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Investigating Teachers' Viewpoint about Challenges of Technical and Vocational Education

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ABSTRACT: One factor of sustainable development in countries is enjoying high quality vocational and technical education. The purpose of this study was to investigate the challenges of technical and vocational education in Urmia city, Iran, from the teachers' point of view based on four dimensions of contextual, input, process and output factors. In this regard, the research was conducted by survey method and the research population consisted of teachers of technical and vocational schools of Urmia in the academic year of 2018-2019, for which 266 individuals were randomly selected as samples. The research tool consisted of an online researcher-made questionnaire whose validity was assessed by the opinions of five experts and its reliability was affirmed through Cronbach's alpha test. Frequency and the one-sample t-test were used for data analysis. According to the results of the research, technical and vocational education is challenging in four dimensions of contextual, input, process and output factors, and to meet the challenges, it is essential that all individuals and institutions involved act in harmony and play a role according to their responsibilities and authorities.

Keywords: Technical and vocational education challenges, teachers' viewpoints, contextual factors, input factors, process factors, output factors.

Introduction

Knowledge is a key element in the information age. Formal and informal educational institutions have been created to achieve all kinds of knowledge (Bai & Wu, 2019). In order to teach practical subjects after the Industrial Revolution and in the early 19th century, the apprenticeship method of training skilled workers lost its effectiveness. With the advent of industry, the need for skilled manpower increased. These factors led to the emergence of technical and vocational education in societies (Wu & Ye, 2018). With the launch of Dar al-Fonoon, specialized schools were also developed in Iran along with regular schools (Baniameryan et al., 2017). Technical and vocational education in Iran operates at the education and higher education levels (Baghbanpourasl et al., 2017).

Technical and vocational education consists of vocational and technical training and work and knowledge (Behbahani, 2010). Technical and vocational education system, as one of the most important components of the Iranian education system, is responsible for training skilled and semi-skilled human resources at the pre-university level and intends to prepare individuals for the job market (Fard & Salimi, 2017).

According to the Organization for Economic Co-operation Development, different countries use three models of Fiszbein, full-time vocational education and apprenticeship based on their conditions. In the Fiszbein model, technical and vocational education is created in manufacturing centers and countries such as Japan and the United Kingdom use it. The full-time model also has a weak relationship with the

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labor market, with both theoretical and practical training being followed, and countries such as Spain, France and Iran follow this pattern. In the third model, technical and vocational education is followed in the industrial school and the labor market in combination. This model is used in countries such as Spain, Switzerland and Germany (Kilbrink et al., 2018). In addition to the recently mentioned patterns, technical and vocational education is evolving based on changes in new knowledge and technologies.

One of the new areas in technical and vocational education is the use of simulations and the implementation of electronic performance support systems (EPSS) (Rumney, 2019). Electronic performance support systems help individuals in their professional roles by making information and tools available for business performance such as online aids, smart systems and other electronic tools (Sezer & Simsek, 2018). According to UNESCO recommendations for the third millennium, countries need to develop technical and vocational education and provide it to the public in order to promote lifelong learning and achieve sustainable development (Choy et al., 2018); however, there are some challenges in the implementation such programs.

Baniameryan et al. (2017) conducted research entitled "comparative study of (formal and academic) technical and vocational curriculum with emphasis on entrepreneurial intention in Canada, Germany and India with Iran". Based on the results of the research, there was a significant gap between teaching and learning activities in selected countries and Iran. In Iran, traditional methods are more largely used in teaching, but the approach of selected countries is based on group methods. The selected countries use a variety of methods (evaluation boards, self-evaluation, and evaluation of learners' research projects) for evaluation, while in Iran the written and oral tests are mostly used.

Jalilyan et al. (2017) adapted the provided technical and vocational training to the needs of industrial sector in Khoramabad, Iran. The findings indicated a gap between technical and vocational education and the educational needs of the region

Bohlouli Faskhoudi et al. (2016) investigated the relationship between technical and vocational education with theoretical education in Iran. According to the research findings, one of the challenges of Iranian technical and vocational education is the separation of vocational education from university and the bipolarity of theoretical and practical education; however, the appropriate approach is to establish a balance between theoretical and practical training (Bohlouli Faskhoudi et al., 2016).

In another study by Parand et al. (2013), it was concluded that one of the most important reasons for the inactivity of the graduates of the Iranian educational system is the lack of labor market skills, which is due to many reasons, but one of the most important reasons is the lack of proper training patterns in this area. In fact, many technical and vocational education topics fall into the realm of practical issues; but, unfortunately, the correct way of teaching this kind of knowledge in the education community is not very well known and this causes the learners not to succeed in acquiring this type of knowledge

Lin (2019) in a study explored the challenges and opportunities of technical and vocational education in Taiwan's local communities. The research was descriptive and analytical based on qualitative and quantitative data (such as official documents, media coverage, scientific research, and policy analysis). The results indicated that investing in technical and professional skills could be an important factor in accelerating economic development; but there are challenges in this area, such as low technical and

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professional development, inadequate technical and professional status in the public mind, poor linkages between technical and vocational education and the labor market, and the lack of coordination of technical and vocational education with modern technological changes.

Haruna and Kamin (2019) in another study examined the challenges and strategies of work-based learning in technical and vocational education in Nigeria using a factor analysis approach. The research tool consisted of a structured questionnaire and the opinions of 385 respondents including 227 professors and 158 heads of technical and professional companies. Using factor analysis, the main components of the study were identified as: politics, budgets, attitudes and communication with challenging factors in Nigeria's vocational education and training. On the other hand, educational, administrative, institutional, and curriculum factors were identified as strategic factors for work-based learning effectiveness

Okumu and Bbaale (2019) conducted a study entitled "technical and vocational education in Uganda: a critical analysis". Quantitative and qualitative data were used in this study. Quantitative data were collected through a structured questionnaire and qualitative data were collected through ongoing surveys and site visits, focused individual interviews, and group discussions. According to research results, Uganda's technical and vocational education challenges include funding constraints, poor and inadequate equipment, weaknesses in empowerment of staff under training, inadequate curriculum, poor oversight, and legal uncertainties.

In fact, according to recent internal and external research, the challenges of technical and vocational education can encompass a different range of challenges that, if classified on a systematic basis, can be categorized into four contextual factors (such as the low status of technical and vocational education in the public mind), input factors (such as inadequate funding, weak student entrance, etc.), process factors (such as poor quality of teaching), and output factors (such as low recruitment of technical and vocational system graduates into the labor market). Given that the types of challenges may vary in different societies, one of the distinctive features of the present study compared to recent research is to examine the challenges of teaching practical issues in another community. The present study has also attempted to analyze and investigate potential contingent factors with a system-based perspective on the four dimensions of contextual, introductory, process, and output factors by examining various research and theories in the field of practical issues and technical and vocational education system.

Applying such a systematic approach to the challenges of technical and vocational education leads to an in-depth look at various contextual, conceptual, input, process, and output factors and avoids the mere consideration of inputs or outputs (Mojibur Rohman & Eddy Sutadji, 2018). The aforementioned problems in technical and vocational education in contextual, input, process and output dimensions have reduced the human capital in the country and this has decreased the social, physical and financial capitals. This research is an applied research and based on its results we can provide an analysis of different input, process, output and contextual challenges of technical and vocational education according to teachers' opinions. Such surveys can be effective in making decisions for those involved in the field and in providing effective and systematic solutions and planning so that the technical and vocational education system of Urmia city can further enhance the labor market skills of its learners and bring them lifelong learning. On the other hand, the groundwork for enhancing the quality of technical

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and vocational education can serve as a kind of hope for students who enter the education system to achieve their goals.

Therefore, the purpose of this study is to investigate the challenges of technical and vocational education based on the views of teachers of technical and vocational schools in Urmia. The main objectives of this study are:

- Investigating the contextual challenges of technical and vocational education in Urmia;
- Investigating the input challenges of technical and vocational education in Urmia;
- Investigating the process challenges of technical and vocational education in Urmia;
- Investigating the output challenges of technical and vocational education in Urmia.

Material and Method

In order to achieve the goals of the research, the survey method was used. The research population consisted of teachers of technical and vocational schools of Urmia city, Iran, with a total of 775 students in the academic year 2018-2019. According to Cochran's formula with 5% error level, the number of samples was calculated to be 257 but in practice 266 answered the questionnaire. The sampling method was random and since the samples were part of the social network of teachers in Urmia, 266 people participated in the study.

The measuring tool consisted of an online Likert-scale researcher-made questionnaire assessing the views of technical and vocational school teachers on the most important contextual, input, process, and output challenges of technical and vocational education. In order to obtain contextual, input, process and output factors for designing the questionnaire, studies carried out in this field as well as interviews with specialists, teachers and managers of technical and vocational schools were used. Delphi method was also applied in this regard. After the initial design of the questionnaire, the face validity of the questionnaire was assessed by 5 top university professors who were experts in this field. The construct validity of this questionnaire was also evaluated based on systems theory and theoretical foundations of technical and vocational education. The reliability of the questionnaire was assessed by Cronbach's alpha method. Cronbach's alpha was calculated separately for all four sections of the questionnaire (contextual, input, process and output) as well as the entire questionnaire, with the relevant results presented in Table 1.

Table 1. Cronbach's alpha to check the reliability of the questionnaire

Section	Number of questions (items)	Cronbach's alpha coefficients
Contextual factors	4	0.783
Input factors	20	0.902
Process factors	10	0.888
Output factors	10	0.904
Total	44	0.961

Cronbach's alpha coefficient was greater than 0.7 for all four dimensions of the questionnaire as well as the whole questionnaire; therefore, the questions enjoy good reliability. In other words, the questions

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are sufficiently well correlated to explain the research objectives. Frequency and mean were used for data analysis in descriptive statistics and one-sample t-test was applied for inferential statistics after confirming the normality of the distribution of scores. Questionnaire scales ranged from 0 to 5 with the interval scale and they were analyzed by one-sample t-test to determine whether there was a significant difference between the mean of a sample of a question with a hypothetical mean 3.

Results

Table 2 presents the contextual, input, process, and output factors of the technical and vocational education system designed during the review of research backgrounds and interviews with experts through Delphi method. Table 1 also presents descriptive values for the mean scores of the respondents to each of the questionnaire items separately for the contextual, input, process and output components of the vocational education system.

Table 2. Mean scores given to each of the questionnaire items from the teachers' point of view

The contextual dimensions of technical and vocational education			
Items	**Mean**	**Items**	**Mean**
1. How positive is the students' views (students' intellectual context) of the technical and professional value?	2.12	3. To what extent is the mass media aligned with technical and vocational education?	2.13
2. How positive is society's view of technical and professional status (intellectual and social context)?	1.91	4. How much is the relationship between industrial schools and the labor market?	2.05
Input dimensions of technical and vocational education			
Items	**Mean**	**Items**	**Mean**
5. How motivated are the students entering technical and vocational education?	1.79	15. How qualified are the teaching objectives of the industrial schools?	3.02
6. What is the scientific level of students entering the technical and vocational schools?	2	16. How do you think the quality of industrial school textbooks is?	3.02
7. How motivated are the teachers of vocational schools?	1.7	17. How qualified are the school's educational spaces?	1.50
8. How is the teachers' theoretical and practical mastery of the teaching subject matter?	2.32	18. How qualified do you think the teaching and laboratory equipment and supplies in vocational schools are?	1.47
9. How experienced are the teachers in teaching at industrial schools?	2.85	19. How much is the budget allocated to industrial schools?	1.41
10. How familiar are the teachers with knowledge of education?	2	20. To what extent can rules and circulars improve the quality of learning and teaching processes?	1.97
11. What is the scientific level of the managers in technical and vocational schools?	1.86	21. How is the quality of the teacher recruitment system for vocational schools?	1.74
12. How much is the level of managerial experience of managers in technical and vocational schools?	2.94	22. How much consistency is there between the fields of study and the regional needs of the schools?	2

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13. To what extent do school managers have the art of management?	1.65	23. To what extent are there appropriate instructional design models for teachers?	1.83
14. To what extent do support and service staffs (such as school janitors) have the necessary capabilities?	2.03	24. How familiar are the teachers with the methods of teaching a variety of practical and conceptual subjects?	1.91
Process dimensions of the technical and vocational education			
Items	**Mean**	**Items**	**Mean**
25. How much do teachers use the lesson plan in their work?	1.98	30. To what extent do you find the teaching evaluation methods of students appropriate?	1.84
26. To what extent do you assess the effectiveness of conventional lesson plans in improving educational quality?	1.84	31. What is the quality of teacher performance evaluation systems?	1.83
27. How is the quality of teachers' teaching?	1.9	32. How is the quality of extracurricular activities at industrial schools?	1.73
28. How is the quality of the work of the industrial schools' directors?	1.72	33. How is the quality of human relations in the schools between teachers and students?	2.40
29. How qualified is the support and service staff's work?	1.82	34. How is the quality of human relations among the staff at technical and vocational schools?	2.45
Output dimensions of technical and vocational education			
Items	**Mean**	**Items**	**Mean**
35. To what extent are the competencies and knowledge acquired by students in industrial schools appropriate to the needs of the labor market?	1.84	40. To what extent can technical and vocational education train independent students?	1.88
36. How much can the students achieve the set goals?	1.67	41. To what extent can technical and vocational education train creative students?	1.69
37. To what extent do the graduate students of technical and vocational system have the functional skills needed to live in a world outside the industrial schools?	1.71	42. How much do the graduate students of technical and vocational system have an entrepreneurial spirit?	1.71
38. What is the level of development of the talents of the graduate students in technical and vocational schools?	1.98	43. What is the level of recruitment (according to the field of education) among technical and vocational graduates in the labor market?	1.79
39. How is the growth rate of motivation for graduate students of technical and vocational schools?	1.83	44. What is the rate of access to higher education for technical and vocational graduates?	2.45

Based on the results of Table 2, with the exception of items on the quality of textbook objectives and textbook quality of the technical and vocational schools whose average scores are about the average level, the remaining items are below average (3). To answer the research sub-questions, it is necessary

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to analyze the mean scores of each of the four contextual, input, process and output dimensions. Table 3 presents the descriptive values for each of the four contextual, input, process and output dimensions.

Table 3. Descriptive values of research variables (dimensions)

Index / Variable	Context evaluation	Input evaluation	Process evaluation	Output evaluation
Mean	2.05	2.05	1.96	1.86
Median	2	2	1	1
Mode	2	1.9	1	1
Deviation	0.62	0.58	0.70	0.67
Variance	0.38	0.34	0.49	0.45
Skewness	1.19	1.64	1.17	1.73
Elongation	5.01	6.77	3.06	5.43
Variation amplitude	4	4	4	4
Lowest data	1	1	1	1
Highest data	5	5	5	5
Total points	546.25	545.45	519.3	493.9

In Table 3, the central tendency indices, such as mean, median, mode, and dispersion indices, such as standard deviation, variance, amplitude of variation, skewness, elongation, etc., are calculated. In fact, these values represent an overview of the status of the variables (dimensions) of the study at a glance. For example, in all four dimensions of research, namely contextual, input, process, and output factors, the average teacher response is lower than the average value (3). One-sample t-test was used to determine if the mean which is below the mean value is significant, and to what extent the findings of the research sample can be generalized to the research population. In the inferential statistics section, before performing the one-sample t-test, the hypothesis of this test, namely, the normality of the scores distribution was examined by Kolmogorov-Smirnov test, and since the P values in the recent test were greater than 0.05, then the hypothesis of normality of the scores distribution was confirmed. Table 4 below presents the results of the one-sample t-test for each of the research dimensions (variables).

Table 4. One-sample t-test results

Variables (dimensions)	Average sample difference from the mean (number 3)	t-statistic	Degrees of freedom	Significant value
Dimension of context evaluation	-0.94	-25.01	265	0.008
Dimension of input evaluation	-0.94	-26	265	0.007
Dimension of process evaluation	-1.04	-24	265	0.005
Dimension of output evaluation	-1.14	-27	265	0.007

In Table 4 the mean scores in each dimension are compared with the empirical median value (number 3). In this table the values of t-statistic, degree of freedom, and mean difference of sample scores from the experimental value (number 3) are calculated. Since the significance level for all four dimensions of contextual, input, process and output factors is less than 0.05, so at the 5% error level, the null hypothesis

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assuming that the mean scores of each dimension are equal to the mean value (number 3) is rejected. Accordingly, we conclude:

(A) It can be claimed with 95% confidence that the contextual factors (variables) of the technical and vocational education system of the city of Urmia have significantly lower quality than average from the teachers' point of view. According to Table 2, the contextual challenges of the vocational education and training system include inappropriate student and community views of technical and vocational status, lack of alignment of mass media with vocational education and training, and poor communication of technical and vocational system with the labor market.

B) It can be claimed with 95% confidence that the input dimension (variable) of the technical and vocational education system is significantly lower than the average quality from the teachers' point of view. According to Table 2, the factors that challenge the outputs of the technical and vocational education system include: low academic level and low motivation of students to enter technical and vocational system of education, low motivation, experience and academic and practical level of teachers; weaknesses in teacher training, lack of managerial and scientific knowledge and experience, lack of management skills, low professional capability of support staff, weaknesses in educational settings and lack of educational and laboratory facilities, inadequate funding, rules and regulations inconsistent with educational quality, poor quality in the teacher recruitment system, weak linkage between school curricula and community needs, lack of teachers' familiarity with the appropriate model of educational design, and teaching of a variety of practical and conceptual subjects, as well as lack of appropriate educational design patterns for educational design in technical and vocational schools.

C) It can be claimed with 95% confidence that the processes dimension (variable) of the technical and vocational education system in Urmia city from the teachers' point of view is significantly lower than the average. According to Table 2, the process challenges of the technical and vocational education system are: low use of the lesson plan by teachers and inefficiency of the designed lesson plan, poor quality of the work of the principals, teachers and support staff, inaccurate student evaluation methods, weaknesses in the staff performance appraisal system, poor quality of extracurricular programs, and poor quality of human relations among students and teachers and other school staff.

D) It can be claimed with 95% confidence that the output dimension (variable) of the technical and vocational education system of Urmia city from the teachers' point of view is significantly lower than average. Based on Table 2 the output section also includes these challenges: incompatibility of technical and professional skills and outputs with real labor market needs, poor achievement of students to the set goals, underdevelopment of talents, motivation, independence and creativity of students graduated, low recruitment rate of graduates in the labor market and higher education system.

So in general with 95% (and even 99%) confidence it can be claimed that the quality of contextual factors, inputs, processes and outputs of the technical and vocational education system of the city of Urmia from the teachers' point of view is significantly lower than average.

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Discussion

Technical and vocational education is one of the factors influencing the growth and development of the country. The purpose of this study was to investigate the viewpoints of technical and vocational teachers of Urmia city on the challenges of technical and vocational education in contextual, input, process and output dimensions. According to the results of the research, the technical and vocational education of Urmia was significantly lower than the average in all four contextual, input, process and output dimensions from the viewpoint of teachers.

There were no specific limitations in conducting this study and the results of this study are in line with those of Baniameryan et al. (2017), Jalilyan et al. (2017), Bohlouli Faskhoudi et al. (2016), Parand et al. (2013), Lin (2019), Haruna and Kamin (2019) and Okumu and Bbaale (2019).

One of the differences between this research and others is its research population and another is the use of a systematic approach to research that summarizes and analyzes the challenges in four dimensions of contextual, input, process and output factors. Given the systematic view of this study, it seems that changes in each component of the system affects the whole system; therefore, the challenges in any of the four dimensions mentioned is likely to lead to challenges in the whole technical and vocational education system. Similar studies are suggested to be conducted in other cities of Iran so that we can have a clear picture of the challenges of technical and vocational education in Iran. This research, along with other research examining the challenges of vocational education and training, is a prelude to examining operational strategies by the individuals and institutions involved, and to solve the challenges, it seems better to involve all the people and organizations that can play a part in solving some of the challenges. Practical suggestions that can be made based on the results of this research are very diverse in terms of the challenges presented by the teachers' point of view. For example, for promoting the place of technical and vocational education in the public minds and students' views, the mass media, as well as education itself can take appropriate action. In terms of recruiting teachers, administrators, and other human resources in technical and vocational schools, it is better to make some changes to provide the most appropriate choices. In this regard, it is likely that the development of programs for teacher training universities, including Farhangyan University, may be effective. Along with an effective recruitment system, it is recommended that a proper retention system be designed and implemented, and also, on the basis of the newest human resources empowerment approaches, teachers, managers and other staff are constantly empowered professionally. However, teachers, administrators, and other human resources themselves need to independently identify their own professional needs and act in a self-directed and independent way to update and empower themselves. Another suggestion is to inject the necessary financial, hardware and software resources into the technical and professional system, to strengthen the educational spaces and facilities of these industrial schools, and to harmonize existing laws and directives with regard to educational quality. Also, for a more connection of the technical and vocational system with the industry, it is better to run successful models that are used globally after adjusting to the conditions and making the necessary arrangements in the country. It is suggested that teaching and learning methods in the vocational education system shift from traditional

approaches to new ones such as constructivism and create conditions where individual differences of students are valued and that independent, creative, self-directed and lifelong learners are trained. Teachers need to design educational programs to improve the quality of student learning before teaching. It is also suggested that technical and vocational disciplines be aligned with the job needs of the local community and that arrangements be made to absorb graduates of the vocational education and training system into the labor market. It is also suggested that more research be done in other communities with different methods and data, and on the other hand, studies be carried out on designing the appropriate model of educational design and teaching as well as designing patterns of linkage between vocational education and the labor market. Specialized research on how to solve each challenge can also be effective. These suggestions are just part of the solutions that can be addressed in response to recent challenges, and certainly individuals and institutions such as teachers, principals, students, parents, education system, mass media, researchers, the Ministry of Industry and others, understanding the importance of the challenges, can design and execute the necessary operational plans in accordance with their responsibilities in a coordinated manner. Therefore, in order to meet the challenges, there is a need for a public intention, and in this context it is necessary to ask everyone to take action.

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