Which environmental education model is relevant for Azerbaijan schools?

Elmira A. Muradova
Baku State University, Azerbaijan

Какая экологическая модель образования важна для школ Азербайджана? *Сегодня большинство инструкции науки об окружающей среде и учебных планов в средних школах и университетах Азербайджана основаны на дидактической модели обучения и изучения, то есть односторонней передачи и студенческого поглощения информации. Студенты, как принято, пассивно получают и поглотят знание об окружающей среде, базируют и помнят теории, которые зарегистрированы в учебниках и в тематическом плане отдельного учителя. Можно утверждать, что это нелогично, чтобы ожидать, что эти очень традиционные обучающие методы будут эффективны при обучении молодой, динамической и очень сложной и интегрированной дисциплины как наука об окружающей среде. В некоторых странах экология не как отдельная дисциплина в средних школах, они включают это в образовательную программу другой дисциплины. До сих пор в Азербайджане используется второй вариант.*

Ключевые слова: *экологическое образование, моделы обучение, конструктивистическая модель .*

Today most environmental science instruction and curricula in secondary schools and universities of Azerbaijan are based on a didactic model of teaching and learning, i.e. one-way transmission and student absorption of information. Students are expected to passively receive and absorb an environmental science knowledge base and remember theories which are recorded in textbooks and in the thematic plan of an individual teacher. It can be argued that it is illogical to expect that these very traditional teaching methods will be effective in teaching a young, dynamic and immensely complex and integrated discipline like environmental science. In some countries ecology is not as separate discipline in secondary schools, they include it to educational program of another discipline. Up to now in Azerbaijan is used the second variant.

There are many different teaching models of environmental education (EE) in world practice. One of the first attempts was made in Europe in the middle of the 1970s. The 3-dimensional model was suggested in 1974 by the Schools' Council in UK and later published by Lucas (1994). It has been mentioned frequently by different researchers (e.g. Palmer (1998), Uzzel (1999), etc.) and adapted according to the development of society. As mentioned by Palmer, Sterling and Cooper (1992), Uzzel (1999) and others, there are three components in the model, which are used for EE organization and planning. They are education **About, For** and **Through /In /From** environment. According to Palmer (1997, 1998), the model consists of two subsystems - formal and informal education - both of which include the three above-mentioned components. The description of the components given below is done on the basis of the definitions and descriptions found in the works by Palmer (1997, 1998), Schools' Council (1974), Sterling and Cooper (1992), and Uzzel (1999). Education ***About*** the environment is usually a part of formal education and has an empirical character. The main aim is to develop knowledge about nature and natural systems using research activities and to form an understanding of the environment, its values and the complex interactions of the elements of the natural and human systems. Education ***Through/In/From*** the environment sees nature as a tool and resource of the learning process in order to develop research activities of a child, to form the individual experience, to develop a wide range of skills of investigation and communication. The aesthetic element predominates here. This component is a part both of formal and informal education. Education ***For*** the environment reflects the ethical element of EE. It puts the emphasis on the development of a personal ethic, a sense of responsibility and informal concern for environment. Its aim is to form positive caring attitude towards the environment.

Since the 1970s different authors have worked out different models of environmental education. Thus, Giolitto *et al.* (1997) suggested a static model according to which there are three dimensions in environmental education: cognitive, ethical and "action" dimensions. The first - cognitive - dimension includes the level of environmental knowledge and skills, which can help to learn, understand and protect the environment. The second one – ethical - assumes the development of values. The last dimension – "action" – includes the development of special behavior patterns and positive attitudes towards the environment.

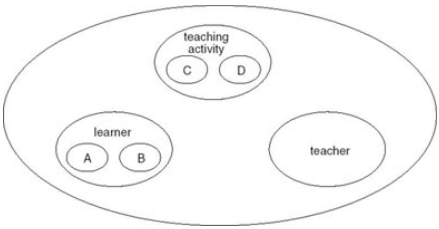
Sterling and Cooper (1992) presented two models for the process through which individuals progress as they become environmentally educated. Both models include all five categories mentioned in the Tbilisi Declaration. The first model is linear. It assumes that the person passes the stages of environmental education in a strict order one by one. But, as the authors mentioned, a person may go through the stages of the process in a different order. A student can complete one or several stages simultaneously. It proves that EE is more complex and interrelated than the suggested linear model. Thus, Sterling and Cooper (1992) present another version of the model in which all elements are interrelated and mutually reinforcing.

Ukrainian researchers Klimov and Ukolov (1994) suggested another model of ecological education according to which the system of ecological education consists of four components: cognitive, normative, "values" and "action". The cognitive element assumes fundamental knowledge about the interaction of man and the environment, basic understanding of the aims and goals of nature conservation process, and global environmental problems and the ways of solving them. Values include the understanding of value of the environment itself (cognitive, ethical, practical values, etc.), the ability to manage human activities within the environment and to foresee the possible changes in the environment as the result of these activities at different levels. The normative element presupposes the ethical, aesthetical and ecological norms of the usage of the environment and the behavior patterns for individuals, groups and society in the environment. The **"action"** element assumes the activities and methods directed toward the development of cognitive, practical and behavioral ecological skills (an ability to evaluate the situation, the choosing of the solution, the development of personal features of the student, etc.).

It is necessary to mention that it was Palmer (1998) who first stated that for the development of EE it is necessary to use not a static but dynamic variant of the model that takes into account individual peculiarities and personal experiences of students. In this case three areas of the model are spheres which rotate constantly. The other difference is that the key element of the model is "formative influences." This element can become more important than the influence of the formal educational programs because it represents the combination of personal experience and formal education. Without taking this factor into account it is impossible to develop a sufficient level of knowledge, skills and values which will form environmental ethics and awareness. Although formative influences use the experience of formal educational programs, they exist independently from programs. That is why it should be considered as a basis for the whole process of EE development.

In recent years, constructivist theory has received considerable attention in education scholarship, practitioner preparation, and policy formation (MacKinnon & Scarff-Seatter, 1997; Richardson, 1997; Teets & Starnes, 1996). It not only emphasises active and collaborative learning, but also requires students and teachers to discover and construct knowledge together. Constructivism is an epistemology, a learning or meaning-making theory that offers an explanation of the nature of knowledge and how human beings learn. It maintains that individuals create or construct their own new understandings or knowledge through the interaction of what they already know and believe and the ideas, events, and activities with which they come in contact (Cannella & Reiff, 1994; Richardson, 1997). Although Constructivism is based on sound theory and research, the jury is still out

on its overall effectiveness as a single instructional approach. While there is evidence that the use of constructivist approaches does promote critical thinking, collaborative learning, and increased student engagement, it is less clear if it results in improved test scores.



A system map of key elements in a constructivist model of learning: the components in the 'learner' subsystem (labelled A and B in Figure) represent: (A) the learner's existing knowledge, skills and attitudes (B) the learner's ideas about how to learn the subject matter of the teaching. The components in the 'teaching activity' subsystem (labelled C and D in Figure) represent: (C) the content of what is taught (D) the methods and media used to teach it.

For teaching which is based on a constructivist model of learning, the starting point is to help students integrate new learning with what they already know. This will very likely mean that existing ideas will have to change, sometimes extensively, especially if the new learning conflicts with existing assumptions and attitudes. The danger otherwise is that we do not realise the contradictions between old and new learning, and existing ways of thinking will tend to undermine new learning. This also means that we need to be aware of how new learning affects what we already know and do. We need to engage in activities which really do foster the new understanding they are aiming for. Without this emphasis on understanding ideas for ourselves and in our own words, study can lead to patchy or superficial understanding. Overemphasis on memorising also tends to take attention away from the effort of understanding.

The constructivist epistemology assumes that students construct their own knowledge on the basis of interaction with their world and communication with their teachers. Over the last two decades the constructivist perspective and its associated teaching strategies have emerged as prominent approaches to the teaching of sciences at both high school and university levels. Significant amongst such teaching strategies are the use of: concept and mind mapping techniques; problem-based learning approaches; and case studies in understanding integrated real world issues and examples. Constructing concept and mind maps help students understand the linkages between concepts and ideas and their relationship with other interdisciplinary nowledge bases (the multiple intelligences of nvironmental science). It promotes the development and abilities of students to integrate a range of scientific nowledge, facts and theories which may be drawn from a range of different but inter-related disciplines. The use of roblem-based learning and of case studies focuses on providing students with the opportunity to become active and collaborative learners as they engage with real problems which may or may not have clear cut answers and with real world examples of how such problems have been approached and solved, or partially solved, in the past. Such approaches intend to develop student's inquiry and creative abilities, and inform and instruct students about how to learn and to study environmental science in the future, i.e., to provide and develop lifelong learning skills.

In order to improve the quality of environmental education in Azerbaijan schools, future teachers could usefully incorporate the use of concept and mind maps in teaching their courses. This approach can significantly assist the student's learning process towards: (a) sense-making; (b) the ability to add and synthesise new information within existing knowledge structures; and (c) adjusting prior understandings to new experiences.

So constructivist pedagogy necessitates respecting students' ways of learning and incorporating them into the educational processes we utilise. By using concept and mind mapping methods, the students' active and collaborative learning approaches are emphasised, and their skills of sense making and knowledge integration within a multi-disciplinary subject are developed. By using PBL in association with case studies, the

student's learning curiosity is engaged, they are more motivated to identify the concepts and principles. The skills of acquiring, communicating, organizing information and writing abilities were also developed. In active and collaborative learning settings, the roles of the teachers have been changed, teachers become the guiders or collaborators in the students' learning, i.e. they play the roles as 'guide on the side' not 'sage on the stage'. The constructivist teaching models, if used in the teaching of environmental science, can give the students a broader perspective on the ways in which the different aspects of our human environment interact with each other, and provide the student with the relevant skills and abilities to become the effective environmental managers of the future which are so urgently needed.

Rederence

[1] Cannella, G. S., & Reiff, J. C. (1994). Individual constructivist teacher education: Teachers as empowered learners. Teacher education quarterly 21(3), 27-38. EJ 498 429

[2] GiolitteP, Mathot L, Pardo A, and Vergnes G, 1997, Environmental Education in the European Union. Brussels,Luxembourg: ECSC- EC-EAEC.

[3] KlimovA.V. and UkolovA.I. 1994. The problems of the development of the universal system of ecological education. Ed.V.E.Nekos, V.I.Astakhovaet al. 57-58, Kharkov, Ukraine, Kharkov State University

[4] Lucas, C. J. (1994). *American higher education : A history / christopher J. lucas*. New York : St. Martin's Press.

[5] MacKinnon, A., & Scarff-Seatter, C. (1997). Constructivism: Contradictions and confusion in teacher education. In V. Richardson (Ed.), Constructivist teacher education: building new understandings (pp.38-55). Washington, DC: Falmer Press.

[6] Palmer, J. A. (1996) . Environmental cognition: early ideas and misconseptions at the ages of four and six. Environmental Education Research 23(4): 213-221

[7] Richardson, V. (1997). Constructivist teaching and teacher education: Theory and practice. In V. Richardson (Ed.), Constructivist teacher education: building new understandings (pp. 3-14). Washington, DC: Falmer Press.

[8] Yager, R. E. (1991). The constructivist- learning Model. The science Teacher, 51, 52-57.

[9] Uzzel,D. (1999). Education for environmental action in community: new roles and relationships. Cambridge Journal of Education, 29(3):397-414

[10] Sterling, S and Cooper G, 1992.In touch: environmental education for Europe, Surrey, UK:WWF, Panda House

[11] Teets, S. T., & Starnes, B. A. (1996). Foxfire: Constructivism for teachers and learners. action in teacher education 18(2), 31-39. EJ 536 844