



A Comparative Analysis of Iranian Polytechnic Higher Education with Selected Countries

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| ARTICLE INFO | ABSTRACT |
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| Received: 26 September 2019 Revised: 02 November 2020 Accepted: 12 February 2020 Online: 17 March 2020 | This paper aims to compare polytechnic education in the Iranian higher education system with selected countries (USA, Canada, UK and Japan). As a comparative study, the selection of the countries under study were based on purposeful sampling and the data collected through the study of documents, national reports and websites searches of the Ministry of Science of the countries under study. The findings of the study indicate that the developmental process of polytechnic education in Iran has been slow and prolonged compared to the selected countries. Similarly, there is no significant difference between the countries selected for curriculum content and teaching methods. The main difference between Iranian polytechnics and comparable systems is the lack of attention to labor market needs and the lack of links between industry and higher education. |
| KEYWORDS Polytechnic Higher Education Selected Countries Comparative | |

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1. Introduction

The educational system serves as the cornerstone of social and economic development, and leads to greater investments in education. Stanley and McCann believe that educational policy in most countries is inspired by the theory of human capital that emphasizes the essential role of knowledge and skills emphasize development (Stanley and McCann, 2009). The value of human resources training investment has made developed countries spend huge amounts every year (Kauffeld and Lehmann-Willenbrock, 2010).

One of the most important parts of the education system is the technical education system for effective human resources training (Simsek and Yildim, 2000). Technical education is one of the tools of industrial development and consequently economic development (Salehi Omran, 2004; Sabet Nezha et al., 2011; Ghenaii et al., 2014; Bagherzadeh and Osareh, 2015; Maghsoudi, 2014). Technical education is an important tool for enhancing the dynamics, adaptability and productivity of the workforce and provides a framework for reducing labor market imbalances (Azizi, 2005). The purpose of technology or polytechnic training is to develop learners' skills in crafting machine tools, reinforcing work cultures and familiarizing them with the scientific principles of production and safety rules (Kelment & Kelmentova, 2016) .

Given the importance of technical education over the last three decades, many researchers have been interested in examining its many dimensions (Hanni, 2019; OECD, 2015; Stevens, et al., 2015; Fiszbein and Psacharopoulos, 1993; Mundle, 1998; Bennell, 1996; Psacharopoulos, 1993, 1987). For example, UNESCO's report on two international conferences, the Paris (1989) and Seoul Conferences (1999) emphasize that human- centered development and the key to development is technical training (UNESCO, 1989, Mohammad Ali, 2011). New needs such as globalization, the challenges and needs of the labor market, the formation of a knowledge-based economy, the rise of youth and graduate unemployment, and the growth of the offshore economy have fueled the development of modern professionalism (Ghaneirad, 2003). The new type of university is focused on the relationship between labor market and industry. For instance, Sporn (2001) states that European universities face the challenge of competitiveness and resource depletion, and that only those that remain can adapt to these conditions (quoted by Kurdenaj et al., 2012). Etzkowitz et al. (2000) view the future university and the future of the university as influenced by the entrepreneurial paradigm and the triple helix approach of university, industry and government. In

their view of today's world, the evolution of the university-wide approach has led to the emergence of new terms such as corporate university, innovative university, adaptive university, Third Wave University, university of technology and vocational university (Yemeni Duzhi Sarkhabi, 2013).

In Iran, Dar al-Fonoon was founded in 1851 as the first center for modern technical and vocational higher education. The establishment of Dar al-Fonoon also became the source of important educational-scientific developments in the Iranian educational system from elementary to higher levels (Ghorchian and Khorshidi, 2000: 30) After Dar al-Fonoon, Tehran Technical College (Tehran Polytechnic), Sharif University of Technology, Iran University of Science and Technology, Khajeh Nasir Toosi University, and Isfahan University of Technology amongst others were established as technical and engineering universities in the last century. Despite this slight growth, Iran's polytechnic universities face qualitative challenges that make it inevitable for them to pay attention to the experiences of other countries. The purpose of this study was to compare the status of Iranian polytechnics with selected countries. For this purpose, the main research questions are as follows:

- What are the similarities and differences in educational objectives between the Iranian polytechnic system and those of the countries selected?
- What are the similarities and differences in terms of training delivery between the Iranian polytechnic system and those of the countries selected?
- What are the similarities and differences in the curriculum between the Iranian polytechnic system and the countries selected?

2. Research Method

A comparative research method with a qualitative approach was used for the purposes of the present study. These countries were chosen based on the strategy of "different systems, similar results". The internet homepage of polytechnic universities in these four countries were used for data collection. National and international reports were also of interest to the researchers. For analyzing the data and presenting the results of the research, a four-step regional bridging model was used.

3. Results

Question 1: What are the similarities and differences in terms of educational goals between the Iranian polytechnic system and those of selected countries?

A) Description

Canada

In Canada, the polytechnic model does not follow the formal structure of the national higher education system. In fact, in Alberta alone, polytechnic institutions are recognized as part of higher education. Thus, despite many states' efforts to reform the higher education system, there is no precise and standard definition of the state-level polytechnic system. On the other hand, a group of higher education institutions are working to develop a new model that is able first to meet the labor market needs of skilled workers and secondly to emphasize the need for Canadian industries for applied and innovative research (Marshall, 2008). However, Canadian higher education institutions are exploring organizational approaches to adaptation and reform so they can effectively adapt to global change and effectively manage the rising demand for higher education by young Canadians (Doern, 2008). For this reason, the technique of polytechnic education in Canada is project-driven and variable.

Iran

In spite of numerous limitations, harms and challenges, the environment, content, and teaching methods in industrial universities have maintained their momentum to some extent and are seeking to achieve significant scientific and technological achievements by designing relatively up-to-date topics. The use of new approaches to entrepreneurship such as supporting the scientific elite and granting scholarships is a priority of polytechnic education. The method is more empirical and student-centered (Tehran Poly Teknik, 2017).

Japan

In Japan, the methods of conducting experimental and group polytechnic education are encompassing all segments of society. Polytechnic schools accept the youngest group of applicants as students. These universities provide vocational training for those who have completed special programs, high school graduates or adults (Education in Japan, 2006).

United Kingdom

UK polytechnic education after transforming the organizational structure into a university is a combination of an academic, applied and empirical system. The UK polytechnic education system teaches a large number of short courses, almost half of which are in the technology sector. In this country, the quality of the methods used in education is also enhanced by the use of new techniques and innovative technologies (Ahola, 2006).

United States of America

In the United States, the purpose of polytechnic education is to teach on the job and to learn by doing. In addition, each state has its own goals based on the need for the labor market. Strategic goals in polytechnic education include increasing access to and facilitation of college entry, workforce training, quality improvement by strengthening colleges, and increasing graduation and employment rates where high skills are needed. Hence, more practical and commercialized teaching methods are being developed. The structure of polytechnic education in the US varies slightly from place to place, yet most polytechnic students receive technical and vocational education certificates (UNESCO, 2016).

B) Interpretation

Canada

Traditionally, the Canadian higher education system has been monitored by state governments (decentralized systems). For this reason, states consider academic structures in line with local conditions and market demands while taking into account the needs and demands of the federal

government and the international market. Although there are differences between the two federal and state higher education systems, in most cases, core structures, colleges and universities can be used to play unique roles in knowledge production and information transfer process (Marshall, 2008).

Iran

Due to the overemphasis on theoretical education, the polytechnic education system has attempted to compensate for this weakness through the use of modern teaching methods, internships and student projects. In addition to tackling the large number of unemployed university graduates in Iran, entrepreneurship courses have attempted to support the creation of new business opportunities.

Japan

Given Japan's culture of value for labor, collective effort has made polytechnic education a better fit for the local labor market. Therefore, the training is long, purposeful and empirically and collectively provided.

United Kingdom

Because polytechnic education has been incorporated into university education since 1992, it is a combination of the comprehensive university system. Furthermore, due to the need of the labor market and reforms in the training of specialists, the use of dynamic techniques and modern methods of short-term training are of interest to policymakers.

United States

In the United States, being one of the top industrialized countries in the world, one of the criteria for university accreditation is the proportion and rate of employment and access to employment amongst college graduates. Therefore, the most important purpose of polytechnic training is to

train skilled technicians to fit the job market. The goal is, therefore, to educate, commercialize and apply more practical teaching methods.

C) Juxtaposition

The Juxtaposition stage information collected from the previous steps (1 and 2) is categorized and compared to provide a framework for the next phase.

Table 1- State of Polytechnic of Selected Countries (Juxtaposition Stage)

| Countries | Policies and Development Status of Polytechnics (Educational goals) |
|----------------|---|
| Canada | <ul style="list-style-type: none"> - Developing relationships between university and industry - Development of strategic research to establish new areas of technology - Changes in research budgets that include a fixed percentage of GDP - Emphasis on evaluating science and technology and measuring research performance - Development of international cooperation |
| Iran | <ul style="list-style-type: none"> - University-centric collaborations - Master-centered collaborations - Student-centered collaborations |
| Japan | <ul style="list-style-type: none"> - Balanced promotion of different levels of research - Researcher training - Improve Research and Development - Promoting information research and development in knowledge - Increasing Research and Development Exchanges - Effective use of research and development credits - Publishing research and development achievements - Promoting science and technology learning |
| United Kingdom | <ul style="list-style-type: none"> - New financing mechanisms - Modular and pioneering dynamic polytechnic structures - Independent research studies - Part-time courses at all levels - Development of short-term degrees in science and technology - Significant variation among polytechnic colleges in terms of enrollment and proportion of full-time and part-time students |
| United States | <ul style="list-style-type: none"> - Complex and multi-faceted academic system - Development oriented and responsive to the needs of the labor market - Attention paid to small states - Collaboration between Massachusetts Polytechnic University and British Columbia and colleges - The link between industry, government and the university |

D) Comparison

Analyzing and comparing the structure, mechanisms, goals, and development strategies of the Polytechnic Universities in the countries under study in educational, research, and entrepreneurial contexts indicate that these countries have similarities and differences in some respects. The following is a brief summary of their similarities and differences:

A) Similarities

- Overall, the polytechnic education of the countries studied is development-oriented and responds to labor market needs.
- The development of international cooperation is within the scope of the countries under study.
- Polytechnic universities in selected countries are working to link industry, government and the university.
- Polytechnic education in selected countries emphasizes science and technology assessment and research performance measurement.
- Improving facilities for promoting research and development is a feature of the polytechnic in most of the countries under study.
- Consideration of funding mechanisms and research credits are common features of the countries under study.

B) Differences

- In the United States, there is a complex, multi-faceted system of polytechnic education. Special attention is also paid to small states.
- Canada's distinction is in developing strategic research in polytechnic education to establish new areas of technology.
- In Japan, polytechnic education policy priorities include upgrading the various levels of technical education, improving facilities for research and development, and enhancing scientific exchanges.

- Dynamics and diversity in polytechnic curricula, diversity of registrants, diversity in full-time and part-time courses and the development of short-term degrees are major indicators of UK polytechnic education.
- In Iran, special attention is paid to the development of international cooperation at three levels: university liaison, faculty research opportunities and joint industrial and research projects.

Question 2: What are the similarities and differences between the Iranian polytechnic system and those of the selected countries in terms of training methods?

A) Description

Canada

In Canadian academic development, emphasis is placed on applied sciences and, therefore, funding for industrial projects through polytechnic universities. In the present research, the examples used were from the three provinces of British Columbia, Alberta and New Brunswick. Major technology institutions in British Columbia and Alberta describe themselves as "technical institutions" and are among those that have formed a national lobby group to support polytechnic centers. A recent report by New Brunswick (2007) reports the creation of a number of polytechnic institutions in Canada that have been supported by the merger of some local colleges with regional universities (Commission on the Post-Secondary Education, 2007). In Canada, state-owned polytechnics are distinct from management and are mainly managed by local education authorities (Etzokovich and Lidsorof, 2010).

Iran

The modern higher education system in Iran began with the establishment of Dar al-Fonoon as the first polytechnic-style university center (Azizi, 2006). In 1928, with the founding of Amir Kabir University of Technology (Tehran Polytechnic) as the mother of industrial and technological universities, the system of polytechnic education experienced a new era. According to statistics from the Ministry of Science, Research and Technology, in 2019, 31 Iranian Universities of

Technology, Universities of Technology and Science and Technology Complex are active in Iran including Sharif University of Technology, Amir Kabir University, University of Science and Industry, Isfahan University of Technology, Technical and Vocational University and Babol Noshiravani University. The aforementioned universities are the most high ranking in terms of educational, scientific and research performance (MSRT, 2020).

Japan

Japan's modern higher education system employs a number of approaches and ideas that have been adopted from Western education systems and integrated with traditional Shinto, Buddhist and Confucian philosophies. Between the nineteenth and twentieth centuries, many fundamental reforms were made in the field of higher education throughout Japan which contributed to students' individual performance as well as to overall authenticity of the nation, creativity, individuality, identity and internationalization of higher education. In 1965, the Science and Technology Agency was formed to support science and technology under the Prime Minister's authority to plan and develop basic science and technology policies. In the Japanese state structure, the Science and Technology Agency operates under the supervision of the Ministry of International Trade and Industry. In 2011, Japan Polytechnic University decided to cancel its undergraduate and postgraduate studies and focus its primary mission on training professional teachers (active workers and graduate students) (Goodman, Hatakenaka and Kim, 2009). In Japan, the focus of efforts to increase capacity and technology development is seen as one of the foundations of securing economic growth and building the foundations for future development of the private sector (Mardani, 2013).

United Kingdom

In the UK, polytechnics were initially referred to as institutions of higher learning that provided education at all levels of education and focused on teaching in fields such as science, technology, engineering, and mathematics. However, after the adoption of the Higher Education Act in 1992, these institutions became independent universities (Ahola, 2006). The UK experience in polytechnic centers is fascinating. In the 1960s, when colleges of art, business and other institutions became polytechnic, England created a Duval academic system. In fact, the polytechnic system with

the support of the Labor Party emerged from the incorporation of more than 70 former technical colleges which became known as "comprehensive scientific communities" to accommodate a wide range of students at all levels of higher education (Pratt, 1997: 34).

United States of America

The United States has one of the most diverse multilevel higher education systems with more than 4,000 public and private colleges and universities (OECD, 2007). The country's higher education system includes three types of university education:

- Comprehensive colleges and universities that offer undergraduate and graduate degrees.
- Research universities that offer undergraduate and graduate degrees and support the award of doctoral degrees through their research mission.
- Community colleges and colleges that offer vocational training degrees (McGuinness, 2005).

B) Interpretation

With a description of the polytechnic status of the selected universities, this section of the article deals with the polytechnic status of the selected countries.

Canada

At the national level, a lobbying group has recently been formed to promote greater understanding of polytechnics in Canada and its key goals (Polytechnic Canada, 2007). The organization currently has eight members, including the North Alberta Institute of Technology, Southern Alberta Institute of Technology, British Columbia Institute of Technology (BCIT), and five Ontario Colleges of Applied Arts and Technology including Kesteven Institute, George Brown College, Humber Institute, Cincinnati College, and Sheridan Institute (Doern, 2008). One of the main priorities of these centers is to promote commercialization and academic mobility through an accreditation system to meet the shortages of skilled labor (Polytechnics Canada, 2007).

Iran

The increasing rate of unemployed educated population in the country has doubled the need to strengthen the link between the higher education system and the labor market and the use of work-based education models. The development of industrial universities emphasizing the integration of the theoretical and practical dimension of education not only enhances the external efficiency of the higher education system but also as a third-generation and entrepreneurial university, contributing to the faster realization of the knowledge-based economy. In addition, the Ministry of Science, Research and Technology's policy is to gain experience from other countries through international cooperation, signing international contracts and agreements,, establishing specialized committees focused on research and encouraging academics to take advantage of scientific opportunities and undertake joint academic- industrial research projects.

Japan

Polytechnic centers in Japan are vocational training institutes for short- and long-term programs. These centers are part of the facilities and resources of government human resources development that work by law to promote the professional development of citizens. Japan offers a variety of facilities through which state vocational training is provided. There are mainly two state-level offices for managing these trainings: one at the Ministry of Health, Labor and Welfare (MHLW) and another at the Ministry of Education, Culture, Sports, Science and Technology (MEXT). A variety of educational facilities including polytechnic schools, polytechnic colleges, polytechnic universities and polytechnic colleges are also available for disabled people.

United Kingdom

In the UK, science and technology policy has entered a new era after the era of strategic opportunities in the 1980s. The decline in fundamental research funding, the rapid increase in research costs, and the lack of opportunities for young researchers have led to what the Organization for Economic Co-operation and Development has called "pressure systems" (Eggleston, 2002). For this reason, the establishment of polytechnic centers has become a requirement of a large part of the higher education system to better meet social needs. In fact, the need to link the government to the labor market has put the UK in a competitive environment. In

general, there is a need for policy makers in disciplines that can respond to labor markets and professionalism.

United States of America

As the US higher education system is a dynamic and competitive system, not only because of the integration of public and private institutions but also because of the pressure of individual institutions, special attention is given to local technical colleges (McGuinness, 2005). Polytechnic education also appears to be part of the program structure of many other colleges that are willing to serve the state.

C) Juxtaposition

Table 2 demonstrates a comparison of the quality of polytechnic educational methods in the selected countries under study.

Table 2 - Juxtaposition of Polytechnic Training Methods in Selected Countries

| Countries | Juxtaposing methods of implementing polytechnic education |
|----------------|---|
| United States | <ul style="list-style-type: none"> - Training about work, for work and through work - Increase access to and facilitation of college entry, quality improvement by strengthening schools and increasing graduation rates and employment rates where there is a need for high skills. - Collective methods and projects - Pivotal discipline and focus on everyone's talents |
| Canada | <ul style="list-style-type: none"> - Decentralized education system - Meeting the needs of the market - Collaborative methods (project and research oriented) - Educational reforms tailored to the needs of the labor market and industry |
| United Kingdom | <ul style="list-style-type: none"> - Short Courses - Using dynamic and pioneering techniques - Focus on the needs of industry and labor market - Specialist training for labor market needs |
| Japan | <ul style="list-style-type: none"> - Experimental and group methods - Commitment to professionals by giving them responsibility - Entrepreneurship and attention to creativity - Pivotal learner and use of world-class technologies in teaching |
| Iran | <ul style="list-style-type: none"> - Entrepreneurship and attention to creativity - Axial Apprenticeship and Experimental Methods - Student internship - Focus on projects |

D) Comparison

The polytechnic education system in the countries under study also has similarities and differences in the method described below.

A) Similarities

- Training in all four countries is in the form of the collective and project-based.
- Polytechnic education in all four countries are tailored to meet market needs.
- In all four countries, special attention is paid to the entrepreneurship and creativity of students.
- In all four countries, education is student-centered.
- In all four countries, the dominant teaching method is the experimental one.

B) Differences

- In the US, education is about work, for work and through work.
- In Canada, teaching methods are participatory (project and research oriented).
- In Japan, the emphasis is on fostering professional commitment.
- In England, the emphasis is on using dynamic techniques.
- The distinction between Iran's polytechnic teaching method and that of the selected countries is in the degree of importance that these countries give to student apprenticeship.

Question 3: What are the similarities and differences between the Iranian Polytechnic system and those of the selected countries in the curriculum?

A) Description and interpretation

Canada

The goals of the Canadian polytechnic curriculum include enhancing the quality and diversity of programs and teaching innovation, focusing on provincial and state accountability, establishing regional universities, adhering to strong federal and provincial discourses and policies, implementing strategies that link industry, universities and government, and establishing

polytechnics to regulate the labor market and trade. The educational curriculum in Canada includes theoretical and practical lessons that are delivered simultaneously. Evaluation of academic achievement is also carried out at both general and practical levels (University of Alberta, 2019, University of British Columbia, 2019).

Iran

The goal of the Polytechnic curriculum in Iran is to train students to be capable of problem solving, analysis, design and construction. This program prepares students for entrepreneurship, industrial work and graduate study. Course content and evaluation at Iran polytechnics are theoretical and practical (Tehran Poly Teknik, 2017).

Japan

The purpose of the curriculum in Japan is for students to complete an apprenticeship to an acceptable level of technical skills to test their business skills in order to enter the job market. Evaluation in Japanese polytechnics comes in three forms: technical (business skill acquisition), theoretical evaluation (knowledge acquisition), and practical evaluation (acquisition of market-required capabilities) (Poly Technic PTU, 2010).

United Kingdom

The most important goal of the polytechnic curriculum is to create creativity in the curriculum and to develop the knowledge and skills of the students. The courses are theoretically and practically implemented and evaluated in three ways: self-assessment (student evaluates his / her activities), multi-stage research and evaluation projects (initial evaluation, developmental and condensed evaluation) (Birmingham City University, 2019).

United States of America

The formulation of curricula at college and university levels by national agencies and academics has led to the creation of a national applied curriculum in the United States. The adoption and public acceptance of these criteria by state and local colleges has strengthened the privilege of subject-centered curriculum in all US colleges. Therefore, the goal of the polytechnic curriculum in this country is development oriented and goes forth with emphasis on entrepreneurship. Learning content in US polytechnics is based on specialized and general courses set by the college and each state has degree of freedom relative to its own college setting (Papic and Bjekic, 2005). Evaluation

methods in the American polytechnic system are qualitative and not evaluated by percentages and grades; students are evaluated by projects and some form of self-evaluation is considered. Three types of fundamental assessment are identified in polytechnics: classroom assessment, public evaluation, and national evaluation (Sullivan and McIntosh, 1996).

B) Juxtaposition and Comparison

Table 3. Juxtaposition and Comparison of Curriculum in Selected Countries

| Countries | Target | Educational content | Evaluation method |
|----------------|---|--------------------------------------|--|
| United States | Development-oriented and forward Focus on entrepreneurship Decentralized curriculum | Specialized courses Basic lessons | Classroom Evaluation General Evaluation National Evaluation |
| Canada | Increasing the quality and variety of programs and teaching innovation Focus on Provincial Accountability Curriculum Innovation | Theoretical and practical lessons | Evaluation of academic achievement at both general and practical levels |
| United Kingdom | Creativity in Polytechnic Curriculum Knowledge development and skills in students | Theoretical and practical lessons | Self-evaluation Performing research projects Multi-stage evaluation |
| Japan | Obtaining an acceptable level of technique to test business skills Gaining knowledge and practice to fit the job Enhancing applied technical and professional knowledge | Native content | Evaluation of technical level equivalent to commercial skill test Evaluating job knowledge to practice for the right job Practical evaluation of market-related capabilities |
| Iran | Focus on entrepreneurship Training students to work in industry | Theoretical and practical | Theoretical evaluation Practical evaluation |

As with the other components of the higher education system, the polytechnic universities in the countries chosen have some similarities and differences in curriculum content and evaluation methods. The findings of the analysis and comparison are summarized below.

A) Similarities

- The goal of the curriculum in all countries under study is to focus on creativity and entrepreneurship.
- Polytechnic curriculums emphasized the development of students' professional and business skills as one of their main goals in most of the countries under study.
- Polytechnic courses in the countries under study are a combination of theoretical and practical courses
- Evaluation is carried out theoretically and practically in most countries studied.

B) Differences

- The purpose of the curriculum in the United States is development-oriented and decentralized.
- An obvious feature of the Canadian polytechnic curriculum is accountability driven at the provincial and state levels in addition to its diversity and innovation.
- The United Kingdom pays special attention to business skills in its polytechnic curriculum.
- Evaluation practices in the United States are mainly conducted at three levels of class, public and national.
- Japanese polytechnic curriculum content is native to Japan.

4. Conclusion

According to the present study of the status of polytechnics in the selected countries, the findings suggest that in the US, the role and position of technology universities is much more prominent than polytechnic institutions. Transforming the dual education system into a comprehensive one and focusing on applied sciences and student-led industrial projects are Canada's major policies in polytechnic education. In the UK, polytechnics cover a large part of that country's higher education. In Japan, technology and polytechnic development has been cited as a strategic policy to offset the country's excessive access to minerals. In this country, the public sector operates as a complement to the private sector and extends technologies that are out of reach. In Iran, polytechnic policy is based on international cooperation through joint courses, international

workshops, and the establishment of specialized cooperation committees between polytechnic universities.

Research findings on training methods in the selected countries studied depict their differences. For instance, in the United States, focus is on increasing access to and facilitation of college entry, on-the-job training, and quality improvement. In Japan, the focus is on professional commitment but in Canada it is on project-based education. In England, the curriculum centres on the use of dynamic and pioneering techniques while in Iran, the emphasis is on internships and distinctive projects.

Assessment of the curriculum status in terms of the three categories of purpose, content of education and evaluation method showed that the goal of the studied countries is to focus on creativity and entrepreneurship and to develop students' professional and business skills. The findings also indicated that in both Canada and the United States, the provincial and state curriculum is responsive to the labor market. The content of education is also specialized and public in the selected countries. In only Japan, the emphasis is on content localization. In terms of evaluation techniques in polytechnics, evaluations are mainly conducted qualitatively in the selected countries under study.

Based on the research findings, the status and policies of the polytechnic approach in the selected countries demonstrate a growing trend leading to the development and linkage between academia, industry and government. Furthermore, in the last few decades, Iran has pursued progressive policies in polytechnic education which can be attributed to the process of internationalization and to new technologies. The major disadvantage of Iran's polytechnic system is the lack of a suitable link between the academic, industrial and labor market systems, which has resulted in the emergence of unemployed graduates, lack of industry dynamics, and the mismatch between government policies and higher education. One of the most effective strategies for strengthening the polytechnic approach in Iran is identifying and assessing the needs of industry and labor markets. Moreover, given the weaknesses of the polytechnic system, these centers are in transition process from traditional centers to new institutions.

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