The Cultural Diversity and Its Role in Mathematical Activities

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Abstract
Mathematics is subject that can abstract very fast and when loss self-relation to real life which students know out of school then is meaningless for some of them. This meaningless may be the result of cultural and ethnical changes of school. In this study, it is be tried that consider to cultural and ethnical changes and diversities of mathematics students and their how learning. Then Hormozgan province; Kish Island is be selected for cultural diversities and via semi multi-steps cluster sampling method, twenty seven teachers of mathematics and forty mathematics students at high school level are be chosen. Through questionnaire-researcher made, for the study of two hypothesis, related questions are be implemented for teachers and students. The results of study via statistics tests indicated that teachers of mathematics have not cultural diversities management regard to scientific and cooperative activities of mathematics students with cultural diversities but their students belief to this case.

Keywords: Mathematics, cultural diversity, cultural management, class management, scientific cooperation.

1 Introduction
Culture "function to improve the adaptation of members of the same culture to a particular ecology and it includes the knowledge that people need to have in order to function effectively in their social environment" [38]. The element of culture plays an important role in adult learning [3,23] and has the capacity to influence the learners' learning styles [26]. Candy (1991) said that "adults are powerfully affected by aspects of their background -including family and prior education-in ways that limit and constrain their ability to be self-directing in certain learning situations" [5]. The culture of a society is "the glue that holds its members together through a common language, dressing, food, religion, beliefs aspirations and challenges. It is a set of learned behavior patterns so deeply ingrained" that we act them out in "unconscious and involuntary" [1]. Cultural values are emotion-laden, internalized assumptions, beliefs or standards that shape how we interpret our life experiences [27]. In a collectivist society such as Malaysia [19], members of groups do not speak up, or even express a contradictory point of view, instead social harmony is maintained and it is the hidden goal of every communication [4]. This is done so as to
avoid losing face, which is a terrible thing to suffer in collectivist cultures throughout Asia, the Middle East and Africa [4, 12]. Today global student population continues to change rapidly and steadily reflects the myriad of cultures it represents. Culture includes but not limited to ethnicity, socio-economic status, language, geographic origin, learning manner and abilities, gender and so on it is sensible to retry our teaching approaches and to ponder the role of multicultural approach in the teaching and learning of our students, particularly in the subject of mathematics. School environment and the role of teachers are important in which teachers themselves need to be aware of the diversity that exists in the classroom and how the socio-cultural factors affect academic achievement of students [42]. Teacher's perceptions and attitudes towards cultural diversity is the key to motivation, education and the difference in the lives of children in her class [6]. Thus, Hui (2007) stated that to teach children of various races effectively, teachers in need are teachers who are willing to take difficult responsibilities and have critical thinking [28]. One of the tasks of education in any country is that developed the knowledge of teachers in any mathematical matters. In Iran, many provinces have cultural diversity that needs various teaching and learning methods. Although there are different and modern methods but it seems that teachers of mathematics did not enough teaching courses for cultural diversities. Classes which have cultural diversities, have to follow techniques and methods that motivate students and ease learning mathematics for them. Therefore researchers are going to study the status of cultural diversity in one of the province of Iran.

2 The Literature of Culture and Mathematics

School is at the core of the question of the quality of future living together in a multi-ethnic society, as key institution for the acquisition of cross-cultural competences that can favor social cohesion, and of necessary competences for economic and political integration of the citizens of the future [2, 16]. The perspective of cross-cultural education is central within European orientations [13, 32]. School is a privileged place where to promote cross-cultural competences as the ability to learn and respect cultural diversities and the "research of social cohesion, in a new vision of citizenship suitable for current pluralism in which most attention is focused on building a convergence towards common values" [17, 35]. On other hand, culture generally refers to patterns of human activity and the symbolic structures that give such activity significance. There are many different definitions of "culture" and each one of them reflects a different theoretical base for understanding or criteria for evaluating, human activity. The term culture denotes the whole product of an individual, group or society of intelligent beings. The term includes technology, art, science, as well as moral systems and the characteristic behaviors and habits of the selected intelligent entities. In mathematics education, although reform documents highlight "mathematics for all" [30, 31] as the principle of equity and excellence, they do not provide a coherent conception of equity or strategies for achieving it [14, 22, 34]. The multicultural education literature emphasizes issues of cultural and linguistic diversity and equity, but with little consideration of the specific demands of the different academic disciplines [21]. Since mathematics usually tends to be presented as a set of objective and universal facts and rules, these subjects are often viewed as "culture free" and not considered socially and culturally constructed disciplines [22, 34, 36]. Teachers need to understand what counts as knowledge in math as well as how knowledge may be related to norms and values of diverse languages and cultures. Instructional practices have traditionally relied on examples, analogies, and artifacts that are often unfamiliar to non-mainstream students [8, 32]. Teachers who provide culturally relevant instruction capitalize on student strengths—what they do know instead of what they do not know. For example, the curriculum of the Algebra Project [41] uses student knowledge of the subway system as a basis for understanding operations with integers. The focus on student strengths contrasts to a remediation model of teaching urban students, where curriculum and instruction are predicated on what students do not know and often emphasize rote skills [20, 33]. Dealing with integrating diverse cultures in the classroom needs a
conceptual framework in order to make coherent decisions as a teacher. Here Larry Hatfield introduced three well-known and respected approaches in teaching mathematics while integrating diverse cultures: 1) The Situated Perspective: in the situated perspective, "learning becomes a process of changing participation in changing communities of practice in which an individual's resulting knowledge becomes a function of the environment in which she or he operates" [40]. The situated perspective (in contrast to constructivist perspectives) emphasizes interactive systems that are larger in scope than the behavioral and cognitive processes of the individual student. Mathematics knowledge in the situated perspective is understood as being co-constituted in a community within a context. It is the community and context in which the student learns the mathematics that significantly impacts how the student uses and understands the mathematics [7]. Boaler (1993) suggests that learning mathematics in context assists in providing student motivation and interest and enhances transference of skills by linking classroom mathematics with real-world mathematics [10]. She argues that learning mathematics in contexts does not mean learning mathematics ideas and procedures by inserting them into "real-world" textbook problems or by extending mathematics to larger real-world class projects. Rather, she suggests that the classroom itself becomes the context in which mathematics is learned and understood: "If the students' social and cultural values are encouraged and supported in the mathematics classroom, through the use of contexts or through an acknowledgement of personal routes and direction, then their learning will have more meaning", 2) The Culturally Relevant Perspective: Gloria Ladson-Billings (1994) developed the "culturally relevant" perspective as she studied teachers who were successful with African-American children. This perspective is derived from the work of cultural anthropologists who studied the cultural disconnects between (White) teachers and students of color and made suggestions about how teachers could "match their teaching styles to the culture and home backgrounds of their students" [24]. Ladson-Billings defines the culturally relevant perspective as promoting student achievement and success through cultural competence (teachers assist students in developing a positive identification with their home culture) and through sociopolitical consciousness (teachers help students develop a civic and social awareness in order to work toward equity and social justice). Teachers working from a culturally relevant perspective, a) demonstrate a belief that children can be competent regardless of race or social class, b) provide students with scaffolding between what they know and what they do not know, c) focus on instruction during class rather than busy-work or behavior management, d) extend students' thinking beyond what they already know, and e) exhibit in-depth knowledge of students as well as subject matter [25]. Ladson-Billings argued that all children "can be successful in mathematics when their understanding of it is linked to meaningful cultural referents, and when the instruction assumes that all students are capable of mastering the subject matter". Mathematics knowledge in the culturally relevant perspective is viewed as a version of ethnomathematics—ethno defined as all culturally identifiable groups with their jargons, codes, symbols, myths, and even specific ways of reasoning and inferring; mathema defined as categories of analysis; and -tics defined as methods or techniques [11]. In the culturally relevant mathematics classroom, the teacher builds from the students' ethno or informal mathematics and orients the lesson toward their culture and experiences, while developing the students' critical thinking skills [18], and 3) Critical Pedagogies: rooted in the social and political critique of the Frankfurt School, critical pedagogies perceive mathematics as a tool for sociopolitical critique. In the critical perspective, mathematics knowledge is seen as demonstrating these three competences [37]. Mathematical competence is demonstrating proficiency in the normally understood skills of school mathematics, reproducing and mastering various theorems, proofs, and algorithms. Technological competence demonstrates proficiency in applying mathematics in model building, using mathematics in pursuit of different technological aims, and reflective competence achieves mathematics' critical dimension, reflecting upon and evaluating the just and unjust uses of mathematics. Skovsmose contends that mathemacy is a necessary condition for a politically informed citizenry and efficient labor force, claiming that mathemacy provides a means for empowerment in organizing and reorganizing social and political institutions and their accompanying traditions.
3 Research Design

3.1. Hypothesis
First hypothesis: teachers of mathematics have cultural diversity management regard to cooperative and scientific activities of students.
Second hypothesis: regard to students' opinions, teachers of mathematics has cultural diversity management regard to cooperative and scientific activities of students.

3.2. Method and Samples
Regard to research subject, it is used of survey method. The survey method is capable of obtaining information from large samples of the population. It is also well suited to gathering demographic data that describe the composition of the sample. Survey method is inclusive in the types and number of variables that can be studied, require minimal investment to develop and administer, and are relatively easy for making generalizations. Survey method can also elicit information about attitudes that are otherwise difficult to measure using observational techniques. Then it must select one province that has cultural diversity; Hormozgan-Kish Island is selected via semi multi-steps cluster sampling method and all high schools are chosen. All boy students and teachers of mathematics are considered that equated 165 and 47 people respectively. Via Cochran formula, 40 boy students and 27 teachers are chosen as samples.

3.3. Research Tools
Two questionnaires are designed for studying cited hypothesis. First questionnaire was related to teachers of mathematics. This tool has 30 questions and second questionnaire has 45 questions for students of mathematics that both questionnaires have three Likert scales; "Yes", "Natural" and "No". All questions have content about the conditions of class, cultural diversity and performance of teachers with students in mathematics. Reliability and validity of questionnaire has been proved. These questionnaires are implemented in during second term of 2012-2013 and researchers stated how completed of them for teachers and students of mathematics for two sessions.

4 Findings and Discussion

For studying respected hypothesis, it is used of one-sample Kolmogorov-Smirnov test firstly. Data are not normal in this test (P<0.05). Then one sample sign test is applied. As it is clear in Table 1, it can show that first hypothesis is accepted for Q11, 13, 15, 26, 29, 30 (P>0.05) but this hypothesis did not accept for Q10, Q12, Q14, Q22, Q23, Q27 (P<0.05). Therefore it cannot argue that this hypothesis has been accepted. As it is shown in Table 2, it can indicate that second hypothesis is accepted for Q34, 35, 37, 38, 42, 43, 44 (P>0.05) but this hypothesis did not accept for Q12, 32, 33, 36, 45 (P<0.05). Therefore it can argue that this hypothesis has been accepted.
Table 1: The results of data for teacher questionnaire

<table>
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<td>21</td>
<td>6</td>
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<td>0</td>
<td>24</td>
<td>3</td>
<td>0.12</td>
<td>1</td>
</tr>
<tr>
<td>Q 22</td>
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<td>7</td>
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Table 2: The results of data for student questionnaire

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In first hypothesis, it is proved that teachers of mathematics have not cultural diversity management regard to cooperative and scientific activities of students. In studying this hypothesis, it is indicated that for teachers of mathematics;

- Ethnical and religious minorities have important and all students are not same and they cannot manage various cultures in mathematics classes,
- Communicating with all students of mathematics is difficult,
- They cannot communicate to students of mathematics with religious minorities easily,
- They are more comfortable when some students with particular culture not be in mathematics classes, and
- They did not like cultural diversity in math classes and liked that all students have same culture.

It seems that teachers of mathematics have not enough information of students with cultural diversity and how teach to them and it's possible that they could not communicate very well. There is possibility that this view creates for teachers that they have to teach mathematics with same method that they have learned in pre and in-services. For second hypothesis, it is proved that regard to students’ opinions, teachers of...
mathematics has cultural diversity management regard to cooperative and scientific activities of students. It seems that students have assimilated self to teachers’ procedure in classes and consented of teaching-learning methods. It's possible that class management has more important than cultural management for students of mathematics. It's possible that ethnical and cultural conditions have not important for them.

5 Conclusion

Always mathematics has been considered as a principle where success is limited to a minority as opposed to a majority of children. During years ago, there has been efficient effort by teachers of mathematics to change this attitude of mathematics to an subject that focuses on making mathematics sensible and enjoyable for all students. Reform efforts address subjects as the need for relevance by virtue of providing real-life applications, collection and organization of data, and problem solving as opposed to rote memorization of procedures. In addition, the Curriculum and Evaluation Standards for School Mathematics (NCTM, 1989), prepared by the National Council of Teachers of Mathematics, while not directly addressing cultural diversity issues, advocates instructional practices that include the use of manipulative materials, cooperative work, communication of mathematical ideas in everyday language, and writing about mathematics. It seemed like a natural fit that cultural diversity and mathematics join together to make mathematics truly a discipline for all. In light of these facts, 1) all students can learn and should be afforded the opportunity to do so, 2) a repertoire of best practice must be at the forefront to facilitate essential knowledge, attitudes, and skills for all children, 3) mathematics should be facilitated through emphasis on more problem-solving, hands-on activities, interactive learning experiences, and alternative assessment, and 4) education is the responsibility of all people, not simply the classroom teacher. Regard to findings and results of present research, it can indicated that teachers of mathematics have not proper skills for management of cultural diversity in Iranian schools in particular at provinces with cultural diversity. Therefore researchers suggest following items:

- It's important that have to implement courses which teachers of mathematics participated for enough information of cultural diversity,
- Informing of computational methods in multi-cultural (non-Iranian) schools till teachers and educators of mathematics informed of teaching and learning methods for cultural diversity, and
- Authors and educators of textbooks have to note that structures of math books have to accord to all cultures.

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