An Application of Conceptual Change Approaches to Cultural Issues Among High School Students

Hashem Fardanesh

Associate Professor
Department of Education

Tarbiat Modarres University

Email: fardan_h@modares.ac.ir

January, 2006

Abstract

Conceptual change as the foundation of meaningful learning is discussed and applied to the change in the context of cultural issues among high school students. Cultural issues are envisioned as the repertory of internal cognitive structure of individuals that shapes the foundations of their attitudinal and behavioural functioning. Each one of the four different conceptual change models claim to be the best explaining model for this phenomenon. A field study using a questionnair was conducted to seek out: 1) the model(s) that best describ the process of conceptual change; 2) ranking of cultural issues among students ;and, 3) which cultural issues are most crucial to high school students. Findings show that: 1) Chi and Roscoe's, and Disessa's model of conceptual change best describ the changes students experienced during the past year; 2) ranking of cultural issues starts with Economical and ends with Aesthetic issues: and, 3) Economical, Individual, and Family issues were subject to radical change during the past year. Some educational implications of the findings concludes the report.

Key Terms: conceptual change, culture, cultural issues, conceptual change models, high school students.

Introduction:

What are high school students conceptions about cultural issues? How do they think about their life problems; religious beliefs; their relationships with their friends and family members; their future profession; the values that must preserve; etc.? Students have mental representations of these issues, and when these conceptions change, they undergo the process of conceptual change. Conceptual change is the underling mechanism of meaningful learning. Conceptual change occurs when one transfers from the position of "incomplete" conception of an issue or phenomenon to the position of "complete" conception of that issue or phenomenon. Being "complete" is relativistic, and one repeatedly reconsiders his/her conceptions and mental models during his/her process of cognitive development. Conceptual change has been represented as a process of achieving structural insight, accommodative learning, understanding of relations, deep learning, or-more recently- mental building (Mayer, 2000).

Conceptual change has long been recognized as a fundamental aspect of all kinds of learning in sciences and cultural issues. Understanding the process of conceptual change would make important contributions both to the development of learning theories, and the processes people undergo when they change their conceptions about cultural issues.

After studying the meaning of cultural issues, four models of conceptual change will be described and compared. A report of conducting a survey on high school student in a metropolitan context will be presented. A questionnaire about the student's views on mechanism of conceptual change in the domain of cultural issues was used. The questionnaire was administered to 300 students, and results show that Chi and Rosco's and Dissesa's models best describe their process of conceptual change. Among cultural issues: economic, individual, professional and religious issues are perceived to be the most important issues. Some educational implications of the findings will be discussed at the end.

Cultural Issues:

Discussing about cultural issues necessitates studying culture, what is culture? What is the definition of culture? The word ***culture*** comes from the Latin root *colere* (to inhabit, to cultivate, or to honor)[1]. In general, it refers to human activity; different definitions of *culture* reflect different theories for understanding, or criteria for valuing human activity.

A 2002 document from the United Nations agency, UNESCO states that culture is the "set of distinctive spiritual, material, intellectual and emotional features of society or a social group and that it

[1] http://www.culturalsavvy.com/culture.htm

encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs". (UNESCO, 2002)

John Bodley has introduced a comprehensive list of definitions for culture:

Insert Table 1

Describing a culture, as “culture of the X” seems not in coordination with the perspective of the beginning of the 21st century. In a world of diverse and multiple identities labeling any set of people as “the X” is problematic. But the problem lays with the phrase “the culture of the X”. It was thought that all the Xs used to think, feel, and act in a similar way, and this way of life was preserved for centuries, if colonial education and modern media had not intervened. But, cognitive accounts about the meaning of cultural issues define these issues as the interpretations that are formed in a person by an object or phenomenon at any given time (Strauss and Quinn, 1997:6). This interpretation encompasses the meaning of the words, but is not restricted to it, and in general the interpretation of an object or phenomenon includes its identification, expectations about it, feelings of it, and the motivation to respond to it.

This definition for meaning makes it situational and a momentary states, but it is the product of two relatively stables structures: intrapersonal, mental structures (which are also called “schemas”, or “understandings” or “assumptions”), and extrapersonal world structures. Schemas are defined as the network of connected cognitive elements that represent the general meanings present in memory (Rumelhart, Smolensky, McClelland, & Hinton, 1996: 18). Relative stability of schemas and world structures in a person or in a group of people who share their way of life will cause to form similar meanings in them. This definition of meaning makes it an psychological issue (cognitive-affective responses), and emphasizes the point that meanings are the result of interaction of current events in public world with mental structures which are in turn the product of previous interactions with the public world.

In other words, meaning of something (a word, an object, or an event) for a person is closely related to what he/she experiences in that moment, and the interpretive frameworks that he/she brings to the situation based on his/her previous experiences. A cultural meaning is the typical (frequently recurring and widely shared aspects of the) interpretation of some type of object that is evoked in people as a result of their similar life experiences (Spiro, 1987:163). The reason why they are called cultural meanings is that it provokes a different interpretation based on various characteristics of life experiences. The “meaning” of something is always associated with the fact that meaning is the summary of the method of referring to cultural meanings.

Based on the above definitions, it is not possible to think of an identity such as “culture X” which contains meanings for people X. In other words the more “culture” refers to an identity over and above human products and acquired mental structures, the farther we get from its current meaning. Culture should not be referred to as an independent identity, because the more people have common and frequent experiences (experiences that are mediated by human products and have formed similar schemas) it seems more logical to discuss about their cultural shared-ness. There is no differentiation between cultural and individual representations, because representations are continuously and widely distributed, and hence more or less cultural. Culture consists of regular occurrences in the humanly created world, in the schemas people share as a result of these, and in the interactions between these schemas and this world. Thus, cultures could not be categorized or separated, each person shares some experiences with those who watch the same TV programs, and shares some experiences with those who read the same newspapers, and shares some experiences with those who have gone through formal schooling, even though their schools are located half way around the globe. This fact makes each person the connecting point between all the numerous overlapping cultures. It might be said that the contexts in which these experiences have been acquired are different, this is true, the context in which experiences are acquired deeply effect the schemas produced through them, but this fact should not be the ground for the conclusion that cultural commonality is the result of time and place commonality, rather attending to physical and geographical boundaries must be diverted to common humanly experiences that only partly share common time and place. In conclusion the following points could be drawn from the above discussion:

1. Explaining cultural meanings without consideration of the interaction between two domains of intrapersonal and interpersonal is impossible. Stability and changeability of cultural meanings is the product of the complex interaction between these two domains.
2. Studying the function of mental processes that is the foundation of conceptual change is a key requisite for understanding common social beliefs.
3. Studying the process of socialization and internalization of experiences by students during their stages of development is important for understanding interpersonal cultural issues among students.

Conceptual change:

As was mentioned above conceptual change is the change in representations that are the product of interaction of mental structures with external objects or events. Conceptual change shapes the

foundations of meaningful learning, and has been the subject of numerous studies among ethnographers and educationalists. Four perspectives about conceptual change have been introduced that is the topic of our review in the following pages:

1. Vosniadou's synthetic meaning view, conceptual change as synthesis.

Vosniadou (2002) discusses conceptual change with regard to physics rules and principles. According to his analysis the student prior to instruction has some initial explanatory frameworks based on his/her previous personal experiences. Going through instruction about the topics of initial explanatory framework causes some contradictions in his/her mental models, that in turn produces instability in mental representations. (Figure 1)

Insert Figure 1

The combination of instructional material and initial explanatory frameworks, or student's existing mental models, forms an instable synthetic meaning. This synthetic meaning is incoherent and causes internal instability, and considering the fact that student seeks a coherent explanatory framework about the performance of physical phenomenon, a need for dissolving the internal incoherence is initiated. Resolution of internal incoherence is done by the reorganization of existing knowledge structures, and in this process the prior knowledge is both a stimulus for change (because the new contradictory knowledge is assimilated by it), and an obstacle to change (because it must be changed).

2. Chi and Roscoe's misconception repair view, conceptual change as replacement

In Chi and Roscoe's (2002) repair of misconceptions view, the student's initial mental models are naïve and are based on incorrect conceptions, and ought to be replaced for deep understanding to take place. These incorrect conceptions (misconceptions) are viewed as obstacles for conceptual change. Student's goal is to build an accurate mental model about the performance of something. Student's misconception means that there are concepts within his/her mental structure that are classified incorrectly, and the correct classification must be found, or created. Therefore conceptual change is the replacement of a concept from its incorrect classification to its correct classification. This process is called omission of misconceptions, and results in the formation of changed or correct mental model. (Figure 2)

Insert Figure 2

Through recognizing incorrect conceptions, and trying to replace it, students become involved in the process of repair that results in conceptual change. Some misconceptions are easily corrected by encountering instruction, but some misconceptions resist change even after going through instruction. Conceptual change takes place either through the process of assimilation (adding up the new knowledge elements to the existing knowledge structures), or through the process of fundamental change (correcting pieces of knowledge), and in either case it is an incremental process.

3. Disessa's view of conceptual change, change as organizing

In Disessa's (2002) view, student tries to understand his/her experiences by means of his/her naïve knowledge that Disessa calls "phenomenological primitives". Phenomenological primitives are small pieces of fragmented knowledge along with natural affects. Student is the producer of the knowledge who strives to build connections between diverse elements of his/her knowledge. In the process of conceptual change the naïve knowledge gets integrated into a complex explanatory system. The initial naïve knowledge would not be the same biased and fragmented explanations; rather they become part of a larger system (Figure 3). In other words they find their place in a complex knowledge system.

Insert Figure 3

Prior knowledge makes the conceptual change possible, because conceptual change involves organizing fragmented pieces of one's existing knowledge. What is changed is the way that the fragmented knowledge is organized into structured knowledge. Learning or conceptual change constitutes building a system of complex knowledge that contains numerous conceptual elements that are changed and integrated. Student organizes many naïve and simple elements into a structured mental representation.

4. Ivarson, Scholtz, and Saljo's view of conceptual change, change as tool appropriation

Ivarson, Scholtz, and Saljo (2002) declare that conceptual change takes place through the use of; mental tools (such as concepts); cultural tools (e.g. language); and physical tools (such as maps and globes), within social activities or collective cultural practices. They say "human cognition is socialized through participation in activities where tools are used for particular purposes" (2002: 78). Student begins by using

inappropriate tools and have to learn to be more efficient user of the tools. They are users of tools in social contexts (Figure 4).

Insert Figure 4

Mental functioning is irrevocably intertwined with a vast expectrum of cultural tools. Thus studying mental processes apart from cultural tools is impossible. Therefore conceptual change dose not occur within individuals, rather it occurs in the interaction between individuals, tools and other individuals. What changes is the way tools are used in different contexts. Conceptual change involves initiating new functions for using tools, and cognition is defined as using tools.

Mayer (2002) has summerized characteristics of the above mentioned conceptual change models in a table (Table 2). He declares that to intergrate the first three models that describe the process of conceptual change as an internal mental process is not so difficult, but the fourth model (Ivarson, Schults, and Saljo) that describes conceptual change as the process of socialization because of its different epistemological foundations could not be summerized and integrated with the other three models.

Insert Table 2

Based on the above brief explanation about cultural concepts and meanings, and four conceptual change models, it is intended to study the following questions by conducting a survey research; (1) which one of the conceptual change models best describes the way changes occur in cultural meanings among high school students? (2) What are the three main cultural concepts important to 16-17 year old students who have experienced substantial change in them during past year, and finally, (3) identification and prioritization of cultural issues in students` views.

Survey Methodology:

1. Subjects

One of the central school districts of a populated city that most appropriately represents social and geographical characteristics of high school students in the city (6^{th} district) was selected as the site of the study. This district located in the center of the city in every aspect represents the average middle class families residing in the city. Three girl public high schools and three boy public high schools were randomly chosen using a multi level cluster sampling method. All 10^{th} grade classes within each school were selected, and data was collected from all the students in all classes. In tolal 150 boys, and 150 girls responded to the questionnaire, and after omitting the incomplete responses the total

number of boys and girls who completed the questionnaire were 139 and 135 respectively.

2. Instrument

To answer the research questions a questionnaire was desinged based on Lotfabadi and Nowroozi's (2004) classification of cultural issues that is in turn based on Zetterberg's (1997) analysis of those issues. Lotfabadi and Nowroozi state that value system is the "repertory of internal optimal qualities in the cognitive structure of individuals, as the most internal layer of each person's character that shapes the foundations of their attitudinal and behavioral functioning" (2004:42). They say that there are ten categories of issues under the value system; individual; Family; Economic; Political; Social; Aesthetical; Scientific; Religious; National and International. These categoires were used to priortize the students' cultural issues in the form of a concept map. To make the questionnaire simple for the students, a brief statement about each category was given. For example for the "individual" category the statement was: "myself and developing my capabilities", and for the "social" category they were given an statement; "social problems, such as poverty, unemployment, and ediction". Detailed statements for each category is given in the following table (Table 3).

Insert Table 3

The initial questionnaire was examined by three university scholars, and after implementing some miner changes in the wording of questions, its content validity was confirmed by them. To measure the reliability of the questionnaire, it was administered to 20 students from the same population with a two weeks lag time, and the test-retest reliability coefficient was calculated at 0.92.

3. procedures

The questionnaire was administered in normal conditions in the regular class time. The teachers did not interfer in the administration, and the administrator only responded to some questions regarding the way of answering the questions. There was no time limit for completing the questionnaire, and students took at least 7 and at most 12 minutes to complete the questionnaire.

4. Findings

In this section three research questions will be discussed:

1.what score do the students assign to the cultural issues on a 1-20 rating scale? The following table shows the average score for each cultural issue by gender;

Insert Table 4

A mixed between-within subjects ANOVA was conducted to compare scores on ten cultural issues. There was significant difference between cultural issues scores: Wilks' Lambda=.256, F(9)=85.403, p<.0005, multivariate eta squared=.744. The interaction effect was significant, Wilks' Lambda=.845, F(9)=5.383, p<.0005, with interaction effect=.155, that is a very large effect (Cohen, 1988).

There was no significant difference between boys and girls ratings on cultural issues scores, F(1, 272)=1.112, p=.292, with a very small effect size, .004.

A one way repeated measure ANOVA was conducted to compare the cultural average scores for girls and boys. For girls four issues; individual; family; economic and religious form a subset with the highest average scores and statistically different from other issues, Wilks Lambda=.289, F(9)=34.515, p<.0005, multivariate eta squared=.711. Other issues, except for the political issue with the lowest average score (10.38), also formed a subset with significant difference with other issues. Figure 5 shows girls' and boys' average scores for cultural issues.

A one way repeated measure ANOVA was conducted to compare the cultural average scores for boys. For boys four issues; economic; individual; family; and religious form a subset with the highest average scores and statistically different from other issues, Wilks Lambda=.191, F(9)=61.153, p<.0005, multivariate eta squared=.809. Other issues, except for the aesthetic with the lowest average score (10.43), formed another subset.

Insert Figure 5

2. Identifying three cultural issues that were subjcet to radical change during the past year among 16-17 year old students was the subject of the second research question. Table 7 shows the total effect coeffiecients of cultural issues with respect to sex;

Insert Table 5

The overall effect size for the issues shows that the economical, individual, family and religious issues are the top four cultural topics that students are most engaged with.

3. Last but not the least: Which one of the conceptual change models best describe the changes that students have experienced? Table 8 shows the frequency of experienced models for each cultural issue and sex.

Insert Table 6

A Chi-square test to compare the total number of each models' application was conducted and resulted a Chi-square value= 102.308, 3df, and p<.0005, with minimum expected cell frequency =188.5. This shows that Chi and Roscoe's, and Dissesa's explanation for conceptual change are more significantly used by students than Vasniadou's and Ivarson et al's models.

Disscusion

Identifying four most important cultural issues for high school students (Economic, Individual, Family and Religious), relays a clear message to educationalists about the orientation of academic programs that are planned and presented to students. Students are sending a powerful signal about their main concerns, and this message should be heard, and responded to appropriately.

Three issues that were subject to fundamental change during past six months to one year period among students correspondes exactly with the priorities asigned to cultural issues. These issues (Economic, Individual, and Family) portray students' main mental engagement during one of the most important periods of their lives. The first priority given to economical issues reflects student's main concern about their future profession, income, and future economic well being. How could educational planners respond to this deep feeling of need among students? One logical answer might be to equipe students with some sort of expertise or skills necessary for them to cope with uneasy economical conditions of the society.

The conceptual change models mostly used by students (Chi and Roscoes' repair of misconceptions, and Disessa's organizing model) have some very important curriculum planning implications for educationalists and curriculum planners. In Chi and Roscoes model conceptual change occurs when students find out that their initial mental models are naïve, incorrect and have to be replaced. These misconceptions are obstacles to deep understandings. Misconceptions are defined as mis-classification; concepts and ideas are classified under incorrect classes, and learning begins when students recognize their misconceptions. The implication of this description of conceptual change is to have students describe and explain their present conceptions about different issues, and discuss it with their classmates under their teachers' supervision. In such a setting the probability of students recognition of their misconceptions becomes more probable.

In Desessa's model, conceptual change occurs when students organize their initial small pieces of fragmented knowledge in a complex

explanatory knowledge system. The student finds the right place of each piece of knowledge in a more comprehensive knowledge system, and by so doing organizes his/her primitive knowledge . The implication of this approach is to have students connect, integrate and combine their understandings about cultural issues, and conseguently come up with some kind of theory-like generalization. This practice will provid the opportunity for reconsidering and organizing their knowledge and will result in conceptual change.

Bruning, et al. (1995) reporting Pintrich et al's summary of studies in conceptual change identifys four necessary conditions for meaningful conceptual change to occur. One condition is dissatisfaction with current conceptions. Unless students (and teachers) have sufficient reason to abandon naïve belifes, it is unlikely that a radical change will occur. The second condition is that new conceptions must be intelligible. Clearly, students will feel little need to replace existing beliefs with new beliefs that have even less explanatory power. The third condition is that new conceptions must be plausible. In essence, plausibility increases the chances that new beliefs will be related meaningfully to existing knowledge structures and be used during problem solving. The final condition is that new frameworks must appear fruitful in order to facilitate further investigation.

Future research on the processes involved in conceptual change in each of the models discussed in this study will iluminate the path to meaningful learning within and outside schools.

References

Bodley, J. H. (2000). Cultural Anthropology: Tribes, States, and the Global System, 3rd edition, Mayfield, Mountain View, CA.

Bruning, R. H., Gregory, J. S. & Ronning, R. R. (1995). Cognitive Psychology and Instruction. Merrill, Upper Saddle River, New Jersey.

Chi, M. T. H. & Roscoe, R. D. (2002). The Process and Challenges of Conceptual Change. In M. Limon, & L. Mason, (Eds.). Reconsidering Conceptual Change. Issues in theory and practice, 3-27. Kluwer Academic Publishers. Netherlands

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ; Erlbaum.

Ivarsson, J., Schoultz, J. & Saljo, R. (2002). Map Reading Versus Mind Reading. In M. Limon, & L. Mason, (Eds.). Reconsidering Conceptual Change. Issues in theory and practice, 77-99. Kluwer Academic Publishers. Netherlands.

Lotfabadi, H., Nowroozi, V. (2004). Theory-making and Scale Creating for Assessing the Value System of High school Students. *Quarterly Journal of Educational Innovations*, No. 7, pp 35-58, Tehran, Iran.

Mayer, R. E. (2002). Understanding Conceptual Change: A commentary. In M. Limon, & L. Mason, (Eds.). Reconsidering Conceptual Change. Issues in theory and practice, p. 108. Kluwer Academic Publishers. Netherlands.

Mayer, R. E. (2000). Conceptual Change. In A. E. Kazdin (Ed.), Encyclopedia of Psychology. Vol. 2, PP 253-255, Washington, DC: American Psychological Association.

Pintrich, P. R., Marx, R. W., & Boyle, R. A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, 63, 167-199.

Rumelhart, D. E., Smolensky, P., McClelland, J. L., & Hinton, G. E. (1996). Schemata and sequential thought processes in PDP models. In J. L. McClelland et al., Parallel distributed processing, Vol. 2ed. Edition, MIT Press. Pp7-57.

Spiro, M. E. (1987). Collective Representations and Mental Representations in Religious Symbol Systems. In Culture and Human Nature: theoretical papers of M. E. Spiro, ed. B. Kilborne, & L. L. Langness, University of Chicago Press.

Strauss, C. and Quinn, N. (1997). A Cognitive Theory of Cultural Meaning. Cambridge University Press. U.K.

Vosniadou, S. (2002). On the Nature of Naïve Physics. In M. Limon, & L. Mason, (Eds.). Reconsidering Conceptual Change. Issues in theory and practice, 61-76. Kluwer Academic Publishers. Netherlands.

Zetterberg, H. (1997). The Study of Values. Stockholm. Value Scope, AB.

Table 1: diverse definitions for culture	
Topical	Culture consist of everything on a list of topics, or categories, such as social organization, religion , or economy
Historical	Culture is social heritage, or tradition, that is passed on to future generations.
Behavioral	Culture is shared, learned human behavior, a way of life.
Normative	Culture is ideals, values, or rules for living.
Functional	Culture is the way humans solve problems of adapting to the environment or living together.
Mental	Culture is a complex of ideas, or learned habits, that inhibit impulses and distinguish people from animals.
Structural	Culture consists of patterned and interrelated ideas, symbols, or behaviors.
Symbolic	Culture is based on arbitrary assigned meanings that are shared by a society.

Figure 1: Vasniadou's Conceptual Change Process (Synthetic)

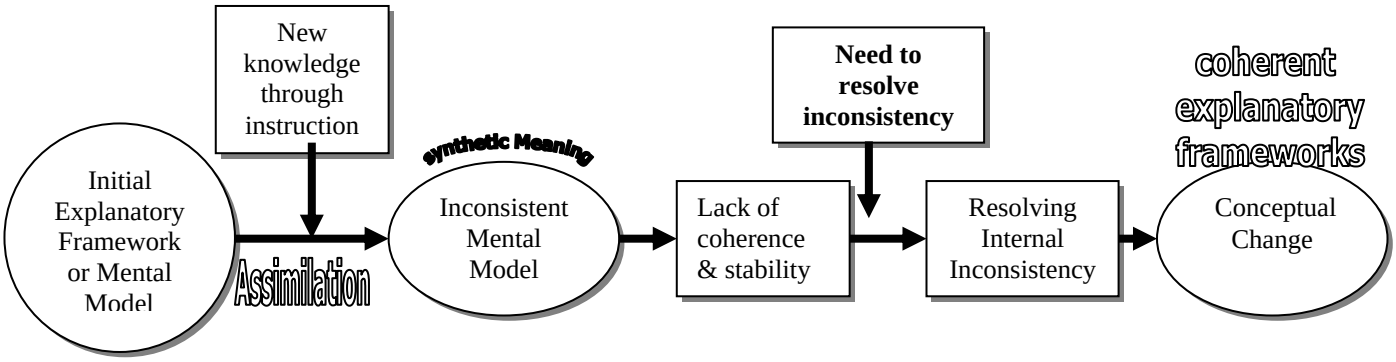
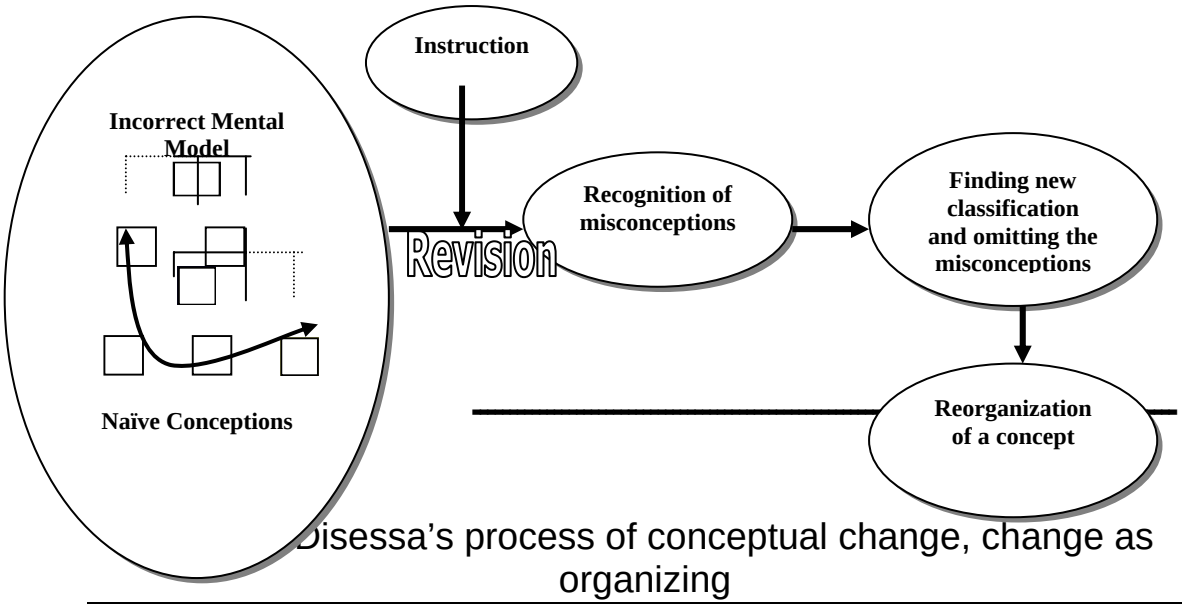


Figure 2: Chi and Roscoe's process of conceptual change, (repair of misconceptions)



Disessa's process of conceptual change, change as organizing

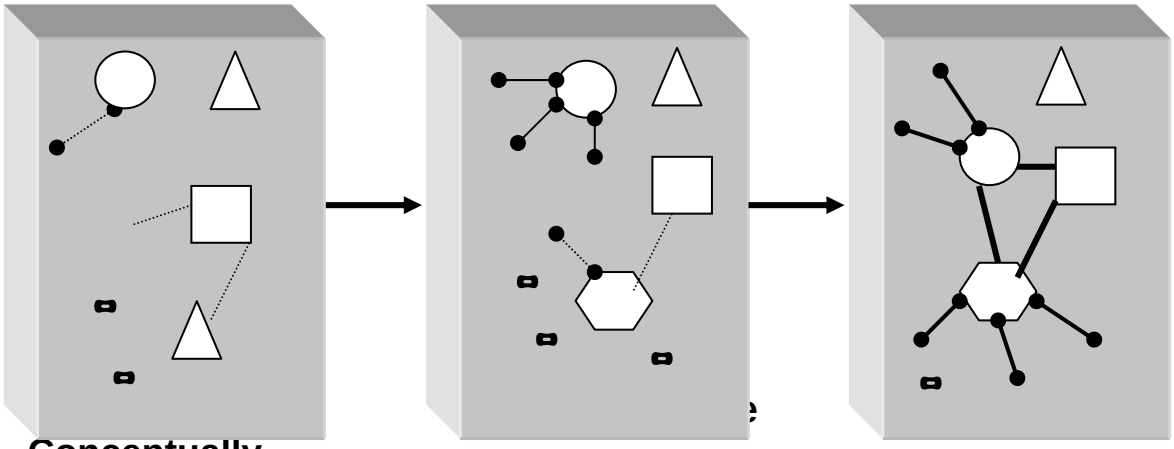


Figure 4: Ivarson, Scholtz, and Saljo's process of conceptual change change as tool appropriation

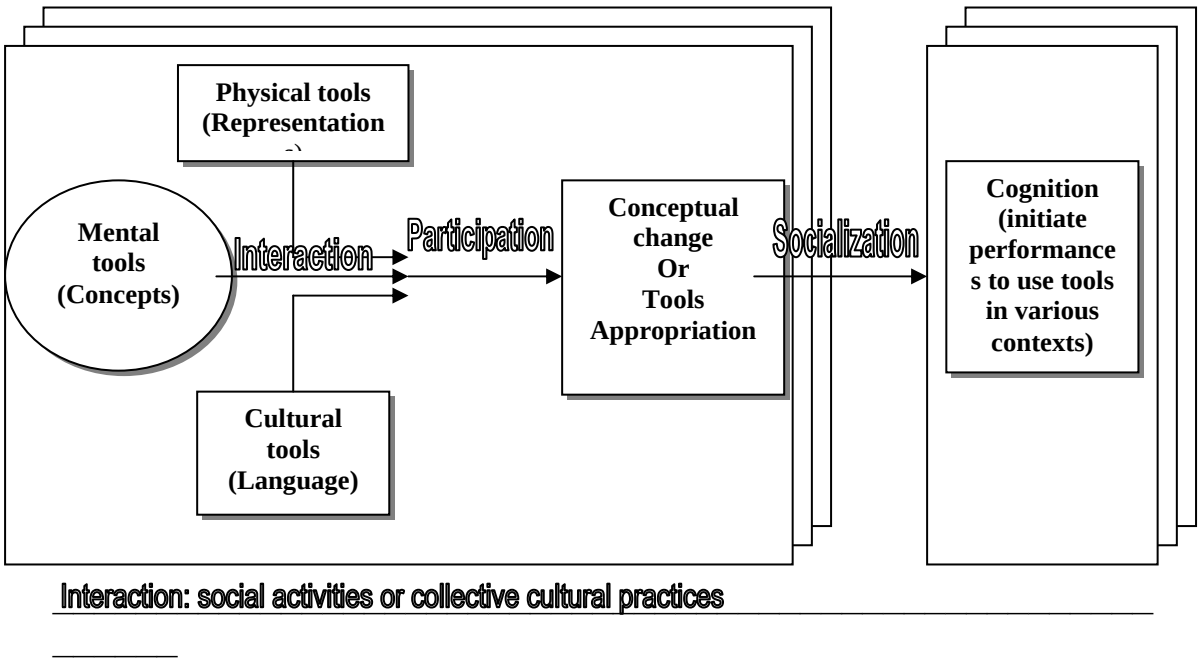


Table 2: Four views of conceptual change

View	What is Conceptual Change?	What changes?	Who changes?	How does change occur?	Where is Change	What prior knowledge?
Vosniadou's Synthetic and Meaning	Change as synthesis	mental model (from incoherent to coherent)	Learners as synthesizers	gradual: adding new information from instruction to initial explanation and reorganizing conflicting representations into a scientific theory	mind	obstacle vehicle
Chi & Roscoe's Misconception Repair	Change as replacement	mental model (from flawed to correct)	Learner as fixers	gradual: repairing incorrect conceptions	mind	obstacle
Disessa's Knowledge in Pieces	Change as organizing	Knowledge (from unstructured to structured)	Learners as organizers	gradual: organizing p-prims	mind	vehicle
Ivarson et al's Sociocultural	Change as tool Appropriation	tool use (from ineffective to effective)	Learners as tool users	gradual: appropriating and mastering mediatied means through participation in cultural practices	society	neither

Table 3: ten cultural issues and its examples

CULTURAL ISSUES	THE STATEMENT USED IN THE QUESTIONNAIRE
Individual	Myself and development of my capabilities
Familiy	My familiy members and what is important for them
Economic	My future job and what is going to make my job more profitable
Political	Society's political issues
Social	Social issues such as poverty, unemployment and ediction
Aesthetical	Literature, poetry, painting, theater and art issues
Scientific	Pulications and scientific issues
Religious	My religious values such as belief in God, and religious obligations
National	Iranian history and culture
International	Western and/or Eastern culture and way of life

Table 4: Average Score of Cultural Issues by Gender

CULTURAL ISSUES	BOYS AVERAGE SCORE	GIRLS AVERAGE SCORE	BOYS AND GIRLS AVERAGE SCORE	RANK OF THE ISSUE
Individual	17.55	18.80	18.16	2
Familiy	18.11	17.80	17.95	3
Economic	19.10	18.27	18.69	1
Political	11.02	10.38	10.70	10
Social	12.28	13.92	13.08	6
Aesthetical	10.43	13.42	11.90	9
Scientific	13.30	12.12	12.71	8
Religious	16.64	17.06	16.84	4
National	12.92	13.20	13.05	7
International	13.62	12.70	13.16	5

Figure 5: Importance of Cultural Issues for Girls & Boys

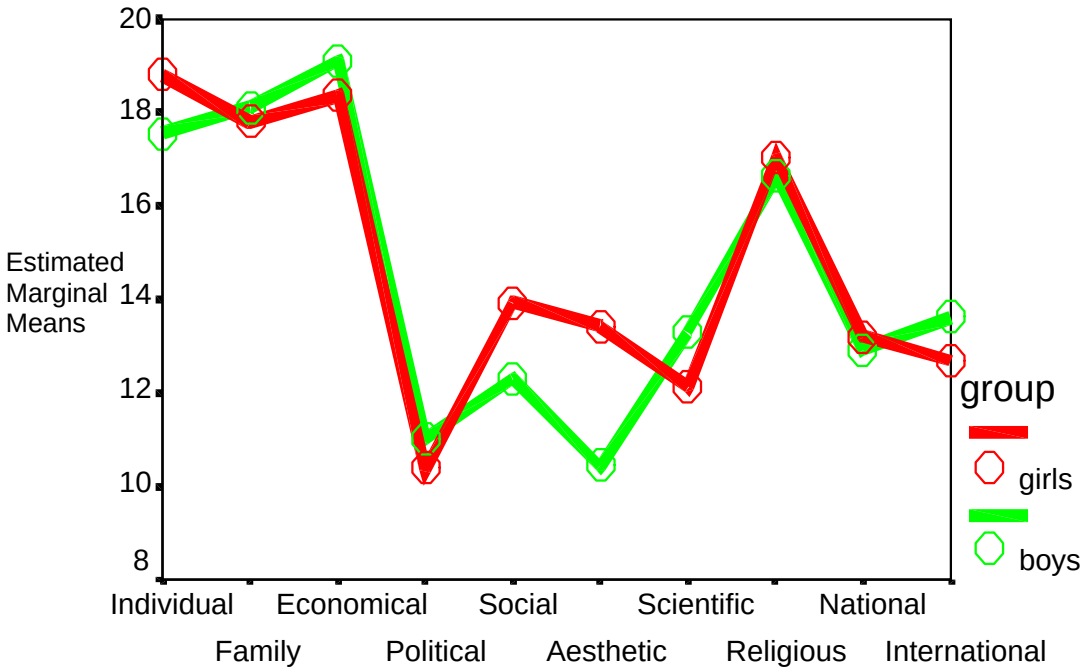


Table 5: frequency of three changed cultural issues with sex

CULTURAL ISSUES	*SEX*	*FIRST ISSUE*	*SECOND ISSUE*	*THIRD ISSUE*	*ROW TOTAL*	*EFFECT COEFFICIENT*	*TOTAL EFFECT COEFFICIENT*
Individual	**Girls**	**35**	**22**	**20**	**77**	**52.66**	**91.16**
	Boys	**22**	**19**	**21**	**62**	**38.5**	
Family	**Girls**	**13**	**19**	**15**	**47**	**27.5**	**64.5**
	Boys	**22**	**16**	**21**	**59**	**37**	
Economic	**Girls**	**26**	**32**	**17**	**75**	**47.67**	**107.5**
	Boys	**34**	**37**	**22**	**93**	**59.83**	
Political	**Girls**	**4**	**6**	**6**	**16**	**9**	**32.83**
	Boys	**14**	**11**	**14**	**39**	**21.17**	
Social	**Girls**	**8**	**6**	**9**	**23**	**14**	**23**
	Boys	**2**	**8**	**9**	**19**	**9**	
Aesthetic	**Girls**	**12**	**8**	**10**	**30**	**19.33**	**29.33**
	Boys	**6**	**6**	**3**	**15**	**10**	
Scientific	**Girls**	**4**	**4**	**5**	**13**	**7.67**	**14.83**
	Boys	**2**	**7**	**5**	**14**	**7.17**	
Religious	**Girls**	**25**	**12**	**28**	**65**	**40.33**	**40.33**
	Boys	**18**	**15**	**15**	**48**	**30.5**	
National	**Girls**	**2**	**9**	**10**	**21**	**9.83**	**22.33**
	Boys	**6**	**7**	**10**	**23**	**12.83**	
International	**Girls**	**7**	**7**	**8**	**22**	**13.17**	**34.33**
	Boys	**11**	**11**	**14**	**36**	**21.17**	

Table 6: Frequency of experienced model with sex

CULTURAL ISSUES	SEX	VASNIADO'S MODEL	CHI & RASCO'S MODEL	DISSESA'S MODEL	IVARSON'S MODEL
Individual	Girls	8	25	22	15
	Boys	10	28	16	10
Family	Girls	2	10	18	9
	Boys	8	12	23	16
Economic	Girls	8	14	32	15
	Boys	10	34	30	18
Political	Girls	1	5	4	5
	Boys	5	14	13	6
Social	Girls	5	6	5	5
	Boys	3	6	7	3
Aesthetic	Girls	0	7	14	6
	Boys	2	8	3	2
Scientific	Girls	1	5	1	4
	Boys	2	1	5	5
Religious	Girls	8	16	25	5
	Boys	4	12	17	14
National	Girls	4	5	9	5
	Boys	5	4	8	4
International	Girls	3	8	6	4
	Boys	4	14	14	4
Total		93	234	272	155