors that connect them together. This shared set of cognitive, affective, and behavioral characteristics, or predispositions to respond to events, is nothing but that which we have called attitude, and scientistic attitude to be precise, given the nature of the shared activity of the community, i.e. science. Having a scientistic attitude, that is an attitude like that of a scientist, the communication and professional link between these subgroups becomes possible. This would lead, on the one hand, to research by the researchers on problems that the policy makers and practitioners in education are faced with, and on the other, to utilization of research findings by these very subgroups. However, even if every member of these subgroups had a scientistic attitude, to reach the lofty goal of research based practice and decision making in education, and the other fields, there must be a scientific culture, i.e. collective definition, recognition, and appreciation of scientistic attitude. In other words, the individual and group dimensions need to be in transaction. The very tool of this transaction is nothing but the native language of the community upgraded to meet the demands of a scientific exchange in terms of clarity, precision, and accuracy in communication. It was from such a perspective that the data on the Iranian educational community was reviewed and concluded that the scientistic attitude in this grouping is not strong enough to have brought about a scientific culture, just as the dominating culture is not strongly enough scientific to help with the development of scientistic attitude at the individual level. The history and the contemporary language also mirror this conclusion.

The historical periods outlined above, though different in appearance, have a rather clear trace of what William James Durant has said about the ancient period. If it has been true of the ancient Iranians that they preferred importing knowledge, like other commodities they did not produce themselves, from Babylonia (some place to the west of Iran), then the same could be said of the other periods as well, albeit with one difference that Babylonia has no longer been in existence! The imported knowledge seems to have always come from the west. Babylonia, Hellenia (Greece), Arabia, Europe, and America have been /are all to the west of Iran! Along with these imports have come words, and at the second period an entire language, with which the new imported knowledge has been expressed. Many Iranian scholars of the Islamicization period, like Ebni Seenaa, Faaraabee, and Beeroonee have written their main works in Arabic. During the Westernization period, it was first French and then English language that became synonymous with the knowledge imported from Western Europe and America. During the contemporary period, despite talks of self reliance, the importation of new Arabic words along with the avalanche of English words continues while attempts at Iranization of the lexicon are met with resistance. If the justification for using English words while speaking/writing in Farsi is that they are “scientific expressions”, then it implies that

"science" is Anglo-American, and neither Iranian nor Iranizable! To consider science as having geographic boundaries is a clear sign of non-scientistic attitude, yet at the end of Iranian journal articles one always sees two lists of references: Domestic and "foreign", just as when one goes to buy household items or auto parts, for example, is always encouraged to go for the imported item. The quality of domestic products, where they exist, is mostly considered lower than that of their foreign counterparts. Within such a cultural context, while the task of importing commodities, of all sorts, is very practical, creation of a genuine scientific subculture would not be an easy task.

To create a scientific culture, those aspects of the dominant culture that may impede such a development need to be initially recognized and then gradually removed so that the replacement of scientific substitutes would be possible. However, to do so is tantamount to changing the attitudes towards science at the public level and strengthening the scientistic attitude of those involved in "science", at the subgroup level. Addressing the public through mass media and engaging in public debates can help with the improvement of public perception of science, while the curricula in public schools at all levels could be the vehicle for shaping the attitudes of the developing generations to be more scientistic. Setting up workshops for teachers at all levels of schooling would also help with the changing of attitudes and eventually the culture. Through such debates, discussions, dialogues, and designs not only mind sets would be reconstructed to see science as an activity rather than a commodity, but hearts would also be set on genuine engagement in exploration and innovation rather than on superficial mimicking of the motions. As an activity, science has a philosophy, a history, a set of goals and objectives, as wells as special methods and instruments, all of which need to be recognized, internalized, and valued prior to any engagement in the activity itself (i.e. science)! Discussions and debates at all levels can bring about internalization, valuing, and application. However the key factor in determining the success of these debates and dialogues in creation of a scientific culture, or in promotion of scientistic attitude, is the **language** used in communicating the very knowledge and affect involved in the activity of creation.

Language is the mirror in which mind and heart can be reflected. If the thoughts and affects that one has were scientistic then the simplest activity reflecting them would be the activity of linguistic expression. On the other hand, if the form and structure used in the linguistic expressions were scientistic, it could be hoped that the thoughts and affects they represent are shaped into being scientistic. Hence, we are again faced with a dialectical transaction wherein any alteration in one dimension leads to change in the other and vise versa. Thus given a language flooded with non-native words and structures like Farsi, and a linguistic tradition of flattery, embellishment, and implicitness like that of the Iranians, it is paramount that non-native words are replaced with genuine Farsi words and, in the context of scientific works, the linguistic tradition is changed to explicitness, simplicity, and straight

forwardness if the linguistic expression is to become scientistic. Special reading and writing courses on science, as well as debates and discussions on the same topic could lead to improvement in this area and eventually to improvements in thoughts and affects. Once the language is improved and thoughts and affects have become scientistic at the individual and subgroup levels we can expect the link between researchers, policy makers, and practitioners to be strengthened and a community with a scientific culture formed.

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