



RESEARCH ARTICLE

Interdisciplinary training of creativity basis to the students of medical sciences in the country

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Abstract

Introduction: Teaching the basics of creativity to the students, as one of the most important goals of our education system, should be considered a priority in the curricula of each university, especially the universities of medical sciences. Considering the importance of this subject in the country's improvement and sustainable development, it was decided to take some steps to achieve this lofty goal and interdisciplinary and trans-disciplinary sciences establishment at their true position with the inclusion of creativity training to students as the 2nd short-time summer school in the Medical Education Development Center, Shiraz University of Medical Sciences.

Materials and Methods: To assess this period, two issues were important for the authorities: 1. The quality of education and the performance of this period 2. The rate of improvement during the period. For checking the quality of education of this summer school course, two types of questionnaire were designed for the survey of students in this regard and to measure the amount of students' learning of the concepts of creativity in this period, the portfolio was used. The validity of survey forms and electronic portfolios were studied by the experts of Medical Education Development Center and the reliability of forms were also checked after a pilot study and Cronbach's alpha coefficient $\alpha = 78\%$. The data were analyzed by excel software and spss.v14.

Results: 93 students with all fields of medical sciences from 44 Universities of Medical Sciences of the country have participated in the course that 43 of them were males and 50 were females. The mean age of them was 21.3, with a minimum age of 18 years and the maximum of 26 years. A total of 15 workshops were held with 7 different titles in the field of teaching creativity basics. Analyzing the results of the survey in workshops showed that the students mentioned the workshop of creativity in medicine as the best organized workshops and the results of the portfolios also confirmed that understanding the information of workshops and the quality of comprehension of lessons in these workshops were at a high level.

Conclusion: The results of this study show that the creativity training is effective and useful in terms of increasing the knowledge, awareness and students' skill. It also seems that using the educational portfolios are suitable tools for measuring students' learning over the time and it can guide the teachers and educational authorities in achieving the courses' educational goals; So, according to the effectiveness of the program, It is recommended to hold them again, allocate the resources and continue its expansion in other universities.

Keywords: Creativity, creativity training, interdisciplinary training, students, portfolio.

Introduction

The today's world is changing at a tremendous speed, rapid change and credit loose of new information is one of the characteristics of this era; therefore, the current issues and the future of a nation can no longer be solved by oil solutions [1].

Therefore, the most common definition of creativity is to generating ideas, approaches and authentic, innovative and new concepts which have adaptive behaviors. In fact, fostering creative people is the highest goal countries at the

plan of the educational system of each country. The future generation of all countries should be trained so that they can respond to the changes in the environment and turbulent society of the future [1].

Thus, the university teachers should apply very different ways to teach, in comparison to the ways in which they have been trained, which means that the students are actively involved in the learning process and thinking [2]. Because they are considered as the most precious asset of the country with such creative thoughts [3].

The universities have a special freedom in developing the new ideas, and participating in the creation of new knowledge. The universities also have a significant role in developing dynamic quality of their students, and this quality allows them to act with the critical power independently at least in their professional life and be able to deal with the special conditions or at least anomalies [3].

Unfortunately in today's universities and higher education institutions, instead of active teaching methods to enhance the students' ability to think, they focus on information transfer to the learners that just results in improving the memory and filling the mind [5]. According to the needs of today's society to the thinkers and creative people, the active and creative teaching methods and innovative education should be applied for the students more than before [2].

Having creativity is a prerequisite for their educational and research effectiveness in teaching creativity to the students [4]. In fact, the creativity is the willingness and enthusiasm to make that exists potentially in all people and all ages. In other words, the capacity is the capacity of seeing the new relationships and creating unusual ideas and being away from traditional patterns of thinking [6].

Torrance Also, in a study presented in 1962, defined creativity as: a successful step in shortages, re-combining the ideas and seeing the relationship between things and sensitivity to issues of shortages, human problems and gaps [7].

In the past, it was believed that the creativity is a gift of God and not something that can be raised or transferred to others, but now the scientists believe that the creativity is not an attribute that is belonged to a few people, but all humans have it and almost everyone can be more creative and have a better life together [8].

Considering the importance of this issue in the change and sustainable development, the experts of Shiraz University of Medical Sciences decided to incorporate creativity training to the students in the form of the 2nd short-term summer school in order to achieve this goal and establish the interdisciplinary and trans-disciplinary sciences in its rightful place, as well as recognizing the role and importance of them to the academic community. As in our religious books and moral teachings the importance of being creative and innovative individuals has been noted; the educational instructors of the course, planned to teach the principles of creativity based on the religious thoughts.

Although the creativity training has strong evidence abroad, this issue has theoretical background and enough research in the country. The historical review of this issue

shows that during the 1950s, there was a strong interest in relation to the training and boosting creativity. It was assumed that the personality and creative minds can be shaped by education. In 1950, a range of measures to stimulate creativity were done, but there were no planned or controlled program at the time. In fact, the 1980 activities should be considered as the initial plans which were responsible for encouraging creativity training programs, as the experts accepted that creativity can be accelerated training to help people find or create the frame of a new human life. Torrance 1974 in this regard, believed that although the creativity has personal dimension, it can be taught. Rickards 1988 believes that the creativity can grow develop via education [9-12].

Also Asadzadeh considered the important role of creative and innovative individuals in universities and other educational centers, because these centers are responsible for the education of committed and professional labor to all agencies and departments [13]. Kingle in his study in 1995 considered the university as the base of creativity and innovation, according to his study the creative university is an educational place to produce and improve the quality of the knowledge [14].

Methods

The original idea of implementing the short-term interdisciplinary course, for the first time was introduced in 1386 in the form of an outline in the Education Development Center, Shiraz University of Medical Sciences [15] and after a comprehensive study, the possible implementation of its aims and general scheme of the project were drawn. After a lot of discussion in numerous meetings on the scientific and theoretical aspects of the project and the creation of a committee consisting of experts and specialists, the missions and objectives of the program were determined and each of the committee members took the responsibility of a part of the academic and executive plans. Next, they discussed the topics of training courses of creativity in each of these different educational sub-groups. After determining the approved topics, the details of the educational content prepared in consultation and supervision of the experts of the fields, and the schedule of the plan was announced. The Successful implementation of the project in the form of the first summer school at the University of Medical Sciences, paving the way for the implementation of this plan in the next years [15].

The experience gained from the first implementation of this plan and identifying the strengths and weaknesses were Guidelines for the implementation of this plan. In

this period teachers emphasized on using the portfolios [16]. The portfolios as tools of intra-professional learning and assessing use to monitor the students' improvement progress and demonstrate his ability and learning process over the time and can be used in a particular subject, such as creativity, and cover all the learning of the individual in the time of the summer school. In fact, the portfolio is a tool to document student learning over the passage of time [16].

The educational content of this course was taught in the form of different workshops. In these workshops, working in small groups, education based on problem-solving and etc. were done. During these workshops, the film screening, group work and so on were used for the transmission of the educational concepts. Also in these workshops, the engagement and active participation of the participants was emphasized in the form of working in small groups.

On the sidelines of implementing the training course, recreational and sports programs included visiting the natural touristy and cultural attractions of the city were considered for each of the participants.

To measure the student learning of the concepts of creativity in this period, the portfolio was used. The electric portfolios were used by professors and a group of experts and representatives of the Center of Medical Education Development for assessing the students. The main idea of using portfolios for evaluation of the students, was that they knew that the portfolio as a factor in maximizing student learning, because the students by using it after holding each workshop acquired awareness and knowledge of continuous learning in this field [16]. The portfolios include 4 main parts. The first part was a table that covered the 5 key points that were learned in each workshop from the perspective of the student, according to his learning method and his understanding of the amount of the learning. The second part examines the strengths and weaknesses of each workshop in the format of two open questions, and the third part was a table that considered the students comments on understanding the content and the quality of expressing what he had learned, in the form of two questions, with a range of 5 options of Likert scale containing (excellent, good, fair, poor and very poor); However, since using the 3-point Likert method was more simple for the participants, according to the viewpoint of the Statistics Advisor of the University, it was decided that the 3-option Likert containing (poor, fair, good) is used, and the extra-curriculum activities carried out for the students in order to better understanding were reported by them. In the 4th step, any task or document which were related to the portfolio's subject were attached.

The validity of survey forms and electronic portfolios were studied based on the experts of Development Center of Medical Education view, and the reliability of the form also checked after the pilot study and Cronbach's alpha coefficient $\alpha = 78\%$. After entering the data in excel software, they were analyzed by spss.v14.

Results

93 students from 44 universities of medical sciences of the country took part in the course of which 43 were male and 50 were female. The mean age of participants was 21.3, with a minimum age of 18 years and maximum 26 years. 62.5% were medical students and the rest were from other disciplines of medical sciences. 155 students from the University of Shiraz and 78 student representatives from 44 universities were participating. Title of workshops and number of workshops in each topic show in [Table 1].

Table 1. Title of workshops and number of workshops in each topic.

Number of workshop	Topic
1	Concepts of creativity
1	Creativity and innovation
2	Creativity techniques
3	Critical thinking
3	Creativity based on religious teachings
3	Habits of highly effective and creative people 7
2	Creativity in medical sciences

For example: The first workshop, attended by guest professors on the subject of creativity and innovation, with initiatives and discussions on topics as varied as creative thinking skills, the importance of creativity in the knowledge era, lateral thinking, saying Dr. Debonu theory of in knowledge management (Six Thinking Hats), Medici effect and the impact of health managers on creativity and the relationship between entrepreneurship and innovation, or the workshop of critical thinking that was carried out by the presence of one of the university professors with subjects such as the concept of critical thinking, critical thinking standards in seven separate sections, Watson-Glazer's theory about the 5 principles of critical thinking, describes the characteristics of people with critical thinking and the close relationship of critics with the medical profession and introducing a book of the same name.

In general, students' opinions about the first 5 days of the second summer school workshops are as follows [Figure 1].

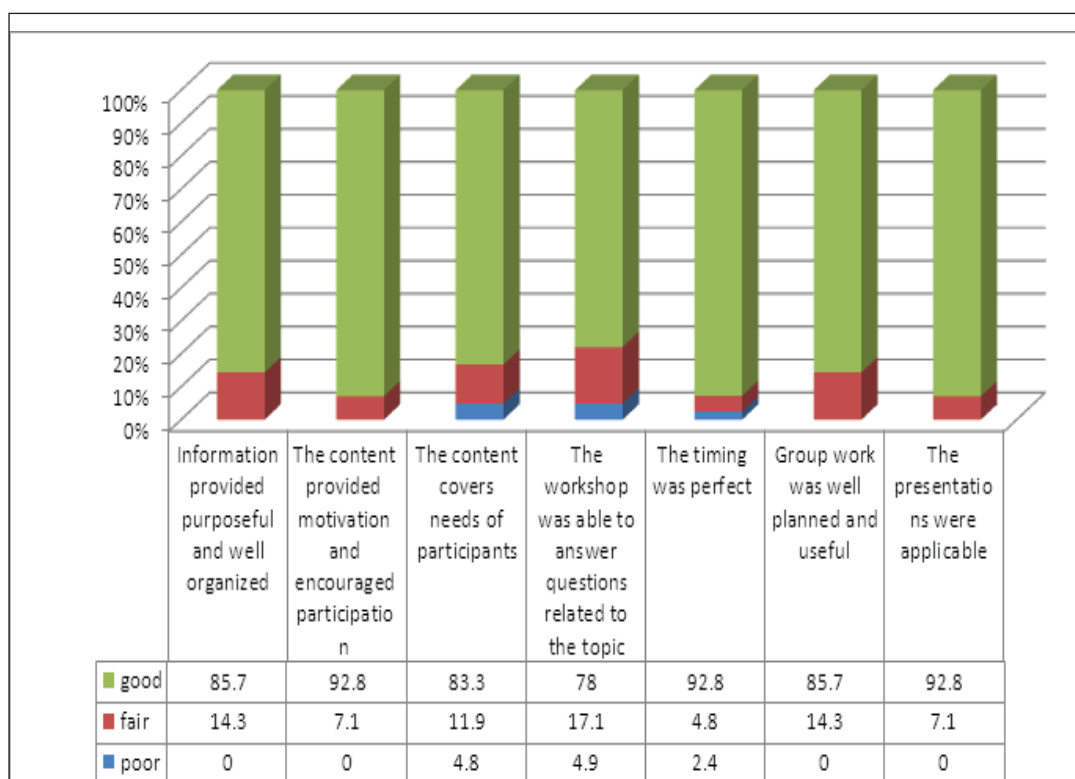


Figure 1. student opinions about creativity workshops.

This topic was taught in Shiraz University of Medical Sciences in the form of different workshops that the results of a survey of students' final examination and analysis of students' electronic portfolios showed that the status of this summer school in teaching creativity to the students has been considered very well. The survey of students' evaluation of the course results show that having respect for the learners and the on time presence of teachers in workshops has the highest score. Also the results of students' final exam showed that the highest students' scores were related to the workshop of training the concept and creativity techniques, and the workshop of innovation and creativity in medicine. The workshop was attracting more attention to students attending the course and it seems that this is due to interesting discussions in religious books.

On the other hand, the portfolio analysis revealed that almost 75% of mentioned key points has been consistent with the workshop holders' goals. About half of the students to better understanding of the contents using the supplementary methods such as searching the Internet, and related articles ... and presented the documents in portfolios. Students' comprehension of the workshops has been very good (98.2%), so that students report the understanding of the course content at a high or very high level. The quality of expressing the lessons in the workshop also has been reported to be good by the students [91.4].

In the task presenting step, the quality and relationship of tasks with the group work were considered suitable. For

example, in an assignment entitled using the creativity skills in professions, the students noted: for example in the field of medicine, attractive shapes can be designed for children in order to reduce the fear of syringes and blood bags. Devices such as MRI should be designed in a way that arising the curiosity of people, for nesting the tooth brushing in children for entering. In the dental profession: the institutionalization of children, illustrate the brush or floss in the food packaging or ice creams.

What's more, the mean score of the administrators and teachers of this course was 19.49 which are unique.

Discussion

Summer school courses of Shiraz University of Medical Sciences is a place where has the responsibility for the preparation outstanding and talented students of the country, who have successfully passed multiple tests, in order to improve their general skills and do better in the future in their professional responsibilities. The course also aims to help students with academic failure and boosting their motivation to be held in some areas [15].

For example, at Harvard University, annual summer schools are held in the 5 areas of art, anthropology and sociology, professional ethics, foreign languages and literature, paper writing and mathematics, computer and information technology with the presence of interested students of different countries during the morning and evening, with the participation of competent teachers and

experts [16, 17].

Or in summer school at the University of Cambridge, 4 domains of literature, history, art and medicine over three weeks, with a capacity of 50 students featured in each issue in the form of different workshops will be held during the week [18].

Since higher education in all societies is the main factor in the development of society, universities as executive agents of higher education have an important role in the country's human resources development [12]. With flourishing the potential talents and abilities of students also play a major role in the independence and eliminating any country's dependence on the countries and communities who don't have creative people stay weak and they cannot have an active role in the development of political, economic and cultural society and the improving international community [1]. So, the creative education of students through the education will lead to the creative human resources and these creative individuals due to having a desirable personality traits such as self-esteem, independence of thought, innovation and such characteristics they have made inside themselves will be effective in solving many social problems in their community and thus not only can prevent deterioration of their society in the present world, but also pave the way of achieving the human development.

Soriano, taking advantage of a great symbolic example, speaks of the creativity importance for the future of the community. He compared the literacy with the creativity: Until a couple of centuries ago, only a few people had the ability to read and write and it was a general belief that reading and writing skills could be learnt by a minority of people. Now, there is a similar believe about creativity. This means that although now people believe that only a few people have the ability of the creativity, but soon a day will come when all people have the natural right of learning creativity and innovation and it will be remembered as a necessity for human life [17]. Given that many studies show that there are rare people who are highly creative and this talent and ability is common among all people and it is normally divided. Thus, the presence of individuals who have the inherent ability to be creative do not worry us and it's important for them to be strengthened in universities, environment and the necessary facilities for the growth should be provided [18].

This means that, even though the creative thinking ability is innate in human beings, its emergence requires education in academic institutes and universities [19].

Different studies have shown that 98% of children have high creativity, but as soon as they go to school it reduces and until the age of 12, the number of creative people lessens [21]. Therefore, the inclusion of creativity in the curriculum of the university students is highly important to

reconstruct this concept and help them to use it in their future professions. Here, we give a solution to the problem of the kind of creativity training to this group of people to increase the effectiveness of learning.

In one of the studies with the presence of 152 US educational system curriculum planners, 2% of planners believed that creative thinking can be fostered through regular educational system and 87% of planners believed to have a suitable schedule of some methods such as workshops, the question and collaborative arguments, research groups, and learning based on solution making to develop creative thinking [22, 23].

Another point in the portfolios analysis was the strengths and weaknesses. The students of this course considered the structured awareness and interdisciplinary sciences, increasing the communication and interaction among the students and sharing their experiences, having no time limit to submit portfolios and covering their needs as the major strengths and the limitations of the number of the participants, not having a plan to invite of distinguished professors from around the country, problems of uploading the text of the portfolio from the blog due to the limited speed of the Internet, uncertainty of reaching the corresponding liability as weaknesses raised in this period.

One of the significant and interesting issues of this study was students' interaction with each other and also teachers during the course. This can be seen in abundance in the portfolio notes of the students that showed a suitable learning environment for teaching creativity principals.

Conclusion

Shiraz interdisciplinary summer school courses with an emphasis on teaching creativity have had a great role in education the key concepts. With respect to the public education and the results of this study, it seems that the principles of creativity is learnable for students and training the creativity skills can increase the knowledge, awareness and students' skills. It also seems that using the educational portfolios is a good tool for measuring of student learning over the time and can guides the teachers and educational authorities in achieving the educational goals of the school; It is recommended that mentioning the effectiveness of the program in improving students' abilities, planning, resource allocation and the support of academic managers in the continuation of the program and its development should be considered in other universities.

Recommendations

- Continuous training of creativity in different groups and levels of students.
- Offering suitable scenarios related to different groups of students and various work groups in order to better teach

the concepts of creativity.

Conflicts of Interest

There are no conflicts to declare.

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