



**Original Article**

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## Assessing the Ways of Improving the Industrial Power and Auto Mechanic Training Programs in Technical and Vocational Training Centers of Mazandaran Province

Maryam Talebian Darzi<sup>1\*</sup>, Mohammad Hasan Amirteimouri<sup>2</sup>

*1\* PhD student in Curriculum, Department of Educational Sciences, Sari Branch, Islamic Azad University, Sari, Iran. (Corresponding Author) Email: [Maryam\\_talebian\\_d@yahoo.com](mailto:Maryam_talebian_d@yahoo.com)*

*2 Faculty members, Faculty of Psychology and Educational Technology, Allameh Tabatabai University, Tehran, Iran.*

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**ABSTRACT:** Broadly speaking, education has a key role people's growth and development, and as we have frequently heard, "education is at the heart of development." Today, man's knowledge, skills, and proficiency are increasingly gaining momentum as major contributors to the world economy. Present research attempts to find out how possibly certain training courses held in the Technical and Vocational Training Centers of Mazandaran province could be improved. This is, in fact, an applied research which was conducted based on a descriptive survey design where the required data was gathered through field study using questionnaire as well as the existing documented sources. The statistical population and sample included 3 groups of the addressee involved in the above mentioned training courses, in particular, 56 graduated trainees and 6 trainers from the training course industrial power (the 18-month program), and 65 graduated trainees and 2 trainers from the training course auto mechanic. The obtained information from the question with regard to the training programs from the perspective the graduated trainees, trainers of industrial power and auto mechanic was assessed using descriptive analysis. The assessment in the above three groups was designed according to the quality indices of each group, respectively, with 10 indices for the former trainees and 9 indices for the trainers of the two courses. And the results of the eventual data analysis were outlined in tables and diagrams.

**KEYWORDS:** quality improvement, training quality, training program, technical training centers

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## **1. INTRODUCTION**

Today, people's knowledge, skills, and proficiency play an increasingly major role in the world economy. With the growing importance hereof, it is heavily invested in human capital, especially through technical and vocational training centers, in order to enhance the workforce quality. Because it has become the common belief that this type of education is a useful good and service from having which both individuals and society can derive profit. Up until 1950, the fact that people may have different abilities had no significant place in economic analysis. It was after 1950 when the qualitative changes in the workforce began to find prominence in economic analyses. Famous economists such as Theodore Schultz (1961, 1981, 1987), Gary Baker (1964, 1967, 1975), and Sakharopus (1995) specifically underpinned the subject in several occasions. The role of education, however, lies in the effect that it leaves on human resources and this impact drives the economic growth. This factor is referred to as "human capital" (Fattahi, 1998).

The positive relationship between human capital, expressed as knowledge, and economic growth and development enjoyed the support of Adam Smith, the founder and father of the economics, and quite interestingly, around 1960s the human capital theory once again was revived by two Nobel Laureates in economics, Schultz and Baker, as well as by Miner, each independently proposing a model of human capital (Jamshidi, 1995).

The emergence of the modern and changing labor market condition causes different countries at different points of time to demand well-trained and skilled workforce for various segments in keeping up with knowledge and technology advances. Appropriate and logical response to the labor market changing demands is a responsibility of educational and training institutes and organizations that are to fulfill the mission of preparing people for adaptation concordance with new condition. In the modern management systems, managers want to make sure that each activity is carried out effectively. Since training involves different processes, supervision over performance of each process as a subsystem is necessary. Training is mainly a qualitative activity and its quantification is difficult and at times impossible. Thus, managers and involved people in education and training areas should primarily focus on quality of training. Quality in different areas has different meaning and implications, but in training, which is of high importance, depends on human and his behavioral states (Makkian, 2005). Training executives, in design and planning of training processes and their implementation, should pay particular attention to the output or the very training outcome.

The first-degree auto mechanic and the 18-month industrial power programs in the mentioned technical and vocational training centers, which are aimed to produce skilled workers, are among the branches designed and created based on the real needs in the society. Due to the necessity of the skilled workforce training for attaining the goal of industrial self-sufficiency, in this study, the training processes and their outcomes were examined in terms of the quality indices in order that based on the gathered information better solutions are provided for improvement of the mentioned training programs.

## **2. Research theoretical background**

In the world today, human resources has a special place to the degree that it could be argued that the most effective and the most valuable factor in every restructuring, development, transformation, and



evolutionary plan are the skilled people whose quality and quantity has significant impact on a country development and reconstruction strategy. The topic “human is at the very most center of economy” has been welcomed worldwide, so as all countries by understanding it are making effort to optimize their human resources and become equipped with the weapon of quality skill. Therefore, in each development plan, it is important that the country’s workforce has the necessary skill, knowledge and insight for effective management of its respective profession in order to assist the society and the country in accomplishment of its goals and development plans (Abdi, 2005).

A type of training that in this regard could have a decisive role in producing specialized and efficient workforce and thereby contribute to progress and development of a country is the training provided by technical training centers. Human resources development can take place both in formal schooling and collaborative institutes. Of course, it should be specified which of the technical and vocational skills are to be provided at schools and which ones in collaborative training organizations. Considering that technical and vocational training services are necessarily expensive, government should allocate adequate capital resources to them, because from poor investment one cannot expect any significant result (Ahmadi, 2005).

Harvey (1995) proposes five perspectives regarding the quality in higher education which arguably could be extended to other study programs. These perspectives are:

1. Exceptional: Harvey defines quality a synonym to competence which could be achieved only by an expert.
2. Perfection or consistency: this perspective describes quality in terms of consistent and flawless outcomes.
3. Fitness for purpose: in this view, quality is responsiveness to the consumer’s needs
4. Value of money: from this perspective, quality is the money value by return of investment.
5. Transformation: it views quality as a change (or shift) from one state to another (Abdi, 2005: 63).

It is noteworthy that some of these views or a combination of them may be particularly efficient and effective. At any rate, the part of the quality concepts and fundamental ideas that results in greater productivity and benefit has been reflected on by the thinkers and theoreticians of education system and methodically treated under the topic of total quality management (TQM) giving rise to plenty of organized works and sources in education system. With the above mentioned organized sources, one may evaluate quality improvement of one’s own training institute based on three perspectives of compliance, collectivism, and individualism as follows:

- According to the consistency perspective, the training institute is evaluated based on its consistency with vocational international and national norms, standards, and research indicators in the respective training (program).
- From the perspective of collectivism, quality is measured based on the extent to which a training institute is committed to society for providing services and is engaged in meeting the important demands of society and people.
- In the individualist perspective, quality of training institutes is appraised based on the level of their collaboration and providing learning experiences and contributions to individual



development of learners and teachers. In this process, learning degree itself is regarded a reference for quality assessment.

This three-dimensional model of quality can be instrumental to quality improvement in different respects, and educational institutes are required to specify their scientific position and movement in each of the three quality dimensions (Ghorchian, quoting from Abdi, 2005: 64).

According to Pardakhtchi, quality in education system is the degree to which the taught and learned materials are in keeping with the present and future needs of learners, given their specific condition and prospects (Pardakhtchi, quoting from Abdi, 2005).

The international network of the quality guarantee institutions defines quality as conformity of the education state with the set standards, mission, goal and expectations (Mashinchi, quoting from Abdi, 2005).

Badri Shahtalabi, in his research titled Effectiveness of the First- and Second-Degree Auto mechanic Training Courses in Five Cities of Esfahan, Kashan, Mobarekeh, Najafabad, and Shahreza, reported a low and a very low level of modern technology use according to 72.5 percent of the respondent trainees. Mohammad Hossein Mirza Mohammadi (2004) investigated the employees' educational needs in the technical and vocational training centers of Tehran province found that of the total number of the understudy people sampled from the statistical population, 13.2% were in public institutes, 33.5% in the private sector, 0.3% in cooperatives, 3/7% individually, 0.8% in other segments, and 49.5% did not specified the state of their institute.

Sunilson, Eding, and Elvin (1961), quoted by Makkian (2005), in a large scale study in 21 countries, showed that there was a direct relationship between economic growth and Education development, especially at high school and university levels, and economic poverty and (poor) education are interdependent. Pikius and Watanab (2002) investigated the progress course of the technical and vocational training in Asian countries. They found the following solutions for development and desirable quality of technical and vocational training in developing countries. Cello, quoted by Makkian, from the calculation of the US national income between 1909 and 1949 drew the conclusion that 78.5 percent increase of the per capita income could not be attributed to the known production factors, i.e. labor, capital, and raw material, but a result of progress in knowledge and technology level.

### **3. Research methodology**

This is an applied research conducted according to a descriptive survey design. The statistical population of this research consisted of the trainees and the trainers of the training programs industrial power (the 18-month program) and the first-degree auto mechanic from the technical and vocational training centers of Mazandaran province, whose views was used by the research in assessing quality of the training programs. In the training program industrial power, 56 graduated trainees and 6 present trainers, and in the training program auto mechanic, 65 graduated trainees and 2 present trainers, as well as 7 of the current employers of the trainees working now in different companies and factories formed the respondents of the survey. The required actual data was gathered using the questionnaire of trainees,



employers and trainers. To examine the questionnaire’s content validity, the face validity method was used. Hence, the prepared questionnaire was handed to a group of university professors and academic experts who after making the necessary corrections and nuances to the questionnaire’s items approved the questions validity. The questionnaire’s reliability was verified using Cronbach’s alpha. The obtained alpha coefficients for the trainee index ( $r = 0.941$ ), the employer index ( $r = 0.956$ ), and the trainer index ( $r = 0.954$ ) indicated a rather high degree of internal consistency for all three indices. The data analysis was performed in SPSS environment.

### 3.1. Research questions

1. How is the current quality state of the training programs first-degree auto mechanic in the technical and vocational training centers of Mazandaran province?
2. How is the current quality state of the training programs industrial power (the 18-month program) in the technical and vocational training centers of Mazandaran province?
3. In what ways the quality of the training program first-degree auto mechanic in the mentioned training centers could be improved?
4. In what ways the quality of the training program industrial power (the 18-month program) in the mentioned training centers could be improved?

## 4. Findings

### Analysis of the obtained data from the trainees of industrial power (the 18-month program)

#### The first index: the program desirability in terms of goals, educational standard and content

Now, given that this index has a maximum score of 55 and a minimum score of 11, the ranges are divided into undesirable (11 to 25.66), relatively desirable (25.66 to 40.32), and desirable (40/33 to 55).

**Table 1.** Program desirability

N	Valid	52
	Missing	0
Mean		36.13
Median		37.00
Mode		37
Variance		32.982
Range		26
Minimum		22
Maximum		48

In the frequency table above (table1), it is seen that mean value 36.13 lies within the relatively desirable range. That is to say, in view of the trainees, the program is relatively desirable.



**Second index: trainee capability**

Considering that this index is with maximum 45 scores and minimum 9 scores, the ranges could be divided into undesirable (9 to 21), relatively desirable (21 to 33), and desirable (33 to 45).

In the frequency table below (table2), it is seen that mean value 31.02 falls within the relatively desirable range, implying that from the perspective of the trainees, capability is at a relatively desirable level.

**Table 2.** Trainee capability

N	Valid	52
	Missing	0
Mean		31.02
Median		31.00
Mode		31
Variance		31.980
Range		27
Minimum		15
Maximum		42

**Third index: consistency with the present and the future developments**

Since this index takes on a maximum score of 40 and a minimum score of 8, the ranges are divided into undesirable (8 to 18.66), relatively desirable (18.66 to 29.33), and desirable (29.33 to 40).

**Table 3.** Consistency with the present and the future developments

N	Valid	52
	Missing	0
Mean		19.92
Median		20.00
Mode		18 <sup>a</sup>
Variance		18.033
Range		21
Minimum		10
Maximum		31

In the frequency table above (table3), it is seen that mean value 19.92 falls within the relatively desirable range, meaning that from the trainee’s perspective, the index consistency with the present and future developments is relatively desirable.



**Fourth index: desirability of equipment and space**

Now, considering that this index assumes a maximum score of 35 and a minimum score of 7, the ranges then could be divided into undesirable (7 to 16.33), relatively desirable (16.33 to 25.66), and desirable (25.66 to 35).

**Table4.** Desirability of equipment and space

N	Valid	52
	Missing	0
Mean		21.65
Median		21.50
Mode		20
Std. Deviation		4.242
Variance		17.995
Range		17
Minimum		11
Maximum		28

As is seen in the frequency table above (table4), mean value 21.65 lies within the relatively desirable range, which means according to the trainees, the training equipment and space is at a relatively desirable state.

**Fifth index: time desirability**

Now, given that the index has a maximum score of 15 and a minimum score of 3, the ranges are divided into undesirable (3 to 7), relatively desirable (7 to 11), and desirable (11 to 15).

**Table5.** Time desirability

N	Valid	52
	Missing	0
Mean		10.71
Median		11.00
Mode		10
Variance		3.386
Range		8
Minimum		7
Maximum		15

As we see in the frequency table above (table5), mean value of 10.71 lies in the relatively desirable range. That is to say, in view of the trainees, the time schedule is at a desirable level.



**Sixth index: desirability of teaching methods and the program training skills**

Since this index takes on a maximum score of 35 and a minimum score of 7, the ranges are divided into undesirable (7 to 16.33), relatively desirable (16.33 to 25.66), and desirable (25.66 to 35).

**Table6.** Desirability of teaching skills and the program training skills

N	Valid	52
	Missing	0
Mean		21.50
Median		21.00
Mode		22
Variance		24.647
Range		22
Minimum		13
Maximum		35

In the above frequency table (table6), it is seen that mean value 21.5 falls within the relatively desirable range, which means that according to the trainees, the index teaching methods and the program training skills is relatively desirable.

**Seventh index: desirability of technical specialization**

Now, given that the index is graded with a minimum score of 4 and a maximum score of 20, the total range is divided into undesirable (from 4 up to 9.33), relatively desirable (from 9.33 up to 14.66), and desirable (from 14.66 up to 20) ranges.

As is evident from the frequency table below (table7), the mean value 12.83 falls within the relatively desirable range, that is, from the perspective of the trainees, the trainers' technical specialization and teaching quality are relatively desirable.

**Table7.** Desirability of trainers' technical specialization and teaching quality

N	Valid	52
	Missing	0
Mean		12.83
Median		13.00
Mode		10
Variance		10.577
Range		14
Minimum		6
Maximum		20





**Eighth index: desirability of comfort and other peripheral issues**

Since this index assumes a maximum score of 15 and a minimum score of 3, the entire range is divided into undesirable (3 to 7), relatively desirable (7 to 11), and desirable (11 to 15) ranges.

**Table8.** Desirability of comfort and peripheral issues

N	Valid	52
	Missing	0
Mean		6.42
Median		6.00
Mode		6
Variance		6.406
Range		10
Minimum		3
Maximum		13

As is seen from the frequency table above (table8), mean value 6.42 falls within the undesirable range. That is to say, from the perspective of the trainees, the current state of the comfort-related and other peripheral issues is undesirable.

**Analysis of the obtained data from the trainers**

**First index: program desirability in terms of goals, training standards, and content**

Now, given that this index has a maximum score of 75 and a minimum score of 15, the ranges are divided into undesirable (15 to 35), relatively desirable (35 to 55), and desirable (55 to 75).

**Table9.** Program desirability in terms of training goals, standard, and content

N	Valid	7
	Missing	0
Mean		55.57
Median		55.00
Mode		46 <sup>a</sup>
Std. Deviation		8.018
Variance		64.286
Range		23
Minimum		46
Maximum		69



In the frequency table above (table9), it is seen that mean value 55.57 lies within the desirable range. That is to say, in view of the trainers, the program is desirable.

**Second index: earlier preparation of trainers’ teaching program and capabilities**

Since this index takes on a maximum score of 35 and a minimum score of 7, the ranges are divided into undesirable (7 to 16.33), relatively desirable (16.33 to 25.66), and desirable (25.66 to 35).

In the frequency table below (table10), it is seen that mean value 22.29 falls within the relatively desirable range, which means that according to the trainers, earlier preparation and training of the trainers is relatively desirable.

**Table10.** Earlier preparation of trainer

N	Valid	7
	Missing	0
Mean		22.29
Median		22.00
Mode		16 <sup>a</sup>
Std. Deviation		5.251
Variance		27.571
Range		14
Minimum		16
Maximum		30

**Third index: consistency with the present and the future developments**

Since this index takes on a maximum score of 35 and a minimum score of 7, the ranges are divided into undesirable (7 to 16.33), relatively desirable (16.33 to 25.66), and desirable (25.66 to 35).

**Table11.** Consistency with the present and the future developments

N	Valid	7
	Missing	0
Mean		22.43
Median		22.00
Mode		20 <sup>a</sup>
Std. Deviation		2.936
Variance		8.619
Range		7
Minimum		19
Maximum		26

a. Multiple modes exist. The smallest value is shown



In the frequency table above (table11), it is seen that mean value 22.43 falls within the relatively desirable range, meaning that from the trainers’ perspective, the index consistency with the present and future developments is relatively desirable.

**Fourth index: desirability of teaching methods and trainer’s educational activities**

Since this index takes on a maximum score of 50 and a minimum score of 10, the ranges are divided into undesirable (10 to 23.33), relatively desirable (23.33 to 33.66), and desirable (33.66 to 50).

**Table12.** Desirability of teaching skills and the program training skills

N	Valid	7
	Missing	0
Mean		26.57
Median		26.00
Mode		26
Std. Deviation		3.409
Variance		11.619
Range		11
Minimum		21
Maximum		32

In the above frequency table (table12), it is seen that mean value 26.57 falls within the relatively desirable range, which means that according to the trainers, the index teaching methods and the program training skills is relatively desirable.

**Fifth index: desirability of equipment and space**

With inspection of the existing equipment according to the equipment list of industrial power (the 18-month program), it was seen that 80 percent of the equipment was present in the workshop in accordance with the standard. Now, considering that this index assumes a maximum score of 40 and a minimum score of 8, the ranges then could be divided into undesirable (8 to 18.66), relatively desirable (18.66 to 29.32), and desirable (29.32 to 40).

**Table13.** Desirability of equipment and space

N	Valid	7
	Missing	0
Mean		26.57
Median		26.00
Mode		26
Std. Deviation		3.409
Variance		11.619
Range		11
Minimum		21
Maximum		32



As is seen in the frequency table above (table13), mean value 26.57 lies within the relatively desirable range, which means according to the trainers, the training equipment and space is at a relatively desirable state.

**Sixth index: time desirability**

Now, given that the index has a maximum score of 15 and a minimum score of 3, the ranges are divided into undesirable (3 to 7), relatively desirable (7 to 11), and desirable (11 to 15).

**Table14.** Time desirability

N	Valid	7
	Missing	0
Mean		9.00
Median		9.00
Mode		10
Std. Deviation		1.155
Variance		1.333
Range		3
Minimum		7
Maximum		10

As we see in the frequency table above (table14), mean value of 9 lies in the relatively desirable range. That is to say, in view of the trainers, the time schedule is at a relatively desirable level.

**Seventh index: desirability of comfort issues and human relations**

Since this index assumes a maximum score of 20 and a minimum score of 4, the entire range is divided into undesirable (4 to 9.33), relatively desirable (9.33 to 14.66), and desirable (14.66 to 20) ranges.

**Table15.** Desirability of comfort and human relations

N	Valid	7
	Missing	0
Mean		10.43
Median		10.00
Mode		7 <sup>a</sup>
Std. Deviation		2.992
Variance		8.952
Range		9
Minimum		7
Maximum		16



As is seen from the frequency table above (table15), mean value 10.43 falls within the relatively desirable range. That is to say, from the perspective of the trainers, the current state of the comfort-related and other human relation issues is relatively desirable.

**Eighth index: trainee preparation**

Now, given that this index has a maximum score of 20 and a minimum score of 4, the ranges are divided into undesirable (4 to 9.33), relatively desirable (9.33 to 14.66), and desirable (14.66 to 20).

**Table16.** Trainee preparation

N	Valid	7
	Missing	0
Mean		11.86
Median		13.00
Mode		13
Std. Deviation		3.388
Variance		11.476
Range		11
Minimum		5
Maximum		16

In the frequency table above (table16), it is seen that mean value 11.86 lies within the relatively desirable range. That is to say, in view of the trainers, the trainer preparation is at a relatively desirable level.

**Ninth index: desirability of creating entrepreneurial spirit**

Now, given that the index has a maximum score of 15 and a minimum score of 3, the ranges are divided into undesirable (3 to 7), relatively desirable (7 to 11), and desirable (11 to 15).

**Table17.** Entrepreneurial and peripheral issues

N	Valid	7
	Missing	0
Mean		7.86
Median		7.00
Mode		7
Std. Deviation		3.185
Variance		10.143
Range		10
Minimum		3
Maximum		13



As we see in the frequency table above (table17), mean value of 7.86 lies in the relatively desirable range. That is to say, in view of the trainers, entrepreneurial spirit is at a relatively desirable level.

**Ninth index: trainee preparation**

Now, given that this index has a maximum score of 25 and a minimum score of 5, the ranges are divided into undesirable (5 to 11.66), relatively desirable (11.66 to 18.32), and desirable (18.32 to 25).

**Table18.** Trainee preparation

N	Valid	52
	Missing	0
Mean		17.12
Median		17.50
Mode		18
Variance		8.183
Range		12
Minimum		9
Maximum		21

In the frequency table above (table18), it is seen that mean value 17.12 lies within the relatively desirable range. That is to say, in view of the trainers, the trainer preparation is at a relatively desirable level.

**Tenth index: creating entrepreneurial spirit**

Now, given that the index has a maximum score of 10 and a minimum score of 2, the ranges are divided into undesirable (2 to 4.66), relatively desirable (4.66 to 7.32), and desirable (7.32 to 10).

**Table19.** Creating entrepreneurial spirit

N	Valid	52
	Missing	0
Mean		5.44
Median		6.00
Mode		6
Variance		2.957
Range		7
Minimum		2
Maximum		9

As we see in the frequency table above (table 19), mean value of 5.44 lies in the relatively desirable range. That is to say, in view of the trainers, entrepreneurial spirit is created at a relatively desirable level.



In addition, the use of different teaching methods by the trainers is as follows.

**Table20.** The use of different teaching method by trainers

Preferences Teaching methods	First	Second	Third	Fourth	Fifth
Lecture	67%	33%	-	-	-
Q&A	-	33%	50%	17%	
Experimental unit	33%	17%	-	33%	17%
Group discussion	-	17%	50%	17%	17%
Field trip	-	-	-	17%	83%

### 5. Discussion and conclusion

Human resources play undoubtedly a pivotal role in economic, social, and cultural development. No development process is ever known that needs not the human factor. Development of knowledge, skills, improvement of human skill quality, and transformation of human from an instrument into a capital in the development process have radically changed his personality and position, so as retention of human capitals in economic units and factories is viewed far more important than maintenance of physical capital and machinery. Each economic unit goes through a transformation process, and creativity and innovation in operation are of concern to its managers. Human resources are deemed one of the key resources and factors that primarily should be equipped with required skills for realization of innovation in the operation. In human resources development, however, technical and vocational training organization takes a special position in equipping the workforce with the necessary skill and technical know-how for performing job tasks and duties. In general, quality can be measured and assessed in two ways:

- a) Through examination at the end of the training program which represent conformity of the state of technical and vocational training with educational standards.
- b) By evaluating goals, missions, and expectations. Among the purposes of the technical and vocational training programs are:
  1. Making the employment available to unskilled people;
  2. Adaptation of the workforce’s skill with the emerging skills from technological changes; and
  3. Improving the workforce’s skill in order a higher productivity to be achieved.

As such, it is important that in all systems, including education system, the evaluation process to have comprehensive understanding of the whole system. Since evaluation, while clarifying the quality state of the system in question, identifies obstacles problems and helps the choice of appropriate options for quality improvement and consistently leads the entire system to the desired growth and excellence. Hence, a number of solutions with regard to the quality indices included in present research for improving the quality of the training programs industrial power (the 18-month program) and the first-degree auto mechanic are provided as follows:

- Since training programs do not solely concern economic issues, but also is related to social, cultural, historical, technical, and political parameters, the training goals, standard, content need



to be designed and composed for development of all economic, social, cultural, historical, technical, and political aspects;

- Trainees should be given the possibility of self-assessment, so as, while getting acquainted with the actual self-assessment procedure, they can gather the data on the quality of their training and research and eventually evaluate their training quality and come up with useful solution for its improvement;
- The skills required by transforming professions and industries could be identified through industrial consultation and using the research findings;
- Increase in the number of trainers in specialized sections of the technical and vocational training centers;
- Use of experienced trainers, competent experts with a university degree;
- Appropriate training planning based on the needs, interests, predisposition of different age groups.





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**AUTHOR (S) BIOSKETCHES**

**Maryam Talebian Darzi**

PhD student in Curriculum, Department of Educational Sciences, Sari Branch, Islamic Azad University, Sari, Iran.

**Mohammad Hasan Amirteimouri**

Faculty member, Faculty of Psychology and Educational Technology, Allameh Tabatabai University, Tehran, Iran



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#### **ETHICAL CONSIDERATION**

Authenticity of the texts, honesty and fidelity has been observed.

#### **AUTHOR CONTRIBUTIONS**

Maryam Talebian Darzi and Mohammad Hasan Amirteimouri contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

#### **CONFLICT OF INTEREST**

Author/s confirmed no conflict of interest.