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Integration: An Appropriate Approach for Nurturing Rationality (Iranian Curriculum Experts and Teacher's Point of View)

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Abstract: The main purpose of this study is to suggest an appropriate approach for including rationality in school curriculum from Iranian curriculum experts and teacher's point of view. The research method is descriptive analytical. Qualitative and quantitative methods have been used in order to carry out the research. The statistical sampling in the qualitative section consisted of all Iranian curriculum experts, out of whom 11 were selected using goal-oriented sampling. The quantitative statistical sampling comprised of 352 elementary school teachers whom were selected using cluster sampling. The research data were collected from semi-structured interview and researcher-made questionnaire. In order to determine the validity, content validity and to check the structural validity, operating analysis and to estimate the reliability of the questionnaires, Cranach's alpha coefficient (0.87) was used. It is worth mentioning that the findings reveal that the results obtained in the quantitative part are in agreement with those obtained in the qualitative. Results of Chi-square analyses showed participants did not agree with offering separate subjects for nurturing rationality. The majority of them agreed with integrating rationality in curriculum. Additionally, they proposed integration based on procedures, concepts and issues related to rationality and integration through procedures, subjects, issues and concepts related to rationality as the basis for organizing the communication between subjects.

Key words: Integration, curriculum, rationality, education, communication, organizing

INTRODUCTION

In the philosophy of education, cultivation of reason and rationality has been similarly esteemed as a central educational aim or ideal. Historically, philosophers of education whose positions otherwise diverge dramatically have consistently articulated, endorsed and defended educational visions to which the cultivation of reason or the fostering of rationality has been central. Socrates, plato, decarts, lock, hume, kant, mill and other grate figuers of the modern and elightment period venerated rationality and prised it as an educational aim, the realization of which would enable humans to achive the air full potentioal as rational bing. More recently, Bertrand Russel extolled the virtues of and education in service of cultivation of reason. A number of theorists also have argued that education core purpose should be the promotion of rationality (Moshman, 1994; Stanovich and West, 2000).

Nozick (1993) posited that it is the capacity to be rational that differentiates humankind from other animals and that rationality is a crucial component of self-image. Rationality is the characteristic of human big that makes their thinking and thoughts consistent and reliable, particularly in making inferences, judgments and decisions (Stanovich and West, 2000). In fact, the concept of rationality encompasses the concepts of rational thought in the philosophical and cognitive science literature that bear closest affinities to practical intelligence and wisdom (Nozick, 1993; Sloman, 1999). Rationality is defined as the self-reflective, intentional and appropriate coordination and use of genuine reasons in generating and justifying beliefs and behavior.

Sternberg (2004) defined four possible scenarios for the future of education in the United States. One scenario will produce graduates who have learned facts and accumulated knowledge but who have no critical thinking skills. Another scenario will produce graduates who are good critical thinkers and another will produce intelligent thinkers. He suggested yet one more scenario for a future with graduates who are wise thinkers.

According to Sternberg (2004), students who have learned facts and accumulated knowledge by recitation and repetition can be referred to as "walking encyclopedias". An excellent analogy he offered is that of memorizing a German-English dictionary. A person

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who does this can translate many words, yet this person still does not know the language. Besides producing graduates who are not critical thinkers an important commodity in this fast-paced world this type of education also cannot produce graduates who are wise. A system that produces critical thinkers will produce good problem solvers. However, what is lacking in this scenario is the fact that these graduates will not use creativity in their problem solving skills that can mold and affect the environment in their chosen field of endeavor. Graduates of an educational system that produces intelligent thinkers will possess creative, analytical and practical abilities that will generate new ideas. These graduates are those who learn to think outside the box when problem solving. However, graduates from a system that teaches wisdom in addition to knowledge, critical thinking and intelligent thinking will differ in one important aspect. The resulting creativity and out-of-the-box problem-solving skills willbe used for the common good, rather than for the gain of self or private interest groups.

Philosophically, rationality is a justifiable goal of education not only because it is a means to worthwhile ends but because it is an important end in itself and because it can be promoted via non-indoctrinate means. We must developa plan to promote rationality in schools and consider its relation toother educational goals. To consider the place of rationality in the curriculum, any approach to education that suggests goals beyond the teaching of content must consider where in the curriculum those goals are to be achieved. To put the matter in dichotomous terms, should activities aimed at achieving these goals be infused throughout the curriculum (e.g., included in existing content-specific courses) or should the new activities be integrated and accomplished as a package (e.g., in a specific new course on thinking or rationality) (Moshman, 2004). So, the research question is: which is appropriate approach for nurturing rationality at school (separate subject or integrated curriculum).

Integrated curriculum: The traditional approach of educating students was through separate or single subject curriculum where subjects were divided into distinct discipline areas with the content as the focal point for the development of the curriculum. The idea behind separate subject curriculum is that each content area has a unique knowledge base, procedural skills and attitudes and values. With this approach, subjects are taught as unique entities which theoretically enables students to gain the knowledge, skills and attitudes of each discipline in the most effective way possible (DeHart and Cook, 1997).

Integrating the curriculum is an incredibly important issue in the field of education. As mentioned by Campbell and Henning (2010) knowledge today is becoming more interdisciplinary and integrated which calls for more interdisciplinary and integrated learning in public schools. Teachers are continually looking for ways to engage their students and deepen their understanding of the content. Integrating the curriculum is one way to accomplish.

This view finds its basis in the research of Piaget, Dewey, Bruner and others who hold a holistic view of learning. Each of these theorists is concerned with children having an understanding of concepts and underlying structures. Proponents of the progressive education movement of the 1930's advocated an integrated curriculum, sometimes identified as the "core curriculum" (Vars, 1987).

Integrated curriculum refers to the materials and pedagogical strategies used by "multidisciplinary" teams of teachers to organize their instruction so that students are encouraged to make meaningful connections across subject areas. English, mathematics, science, social studies, arts, world language, physical education and career technical teachers can all collaborate to plan and present related lessons that center around a central, career-themed issue or problem. Beane (1997) contended that an integrated curriculum "is concerned with enhancing the possibilities for personal and social integration through the organization of curriculum around significant problems and issues, collaboratively identified by educators and young people without regard for subject-area lines".

A basic definition offered by Humphreys *et al.* (1981) states that an integrated curriculum is one in which children broadly explore knowledge in various subjects related to certain aspects of their environment. Curriculum associates, makes associations among the humanities, communication arts, natural sciences, mathematics, social studies, music and art. Skills and knowledge are developed and applied in more than one area of study. In keeping with this definition, Shoemaker defines an integrated curriculum as education that is organized insuch a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world which is interactive. Dressel's definition goes beyond the linking of subject areas to the creation of new models for understanding the world: in the integrative curriculum, the planned

Table 1: Methodologies of integration

Researchers	Methodologies of integration
Schubert	Separate subject, broad field, projects, core curriculum and integration
Jacobs (1989)	Discipline based, parallel discipline, complementary discipline units or courses, interdisciplinary courses, integrated-day model, complete program
Fogarty (1991)	Fragmented, connected, nested integration, sequence, shared, webbed, integrated model, immersed, networked
Vars (1987)	Correlation, fusion, structured core, student center or unstructured core
Case	Integration skills and processes, integration of school and self, holistic integration
Deric	Multidisciplinary, transdisciplinary/supra disciplinary/real world
Martin *et al.* (1995)	Interdisciplinary curriculum, integration around skills, integration between student's experiences, internal life or affect and the school curriculum
Hunter (1988)	Incidental, reinforcement and practice, embedding, coordination, processes, thematic or topic organization

Table 2: Chi-square analyses for including rationality in school curriculum

Parameters	χ^2	df	Sig.
Separate subjects for nurturing rationality	18.53	4	0.11
Integration based on procedures, concepts and issues related to rationality	34.29	4	0.05
Integration through procedures, subjects, issues and concepts related to rationality as the basis for organizing the communication between school subjects	26.60	4	0.03

learning experiences not only provide the learners with a unified view of commonly held knowledge (by learning the models, systems and structures of the culture) but also motivate and develop learner's power to perceive new relationships and thus to create new models, systems and structures.

In fact curriculum integration is more than merely integrating subjects. It is a philosophy that crosses traditional subject boundaries and empowers the learner (Brough, 2007) many researchers (Table 1 and 2) defined deferent methodologies of integration.

In this regard, a glance at related research works is also inspiring. For instance, Hartzler (2000) in her meta analysis of 30 studies examining the effects of integrated curriculum programs on student achievement, found overwhelming evidence to support the conclusion that students in integrated curriculum programs do better on standardized and program developed assessments of achievement than students in traditional classrooms.

Potworowski and Ferrari (2008) have also observed that an integrated curriculum that fosters wise thinking skills is motivating to students and their teachers who implement it. Ozturk and Erden (2011) results indicated that teachers have positive beliefs about an integrated curriculum in general however, teachers revealed that they tend not to integrate visual arts activities with subjects, rather they use them as a consolidation of other activities (Ferrari and Potoworowski, 2008).

Kahveci and Atalay (2015) highlighted the thoughts and experiences of gifted and talented students regarding the integrated curriculum model's implementation. The findings of the study identified positively changing student views on the differentiated social studies unit in terms of the integrated curriculum model and its instruction.

MATERIALS AND METHODS

Type of research: The present research is analytical descriptive and surveying method. Two qualitative and quantitative approaches were employed in performing thedifferent sections of this research work. Qualitative method was used to collect information from specialists in curriculum while quantitative method was employed to collect information from teachers. The findings of the qualitative section were used not only to answer the research questions but also to construct the tools for the quantitative section. Therefore, the combined exploratory method was also used in this research (Creswell and Clark, 2007).

Population and sample: The statistical population of this study is comprised of two groups: Iranian curriculum experts who compose the study population of the qualitative section and elementary school teachers who form the study population of the quantitative section.

Sampling method and the sample size: The present study initially used targeted sampling method for the selection of 11 curriculum experts (Creswell, 2004). In fact, the experts selected as the study population were "significant samples" (Williams, 2006). The size of the sample from curriculum experts was not calculated quantitatively, since very small or large samples are not recommended for qualitative studies and such criteria as data saturation and information redundancy show the adequacy of the sample (Onwuegbuzie and Nanay, 2007).

We also use cluster random sampling for the selection of 352 elementary school teachers. The sample size was calculated via different cochran's sample size formula to specify the number of elementary

teachers. Additionally, after performing the research work the test statistical power was calculated and with regard to the fact that the statistical power was equal to 1, the adequacy.

Measurement instruments: Data collection instruments were semi-structured interviews in the qualitative part and questionnaires in the quantitative part as follows.

Semi-structured interviews: This method included asking a series of structured questions and it was followed by the use of more questions toget more information and so the interviewees explained their views in detail (Hancock and Algozzine, 2006; Gall *et al*., 2002). By this method of interview all participants were asked the same questions that were predefined interms of sequence and structure. However, according to the atmosphere conditions of the interview additional questions were posed during conducting the interviews to provide wider information. Also an interview guidewas prepared that its questions were designed around the core questions.

Questionnaire: Since, there was not a standardized questionnaire about the research subject, a questionnaire was made to collect data from faculty members in the form of 12 items. To provide this instrument, the results of theinterviews were used.

Validity and reliability of instruments: In the present study, the following techniques have been used to determine the validity and reliability of methods and instruments.

Researchers interviewed the experts on their perspectives concerning the topic. As Gall *et al.* (2002) emphasized, the interview as a measurement instrument, should have the criteria of reliability and validity of other instruments. Therefore, in this study the content validity was used to determine the validity of the interview guide. Moreover, for high accuracy and reliability of data and generalizability of interview results, the method of triangulation was used (Creswell and Clark, 2007; Gray *et al*., 2007; Gall *et al*., 2002). So, questionnaires were prepared based on findings of interviews. Text of the interviews were returned to the interviewees to survey by them and were asked to make any modification or change and announce the new comments. In addition, the results of classification and analysis of the interviews was confirmed by supervisor and consultant (Gall *et al*., 2002). Content validity was used to determine the validity of questionnaires (Cohen *et al*., 2007; Sin *et al*., 2005). Therefore, questions were tried to be content represents which was going to review. To estimate the questionnaires reliability, Cronbach's alpha (0.87) was used.

RESULTS

Research findings: Since, the method of this research work is a combined approach, the findings are therefore presented based on that.

Analysis of interviews: The interviews were performed inperson and using a recorder. Then, the interviews were transcribed and typeset. Analysis of data obtained from interviews was performed with thematic content analysis (Creswell, 2004; Gall *et al*., 2002). According to this method of data collection from interviews, the text of interviews were written and then all the sentences in interviews with the same meaning were put together and a code or name was considered for them in accordance with the embodied concepts in them. After reviewing it, same codes came together and formed the larger categories. Eventually, the interviews were analyzed by the final categorization.

One of the major categories extracted from content of the documents and interviews is that rationality is a meta subjective concept, i.e., foster ingrationality is beyond the realm of a single subject in the field of curriculum. According to one expert: "development of rationality is an interdisciplinary issue and all subject should have it in their content". Another interviewee said that: "cultivation of rationality occurs in whole school experience. Rationality development could be the result of several activities and experiences even in the extracurricular activities outside class environment and cultivation of rationality has to be the overall outcome of all school experiences not a mere subject's task".

According to another expert, "cultivation of rationality is not limited to a single specific school subject and should be considered in all learning opportunities for different subjects".

In some cases, interviewees believed that even if a new subject is compiled for cultivation of rationality, this new subject will have the fate of other subjects and will be limited to memorizing, repeating and finally being forgotten. According to one expert: "the cultivation of rationality could not be offered as an independent school subject in the educational system; yet it covers a vast area in which all subjects and even extra curricular activities are involved". Another interviewee believed that "one specific subject is not able to nurturing

rationality. Disciplining approaches do not have the capacity for reaching these goals". Finally according to the interview respondents 2 different integration identified as the most important method for including rationality in curriculum: First, integration based on procedures, concepts and issues related to rationality. Second, integration through procedures, subjects, issues and concepts related to rationality as the basis for organizing the communication between school subjects.

Analysis of questionnaire: In the quantitative part of the study, using the data collected from qualitative section of the study, a 12 item questionnaire was designed and given to teachers and education experts. A closer look at descriptive data reveals that 87% of teachers and experts agree with integration through procedures and concepts related to rationality and 69% of them agreed with integration based on procedures and concepts related to rationality. Finally, only 18% of the teachers and experts agreed with offering new subjects to train rationality in children.

Results of Chi-square analyses are summarized in Table 1 also showed that the majority of participants agreed with integrating rationality education in curriculum. Additionally, they strongly agreed with integration based on procedures, concepts and issues related to rationality (χ^2 = 34.29, p<0.5) and integration through procedures, subjects, issues and concepts related to rationality as the basis for organizing the communication between school subjects (χ^2 = 26.06, p<0.05). Participants did not agree with offering separate subjects for cultivation of rationalityat school (χ^2 = 18.53, p>0.05).

DISCUSSION

The findings of study show that the separate subject curriculum is inadequate in responding the needs and realizing the goals of rationality development therefore, integration seems to be of much more chelp to reach such goals. It could be said, Iranian curriculum experts and teachers believe that the best method for nurturing rationality is integration method and all of them have emphasized on necessity of that. They propose two integration method.

Integration based on procedures, themes and issues related to rationality: According to this model, components of rationality development are selected as a significant and rich concept and other subjects are around

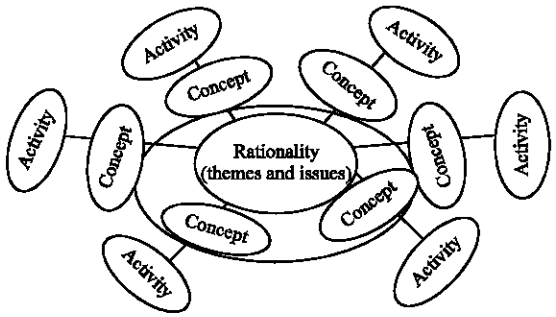

Fig. 1: Integration based on procedures, themes and issues related to rationality

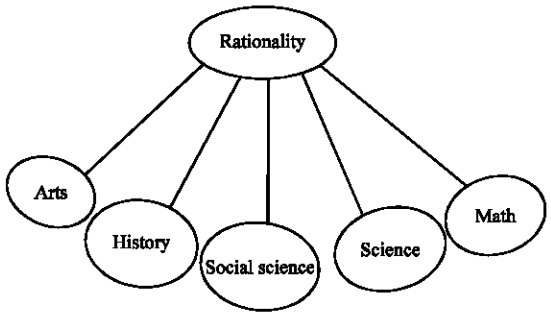

Fig. 2: Integration through issues and concepts related to rationality as the basis for organizing school subjects

it (Fig. 1). This method of integration based on procedures, concepts and issues were proposed also by Hunter (1988), Fogarty (1991) and Jacobs (1989). In this integration, one independent subject is formed using practical units related to rationality. In this model, development of rationality occurs in a specific time with prior preparations. The activity-oriented curriculum however is offered with prior prediction and planning. Students are constantly learning actively and conduct various activities related to the educational subject. Reasoning skills are therefore represented in a single specific package.

In fact, the very structure of thematic units enables teachers to readily challenge students thinking around themes of universal interest while presenting content in an integrated manner rather than as discretely separate subjects (i.e., theme, concept, problem). Also, believed that it energized teachers and students alike. Further, they believed that integrated curriculums "provide instruction that engages students, keeps them excited and keeps them learning".

Integration through procedures, subjects, issues and concepts related to rationality as the basis for organizing the communication between school subjects (Fig. 2). In

this model, nurturing rationality is selected as a big idea (Fogarty, 1991) or a concept capable of making joints (Jacobs, 1989) to create unity among all or parts of material in school subjects. Rationality is the concept that is not only taught independently but also could be inserted into and taught through other subjects. In this regard, teaching these concept becomes a secondary function for them. These conceptare parts of procedural capabilities and are common in their content among all subjects. For instance, fostering rationality could be followed in most subjects even though their representation and application may differ.

CONCLUSION

So, based on findings of the present study could be said that an integrated curriculum should be designed and compiled to nurture rationality. This curriculum acts as a framework to coordinate curriculum with the content designed for nurturing rationality. This finding isconsistent with those obtained by Brough (2007). Brough have outlined curriculum integration nurtures young talent in the regular classroom setting. He also believed curriculum integration provides the opportunity to make connections between ideas and involves higher order thinking strategies. Commented that integrated approaches not only allow for relevant content but also simulate the knowledge and thinking needed by professionals who research within separate disciplines. Kevin (2015) also mentioned It is important in education for students to be pushed to higher levels of thinking with important content. Critical thinking is highly emphasized in an integrated curriculum because it motivates students and teachers simultaneously.

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