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The necessity of curriculum modification in technical and vocational schools Based on Germany's comparative study

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Abstract

Objective: the current survey examines the necessity of curriculum modification in Iran's technical and vocational schools. Method: this survey is based on comparative study and since Germany is one of the most prominent developed countries in technical and vocational education, we examine its educational structure and compare it with Iran's. Society: the case study is including the whole documents and available published resources gathered by national and international associations and the organizations in charge of education in Iran and Germany. Findings: findings show that the curricula of the official technical and vocational course including two branches work and knowledge, and industrial school composed of 53 and 58 basic lessons and approximately 43 and 39 special lessons, respectively. Holders of technical and vocational diploma certificate can embark on their careers after their graduation and military service or based on the rules and regulations, they can directly enter junior colleges and after passing 72 units, receive an associate degree. But the skill system in Germany is based on dual educational system. This system is called dual, since it operates in two educational environments; in economical institutes, and professional schools. These teachings normally take 3 years. The duty of this system is creating qualitative skills based on professional education rules and regulations and vocational orientation of education process. The objective of education in dual system is presenting basic educations regarding professions and the abilities and competencies that are required to perform professionally in the ever changing world, in the form of an integrated training course. Results: results indicate that technical and vocational curricula is not compatible with economic triple sector and inventing and developing courses and educational units and content editing do not take into consideration the needs, resources and contingencies of different parts of the country and the presenting education in industrial schools usually is dissonant with the technological requirements and progress. But Germany's share in its graduates and market's apprentices is above the average of European Union, the comparison made between Germany and other UN countries suggest that 60% of Germany's population aged 25-64 is included while this statistics in EU is 47%. The reason behind it is using dual system in Germany's educational skill system.

Keywords: modification, technical and vocational school, Iran and Germany, comparative study, dual system

Introduction:

Environmental changes with an astonishing speed have been passing through the threads of personal and social lives of human beings and have transformed all the obvious and concealed matters. In this capricious and mercurial world, only persons, organizations and associations can survive which would come to grips with these changes and react positively and appropriately to them. Institution of education, with its specific complexities and traits and its extensive scope of activities, is not an exception and should be able to react to society's cultural, political, social and economical changes. The point to be taken is that achieving an effective transformation program in this ever-changing world has become perplexing. Because the speed and extensiveness of these changes and transformations is so high that has challenged the opportunity of planning, editing and executing long term programs. The baffling aspect of this professional matter is twice stronger in institutes like institutes of education since it deals with "human being" and " humans' transformation", and its advancement has become more difficult unless the necessity of codification of strategic development plan (Sangeh,). Human beings' access to knowledge and skill for performing jobs is the minimum and simplest effort that they can put so that they would work and earn sufficiently to satisfy their least needs- materialistic needs (Sa'adat,). The role of institute of education in this field is completely apparent so that in national curriculum document of Iran –in secondary education sector- there is a specific emphasis on gaining practical skills for efficient life and achieving competencies related to technology and corresponding sciences to be prepared to start a career in different economical sections and social life (national curriculum document,). On the other hand, the importance and necessity of technical and vocational education's development as one of the development's branches and research tools and economical, social and cultural developments plan, is not hidden to any one. So that securing skillful and expert work-force to perform every plan is unavoidable and without it human resources and physical investments would go up in smoke, and due to this one of the factors that for years has been hampering the real execution of economical and social plans, is the lack of professional and skillful workforce suitable to administrative needs of plans specially in its middle part and of course education ministry is in charge of training and provision of such a workforce extensively (Khallaghi).

Because the secondary education is the chief source of training skillful and semi-skillful workforce, it affects economical and social development plans' success and this matter has been possible with education in the branch of technical and vocational studies. Nowadays, the necessity of connection and harmony between institute of education and market requirements and compatibility between teachings and professions is felt more and more, thus the educational planners have tried to prepare a favorable plan and to execute it extensively, since along with civil investment developments in the country, caring for an expert workforce is of special priority. In modern secondary education system, theoretical branches as well as technical and vocational courses have been designed to train skillful and expert human resources in disparate economical sections. It is expected that talented and intelligent learners attract to this branch with zeal and this would make it possible to achieve the strategic plan i.e. creating jobs via education. It is obvious that in addition to all the effects that these educations have on creating productive jobs, the cultural and ethical impressions to train independent and self-sufficient individuals is considerable (Mohammadali,).

Problem statement:

More than three decade have passed since the theoretical human capital got codified. During this period, the role and importance of technical and vocational education for social development in the developed and many developing countries have become recognized, So that many countries to transform their economical development have embarked on improvements and investments in their technical and vocational systems as the first step to reformation. Technical and vocational education is of that kind of teachings that its learners have rather more adaptation to the business world as compared to the graduates of theoretical branches. In other words, these graduates must be equipped with sufficient capabilities for their careers (Azad,). To estimate the real position of technical and vocational education in the current situations in education system, we should pay heeds that today's world is facing with the following total trends: information society, globalization in varied areas, modifications in production and organizing methods in the production and economical organizations, knowledge development, continuous technological changes and the important role of science in production, and this has caused to drastic changes in the skills and creation of new jobs that leads in the relentless need of market to the workforce with new skills or a complementary skill (Stenstrom, 2009). Society to achieve success and to progress requires an educated expert workforce and each education system or economical institute in case of possessing properties such as quality; profitability and flexibility can survive and realize the pre-determined objectives (Ja'fari,). According to UNESCO's definition, technical and vocational education in addition to general knowledge consists of all the phases and levels of educational process such as studying technology and sciences related to it, gaining practical skills, ability and approach and takes the charge of problems related to employment in economical and social aspects of life (Tappin,2002). From this perspective, technical and vocational system perceived to be one of the most important components of each country's education system, the main operator of training skilled and semi-skilled workforce in pre-university level.

Even though technical and vocational education have an evident role in the economical, social and personal development, the following problem in some countries, specially developing or underdeveloped countries, have necessitated the importance of revising and improving technical and vocational education; problems such as graduates' failures in the market, the lack of necessary correspondence between technical and vocational courses and geographical areas in the country on one hand and the result of that paucity on the other hand, the slight rate of graduate transferring from school to market with elementary level skills that is practically of no use, directing dull students to technical and vocational schools, high rate of dropouts specially in practical lessons, the lack of cooperation or rare cooperation of industries in academic planning, codification of contents, execution, and evaluation of technical and vocation courses, centralized curricula, triumph of educational lecturing methods over problem-solving method, defeating empirical assessment by paper-work assessments, overcoming of final evaluations over procedural assessments, paying less heeds to creation of job and inventive production, the low rate of interest in registering with technical and vocational schools (Mohammadali,).

One of the main targets of technical and vocational education in Iran is also applying teachings practically, and presenting techniques and skills required by the market and finally preparing the graduates for recruitment. But in a survey conducted by Kianmehr according to the employers, technical

and vocational school graduates and companies' CEOs, the connection between technical and vocational teachings to what is really needed in the market and society is average or low. Khallaghi expresses that from the total enrolled students in the high school courses between 35 to 40 percent would enter in technical and vocational schools and more than 60 percent of students do not receive enough professional training. Mohammadali also in a study found that technical and vocational education must increase the level of efficiency and job-creation to aid the economical growth and employment in order to improve society's living standards and realizing this goal depends on recognition of ever-changing needs in the market, applicability and flexibility of education system and one of the biggest barriers to this is the lack of conditions and grounds to realizing these properties and the most important problems to these three properties i.e. efficiency, flexibility, and being responsive to the market's needs are: the lack of systematic administrative structure of technical and vocational education, weak correspondences between technical and vocational education and production and service institutes, lack of scientific support to promote the quality of these educations.

The first country to respond quickly to new requirements of technical and vocational schools was Germany. This act was an effort to overcome commercial leadership of the English. They found using the most qualitative technical and vocational education in the schools, the best method for training more people at the shortest period. The German had realized that countries which equip its workforce with the best qualitative skills would attain industrial and commercial success, and this resource especially for countries owning fewer natural resources would be of great importance. German schools become a role mode for other European countries. Initially England and then Austria, Sweden, Italy, France, and ultimately Russia had embarked on emulating German schools and their curricula and methods to create professional schools (Vangerant quoted by Binefi,).

Due to this fact that Germany's education system is a skill-based system which has three mentioned factors, the graduates train in the real market environment thus the trainings are apportioned with technological developments in the market and have the required quality (quality) and the graduates after trainings will be absorbed by the same institute or another similar institute and the recruitment percentage of the graduates in this education system is very high (efficiency) and because the institutes require to respond quickly to be updated and competitive in international markets, educations get updated according to markets demands as well (Sabetnejad et al,). Therefore, in this study we aim at examining Germany's education system and begin to reform technical and vocational schools' curricula.

Methods:

This study applies comparative approach to scrutinize Germany's technical and vocational education system based on documents and available published resources regarding skill-based educational system in Iran, and documents and available resources of international associations and organizations in charge of skill-based educations in Germany and aim at curricula modification of technical and vocational schools in Iran.

Findings:

The educational structure of high school courses in Iran consists of two branches called the first high school branch and the second high school branch. The second high school branch is composed of three divisions including theoretical, skill-based (work and knowledge) and technical and vocational schools and the last two divisions are pinpointed to study in this paper. Training time in the second high school of technical and vocational branch as well as work and knowledge branch is 1480 hours. Those students who select technical and vocational courses would be trained in one of the following educational groups such as agricultural industries, electricity services, materials, shipping industry, agriculture, arts, management, internal, financial and administrative economics, and after passing 96 units in a three-year academic course attain enough competencies to enter the business world and to earn technical and vocational certificate. Those students who select skill-based branch (work and knowledge) after passing 96 subject units would be granted an educational skill certificate. The mentioned course would aim at providing society with a skilled or semi-skilled workforce in agricultural or servicing occupations. The holders of technical and vocational schools Diploma can enter the market after graduation and military service or according to rules can directly enter junior colleges and after passing 72 subject units receive an associate degree. To codify educational activities in this area in all the academic courses, technological approach is dominant. It is mentioned in this document that organizing contents in the second high school grade would be as follows:

1. First group: in this group students would be able to enter the business world after graduation. The selected occupations according to training time and other factors would be defined in level one or level two. Training institutes to operate these teachings could be held out of the school with the collaboration of government and private sector. The local requirements must be taken into account for designing and codifying this group's curricula.

2. Second group: in this group students would be able to be recruited by the market after achieving their associate degree. The occupations selected would be defined as level two or level three according to training time and other factors. The competencies of the main groups of profession and selected professional qualifications are balanced out. Teaching institutes is varied in these educations. Planning this group's curriculum is executed by the collaboration of institute of education and science, research and technology ministry (national curriculum,)

But high school education in Germany takes 5 or 6 years that divides into primary high school and high school. Students after graduating from the elementary school are faced with three options. The first branch is called General high school in which students perform technical and industrial occupations. The second branch is high school. This course is created for the student who would enter in commerce or medical studies to be recruited in commercial or nursing and medical technician jobs. The third branch is Grammar school. This school is customized for the talented students and it aims at preparing these gifted students to enter university or higher education. In all these three branches of schools, students after passing primary high school can enter technical and vocational schools. Skill-based system in Germany is compatible with Dual education system. This system is called dual, since it operates in two educational environments; in economical institutes, and professional schools. These teachings normally take 3 years. The duty of this system is creating qualitative skills based on professional education rules and regulations and vocational orientation of education process. The objective of education in dual system is presenting

basic educations regarding professions and the abilities and competencies that are required to perform professionally in the ever changing world, in the form of an integrated training course. Various academic methods and branches normally overlap with each other in dual system. Dual system is the main educational scope in high school level and about 53% of students during a period of one academic year are busy learning formal educational profession. Most of the graduates of dual system, after passing their training course attain a job as a professional workforce and use the facilities for higher educations in future. Graduates under specific terms and conditions, can earn professional diploma in full-time system and apply for academic educations (woll, 2008).

It is noticeable that in our country's national curriculum document also, in training and technical scope and organizing section of second high school course, have been mentioned that the educational institutes out of school can perform with the cooperation of government and private sector and regional needs must be considered for codification of curriculum. In this group the students would be able to work after graduation and military service (Islamic Republic of Iran's national curriculum document,).

Professional training in dual system normally deals with practical skills and thus increases job opportunities for technical and economical graduates and leads to their absorption in the market. In dual education system, economical institutes incur the training expenses and grant funds to the trainees and its amount would be approved of by authorities. This would make it possible for an individual to earn while he is studying. To enter dual educational system no terms and conditions are set, the entrance is open to all. The number of trainees depends on the graduates from the lower educational levels and the training would be done via a study contract between the institute and the trainee. Trainees are being taught and trained 3 to 4 days in the economical institute and up to 2 days in the professional school. The amount of fund being granted would rise every year and on average it includes one third of a skilled and trained laborers' wage initially. The organization responsible for codifying curriculum in Germany is formed in a way that the governmental assignments would be shared between the government itself and 16 divided States are in charge of education in official schools and also technical ones. All the rules and regulations regarding schools, even the rules regarding educations in professional schools, are considered federal rules. Instead, the charge of professional education out of the school and in the economical institutes is taken by the government (Sabetnejad et al,). Basically, job or academic orientation in Germany's states is one of the consistent components of the schools' planning curricula. Even though in the majority of professional schools, there is a special lesson called "teaching occupations", in general education schools this subjects has been divided in other specialties like economics, techniques and services. Job orientation in the schools are normally operated via visiting or training in the economical institutes during a period of 2-3 weeks that gets completed in the ninth and tenth year of general education (Hoeckel and Schwartz, 2010).

One of the educational models that have a great deal of application in dual system is training and learning and simulated teaching (SITTAL). In this method the process of training-learning is performed in a stimulated environment similar to the real work environment (workshop or internship training). In codifying internship curricula we must powerfully taken into consideration the following factors with the use of information technology: economical, social, ecological, psychological approaches, labor, demand and thinking of employers, familiarity with economical culture and also updating different forms of

professions and job organizations (the common report of UNESCO and UNIYUK, 2006). This is the same method that being applied in Iran's organization of technical and vocational education, in unofficial education sector (Sabet nehad et al,).

One of the other methods used in Dual education system is training-learning and professional teaching based on the project named POTTAL. This method is based on educational centers' participation in the factory projects and industrial workshops. The useful experiences which passed on to the trainees in the form of engineering projects, creates a new way of collaboration especially with the small or average-sized workshops. Through this way we can guarantee the optimal utilization of current resources for both the parties involved in education (trainee and trainer) and mutual know-how transfer and thus the professional education according to the course and the latest changes in the market. One of the other educational models being used in dual system is named training-learning and professional modularized teaching (MOTTAL). In this model, knowing that training module is a collection in which an occupational instructions and teachings would be given, thus modularizing education in particular professions that are capable of being divided into smaller subdivisions ended up to a job is one of the common methods of professional training being done in two ways:

A. categorizing of homogeneous abilities in work environment and classifying work units in the skill-based modules

B. Breaking a super profession into its smaller components in a way that each smaller component ends up in a job itself (Shwarz and Hoeckel, 2010).

With respect to the skill assessment system we should remind you that the first goal of skill-based education is to utilize required abilities of a job in the real environment for the young trainees in a way that enables them to perform job-related activities alone or in cooperation with the others effectively and precisely. The exam for the end of professional education is based on practical work. Basically the final exam is including 4 or 5 operational areas based on regular job tasks. The general exam including literature, English language, mathematics … is operated in the similar way of the school exams. Even though the economical institutes and professional schools are in charge of executing education, the authorities and stakeholders are responsible for the exams regarding determination of professional qualifications. In order to perform the mentioned task, the trade associations and authorities would arrange an exam committee for each practical. To take the final exam in official educational courses, industrial and commercial associations would arrange the exam committee. This is bound to this term that the association is able to perform according to the rules and regulations of the examination (woll, 2008). Basically in the skill-based education system of Germany, social colleagues are of great importance in technical and vocational trainings. Social colleagues are composed of: industrial sectors, business associations, agricultural associations, private jobs, services, hygienic sector, and also over 900 of training workshops (Sabetnejad,).

Discussion and conclusion:

Technical and vocational education must be able to cooperate with the business world and the typhoons of industry and production in educational processes to provide conditions and facilities required for

current technological changes and skill modifications and professions and also with realizing the market requirements can be responsive and attentive to its ever changing needs. Khallaghi believes that to reinforce the trainees, the theoretical knowledge must be combined with the practical work to create the required conditions to learn the skills and professional training for the trainees. Utilization of other countries' experiences in this field would be really useful. Schober et al (2009) reported that Germany's share in its graduates and market's apprentices is above the average of European Union, the comparison made between Germany and other UN countries suggest that 60% of Germany's population aged 25-64 is included while this statistics in EU is 47%. The reason behind it is using dual system in Germany's educational skill system. Basically to increase training opportunities for the young in Germany, the existing potential in the economical institutes are being exploited at the best level. One the important factors taking part in this matter is an educational package which being agreed upon between the government and the economical unions heads of Germany for three years. In this package the parties have agreed to collaborate intensively to increase considerably the skill-based training efficiency by the end of year 2007. Besides, to increase the cooperation rate of the institutes in training settings, the plan of Germany's education and research ministry, and the learning plan for the next generation were executed. The objective of this plan started in the year 2005 was improving the structure of regional education and consequently the optimal provision of training place in economical institutes for the young since the economical institutes could utilize the education process. During the period of 2005 to 2010 the ministry of education and research of Germany allotted 125 million Euros for the execution of training for the next generation plan and it was supported by the financial aids of European social association.

The recent researches in our country have shown that the technical and vocational curricula is not compatible with economic triple sector and inventing and developing courses and educational units and content editing do not take into consideration the needs, resources and contingencies of different parts of the country and the presenting education in industrial schools usually is dissonant with the technological requirements and progress (mohammadali,). We should tend to this fact that the majority of graduates are unemployed and a lot of them (almost 60 %) are not working in the field related to their course (Navidi et al,), so with an optimistic approach we can assume that 60% of the trainees do not take any advantage out of their training course and be employed in the jobs unrelated to what they have studies and trained for. In fact if we suppose that the trainings had been done perfectly good practically the effectiveness scope of trainings would include 16% of high school students. In addition to that, those students who apply for junior colleges or universities to obtain associate or bachelor degree would find a part of these programs' curricula similar to what they have already studied in the school (Khallaghi,).

Skill-based trainings as one of the most significant parts of our country's education system is applied to train skilled human resources and to disseminate the deep and rich culture of job creation and professionalism. With respect to the significance of the matter, we should consider some modifications in skill-based trainings and curricula contents and also persons should be appointed in high positions who are interested in production development and they should provide proper conditions for inventive job-creators. According to results found in this paper, studying skill-based training system in Germany to absorb the graduates in the market shows that the curriculum modification is inevitable. With realizing and applying effective educational methods and with the executions of tasks such as training courses

required by and based upon workshop training, stimulated and similar to the genuine business environment and codification of a generalized assessment system and curriculum content according to educational and vocational scales, maintaining a mechanism of regular and updated feedback and reform and ameliorate these industrial schools schedule, the bases for creativity development and job invention would be provided and we can expect skilled trainees equipped with effective technical and professional aptitudes to enter the market.

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