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Quality Assurance of Qualifications in TVET: Korea Case Study

Abstract

Quality assurance of TVET in Korea has been mainly led by the government since 1960s and now this system is sustained by two quality assurance systems: National Technical Qualification System (NTQS), and Private Qualification System (PQS). Since 1973, NTQS has been administered by the MoEL, which is working as a quality controller of TVET in Korea. However, NTQS has unveiled a fundamental limitation in balancing between education and training, and qualification system, even though it has achieved remarkable outcomes in terms of total number of successful candidates. The root cause of the issue was the gap between National Technical Qualification (NTQ) and TVET, and industrial needs, which has caused ineffectiveness of the system. As one of the solutions for this problem, the National Competency Standards (NCSs) were introduced, establishing industry-led TVET and qualification system. In this context, this paper covers strengths and weaknesses of quality assurance of the TVET qualification process, as well as opportunities for and barriers to improving the present quality assurance process in Korea. Additionally, issues related to how quality assurance in Korea should be adapted to respond to regional development are included. Finally, this paper contains the suggestions and proposals for improving quality assurance of qualifications in Korea.

Keywords: Quality Assurance, Qualification Process, NTQS, NCS, industry-led TVET and qualification

1 Introduction

1.1 National context

In the education sector, Korea has rapidly expanded provision of education over the last half century, achieving universal education in primary, lower secondary and upper secondary education reaching almost 100% of participation and completion rates for each level. The legal minimum school leaving age is 16, securing the primary and the lower secondary schooling to all by setting them as compulsory education. Advancement rate from upper secondary to higher education is as high as about 70.8% - such a high entrance rate is often attributed to low recognition of TVET (KRIVET 2016).

TVET in Korea has been stigmatized due to the historical legacy of Confucianism which stressed academic value over practical skills. Fortunately, with economic crisis in 1997 and increasing real unemployment rate of college graduates reaching 12.5% in Feb. 2016 from a viewpoint of real unemployment rate (Statistics Korea 2016), the public recognition of TVET has much improved while the value of college diploma has decreased. The value of voca-

tional qualification was at a peak in the 1960s with rapid economic development, but has plummeted as higher education was almost universalized. Currently, it is expected that people's recognition of vocational qualification will increase significantly since National Competency Standards (NCSs) and National Qualification Framework (NQF) are considered as essential infrastructure to establish a competency-based society.

To recapitulate briefly, Korea has achieved dramatic progress in its economic and educational development over the last half century, but there are new challenges emerging as the demographic projection indicates decreasing youth population while youth unemployment rate reaches a record high. This turnaround situation provides Korea with a chance to highlight the value of TVET, which has been relatively marginalized in the economic and educational development history of Korea.

1.2 General overview of the TVET system

Korean TVET can be divided into two categories: vocational education and vocational training. The vocational education, managed by the Ministry of Education (MoE) is composed of two key components: 1) technical high schools at upper secondary level, and 2) 2-4 year-vocational colleges at tertiary level. Currently there has been discussion to move the education of teachers, engineers, lawyers and accountants in the four-year university into the vocational education category.

The quality assurance of TVET in Korea has taken various measures (The relevant Korea Ministries, 2005). The MoE controls quality of TVET by adapting national curriculum to the upper secondary vocational education institutes and by implementing specialized projects for the junior colleges. Operating with the national curriculum, these institutes and colleges are evaluated using various indicators including employment rate. The Ministry of Employment and Labour (MoEL) is stepping up efforts to raise quality of vocational training institutes by adopting national vocational training standards. The vocational training institutes are evaluated by the MoEL on an annual basis. This evaluation system sets the institutes with three levels of accreditation – 1) accreditation given for three years, 2) accreditation effective for a year, and 3) pending decision. This three-level evaluation system was converted from the previous five-level system.

Recently, the program-based qualification system, connected to the NCS, was introduced into the technical high schools, junior colleges and some four-year universities. The policy trend of strengthening ties between vocational education and vocational training was bolstered with the extensive reform of vocational training institutes by implementing the NCS-based vocational program. This policy gained momentum with a growing recognition of the importance of learning outcomes, rather than input-based education and training, which was reflected in the NCS based TVET system. NQF, which is in the process of establishment, plays an important role in facilitating this reformation movement as it is expected that the qualifications of TVET will be incorporated in the NQF.

2 Evolution of quality assurance development in TVET

In 1973, the government enacted the National Technical Qualification Act (NTQA) to meet the demand of establishing a comprehensive National Technical Qualification (NTQ) management system, previously dispersed among different ministries and departments. Since 1973 the comprehensive NTQ system has been maintained. The NTQ has been criticized for its lack of flexibility to meet the industrial demand, although it has been changed to fit into the industrial transition (The Relevant Korea Ministries 2005). It was widely understood that this failure stems from the government-led NTQ system, which failed to adopt the market driven approach. The NTQ has been revitalized with the introduction of NCS and reform of NTQ, but its coverage has decreased compared with its initial condition. The industry driven NTQ has been strengthened as the government policy direction was changed. It is expected that the TVET quality assurance system will be much improved by the NTQ in the near future.

After the introduction of NCS in 2013, around 600 new NTQs have been developed and NCS-based NTQ has been implemented. This is expected to be a significant step forward leading to genuine industry-led NTQ. Also, it is notable that the NCS-based and program-based qualification has been adopted by the TVET institutions. Based on the NCS, the new NTQ was developed for packaging jobs and tasks required in the industrial field. Currently, 13 Industry Skills Councils (ISCs) in the areas of mechanic, software, material, marine and shipbuilding industries, among others, are playing an important role in making NTQ items (MoEL 2016a; HRD Korea 2015b).

Since 2015, the NCS-based and program-based qualification has been adapted to the craftsman level of NTQ in the technical high schools and vocational training institutes, being extended also to the second level of craftsman and industrial engineer (technician) in 2016. In the same year, the number of participants reaches about 3,400 in 129 programs (see Table 1).

Table 1: The program-based qualification in Korea (2016)

Level at NTQ	Number of Programs	Number of People
Craftsman	Hair, Welder, computer application machinery drawing, electronic CAD, electronic instrument, chemical analysis, mold etc.	1908
Industrial Engineer (Technician)	Welder, machinery planning, production automation, precious measure, computer application process etc.	1570
Total	129	3478

Source: MoEL (2015). Finalization for program-based education and training program. Sejong, South Korea

The NTQ has two qualification types. The first type follows the existing NTQ; the second one adopts NCS-based new qualification. Both are expected to be merged into a single qualifica-

tion system in the first half of 2017 (HRD Korea 2016). Also, there are two ways of implementing testing. The first is adopting the conventional written and performance tests; the second is certifying successful candidates who have completed the NCS-based course, which is described in Section 4 of this report. It is expected that the two ways of testing will coexist for the time being.

3 Governance of quality assurance in TVET

The management and operation of the National Technical Qualification System (NTQS) is legally bound to the NTQA, and mainly administered by MoEL. There are also 18 ministries and agencies participating in utilizing qualifications related to their working scope, each with a real ownership of each National Technical Qualification (NTQ) according to their respective business act. Based on the NTQA, the division of labor and scope of coverage among the 18 ministries and agencies and the MoEL were clarified. The qualification test of NTQ, working as a major enforcement tool of the qualification system, has been implemented by both HRD Korea, public awarding body sponsored by the MoEL, and the Korea Chamber of Commerce and Industry (KCCI), the private awarding body representing employers in charge of certifying service sector qualifications.

In other words, the main players operating the NTQS are the MoEL, 18 ministries and agencies, and two main awarding bodies, namely HRD Korea and KCCI, which are regulated by the NTQA (see below Figure 1). Korean NTQA has been comprehensively dealing with the national qualifications belonging to technical and technological fields since 1973. The NTQA which was designed to ensure efficiency and effectiveness of the qualification system during the rapid economic development period still seems to be able to manage and operate effectively a massive amount of qualification items (HRD Korea 2002).
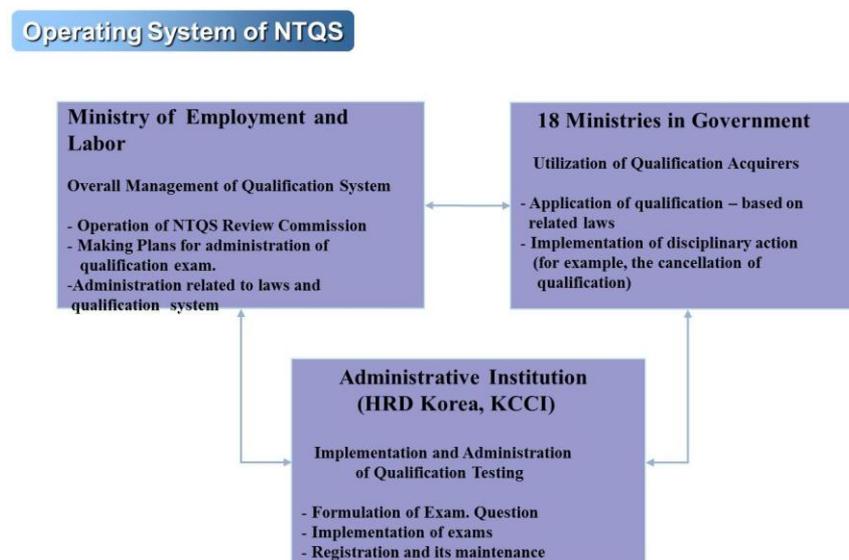

Figure 1:   Operating system of NTQS

4 Assessment underpinning qualification arrangements of learners and providers in TVET

Written, practical and interview tests are adopted as NTQ's major assessment methods (see Table 2). To supplement practical exam, a written exam of an essay or short answer type is prepared for the testing of relatively high-level qualification items. Industry experts, university professor, and teachers and trainers who satisfy the requirements for assessors can become assessors of practical tests.

Table 2:   Testing Methods of NTQ

Qualification Type	Testing Procedure	
	Written Exam (Write)	**Practical Exam or Interview (Say, Write, Create)**
Professional Engineer	Short answers or essay	Interview
Master Craftsman	Multiple choice (1 answer out of 4 choices)	Combined testing: Practical exam and written exam
Engineer	Multiple choice (1 answer out of 4 choices)	Combined testing: Practical exam and written exam
Industrial Engineer	Multiple choice (1 answer out of 4 choices)	Combined testing: Practical exam and written exam
Craftsman	Multiple choice (1 answer out of 4 choices)	Practical exam

However, there are two ways of testing currently - one is formal testing which adheres to the exam-based conventional way, and the other is the program-based qualification, introduced by reformed NTQS following the introduction of NCS:

The assessment of the program-based qualification has two types of internal assessment and external assessment implemented by HRD Korea. The HRD Korea, as public awarding body supported fully by MoEL, invites industry experts to become assessors for its external assessment.

In the accredited training institutes, NTQ qualification is given only to the trainees who obtain an average score of 80 in the external assessment led by HRD Korea and internal assessment arranged by the training institutes (Decree of NTQA, article 20-2). The HRD Korea appoints field experts as assessors of external assessment. The assessment is composed of the two stages of written test and practical test. The internal assessment is implemented by individual training institutes, which upload the assessment results to the database system. This qualification process is considered to be more difficult than conventional way of exam-based testing as it has shown lower pass rates.

5 Strengths and weaknesses of quality assurance of the TVET qualification process

5.1 Strengths

Quality assurance of TVET in Korea has been mainly led by the government since the 1960s, and now this system is sustained by two quality assurance systems:1) National Technical Qualification (NTQ), and 2) Private Qualification System (PQS). Referring to Table 3 below, the former has its legal basis originating from NTQA whose coverage reaches the entire TVET system including quality control of engineering education.

Table 3: Areas of TVET covered by the qualification type

National Technical Qualification (NTQ) based on National Technical Qualification Act	Private Qualification (PQ)	
	Authorized PQ based on Qualification Fundamental Act	In-firm qualification based on Employment Insurance Act
3-year technical high school (post-secondary level) Vocational Training institute (1-year) 2-year or 3-year junior college (including Korea Polytechnics) 4-year engineering university	3-year technical high school 2-year or 3-year junior college	61 companies and institutions with 115 qualifications (including Samsung Electronics, LG Electronics, etc.)

Private qualifications consist mainly of authorized vocational qualifications and of in-firm qualifications. The legal basis of the former is the Qualification Fundamental Act (QFA) mainly adapted to the education field, while the latter is under the coverage of Employment Insurance Act (EIA). Sixty-one companies follow the rules of this act, which also works as a quality assurance mechanism of in-firm vocational training. Both qualification systems cover formal and non-formal learning outcomes.

Initially, the authorized Private Qualification (PQ) was introduced with intention to assure the quality of PQ market. Through this system, the government controls the quality of private qualifications by authorizing highly qualified PQ providers. The authorized PQ providers receive equivalent legal status to the NTQ, thus giving them an advantage in the vocational qualification market. The major authority controlling this private qualification system is the MoE, but each ministry manages their own private qualifications in their areas of specialty.

In-firm qualifications, governed by the MoEL were initiated in an effort to meet the demands of individual companies, which cannot be properly met by the NTQ. This is geared toward providing qualifications to the unique and highly specialized jobs in individual firms.

As mentioned above, TVET system in Korea has been regulated by national and private qualification systems, leading to benefits such as better transition to companies and increased salaries, which are recommended by NTQ Act. In the early 1970s TVET capacity was not sufficient to provide opportunities for school-leaving students, workers and the unemployed, who wanted to join TVET. In that context Korean government (Ministry of Labour) established NTQS, giving these groups of people chances to acquire job skills needed in the labour market and develop their career consistently through qualification ladder from craftsman to professional engineer or master craftsman. For example, in the 1970s when the construction sector boomed in the Middle East countries, workers who wanted to be dispatched should acquire the NTQ certificate that was one of the requirements to be selected as qualified workers (Cho 2016).

This kind of policy, originally required by Middle East countries, had made necessary the activation of NTQS. From 1973 to 2015, the total number of candidates for NTQS reached more than 80 million, of which successful candidates were more than 21.8 million, and average pass rate of NTQ testing was about 27% during the whole period. More than 1.5 million candidates at least are applying for NTQ testing every year. Considering these outcomes of NTQS during the last 43 years, it can be concluded that NTQS has gained a large popularity among the general public (Cho 2016).

However, over the last 3 years, the present government has massively transformed the qualification as well as the education and training system in Korea by adopting outcome-based education and training. Also, the Korean government has been developing the NQF; some occupational fields such as IT, beauty, hotel, and etc. have already developed SQF and are ready to operate. 843 NCSs have been developed - including more than 10,000 units of standards, and adopted to the education and training programs at technical high school and 2-3 year junior colleges mainly. More than 600 NCS-based technical qualification items have been developed since early 2015; the quality of the education and training system has been assured based on the learning outcomes, by introducing a program-based qualification system to the NCS-based education and training. The MoEL has established 13 ISCs since 2013, promoting the NCS-based quality assurance activities, led by industries (MoEL 2016b).

5.2 Weaknesses

Even though NTQS is winning a big popularity, application to the labour market still has limitations due to the lack of industry participation. To overcome this situation fundamentally, the Korean government had decided to develop NCS and NQF, focusing on the establishment of an industry-led system. Although policies related to NCSs are continuously being implemented in TVET institutions and are strongly supported by the government, there are low recognition and understanding regarding the new concept of quality assurance system, which is based on the NCS-based learning outcomes. These phenomena are mainly caused by a shortage of national and social infrastructure to support and lead changes in higher and post-secondary education, labour market and incentive system, triggering a transformation of education, training and qualification system with the learning outcome - based approach (Cho

et al. 2015). Fast development and application of NCS requires prerequisites to implement NCS-based curriculum adequately. For example, the establishment of close cooperation system between school and company, and outcome-based assessment system, backed by competent teachers and professors with new mindset in favor of NCS and supported by new tools and equipment necessary for learning in school which should be prepared in advance. Yet, readiness in educational institutes is running behind, resulting in a number of complains as well as cold feet against NCS policies. Regarding cooperation among big stakeholders, it is also difficult to secure harmony with other relevant ministries, industries and education and training institutes, as the learning outcome-based quality assurance system was adopted. The dominant power groups such as universities, who have taken advantage of the existing system, are reluctant to accept the new system (Cho 2015). They think that NCS should be applied to only vocational training and below university level with respect to education hierarchical structure. Now that a group of reform packages including the NCS, NQF, and SQF has not been internalized by many stakeholders, the government (MoEL and MoE) is providing massive incentives. From the political aspect, Korean government is putting much pressure to produce visible outcomes in a relatively short period of time, though internalization of imported systems such as NQF, SQF and NCS requires more deliberation and time. This tradition originating from 5-year president's term in office has partly hindered the soft landing of NCS-related policies, requiring long-term planning and implementation.

6   Opportunities for and barriers to improving the present quality assurance process

6.1   Opportunities

As a policy measure to accomplish national and social visions of establishing a competency-based society, NCS, NCS-based qualification and NQF became major national agenda and policy priorities. This brought an advantage in securing national budget, gathering huge policy momentum – this seemed to be possible because many NCS and NQF experts were invited to a presidential committee raising their voices for this policy change. Aligned with this effort, TVET and qualification policy under the MoEL and the MoE was adjusted toward NCS, NCS-based qualification and NQF, speeding up the policy process and transformation.

However, it is also true that it may require more time to internalize changing concepts and structures to the working and mid-level personnel affected by this new policy measure. Time is limited before the end of this presidential period in early 2018 to produce tangible policy outcomes. Thus, the current government puts more effort to make positive results, which seem to be essential in securing the policy continuity after the cabinet change. The government understands that adoption of NCS-based qualification by corporations for their employment, promotion and transfer affairs is a key for the policy success. Also, NCS-based qualification is considered to be critical for the positive social recognition on effectiveness of the new qualification system and improving its system with structured internal and external assessment.

With these measures, the government now expects that industry-led NCS will produce learning outcomes that can be highly appreciated in workplaces (Cho et al. 2015). Up until now, it has been observed that the NCS-based qualification was not widely accepted as much as the program-based qualification. Given this situation, the government scales up its effort to promote competency assessment system, designed to assess the candidate's practical ability required to perform the tasks in workplaces. Since 2015, this system has been adopted by the public organizations and enterprises as a model case. Such effort by the government is considered to bring about a synergetic effect on policy designs for the establishment of a NQF and SQF, which will have a quality assurance function on various qualifications.

At present, the four qualification areas of software, hairdressing, hotel management, and automotive maintenance are close to the final stage of SQF development with their final draft. For the NQF development, the NQF development council was established under the committee of NCS operation, mandated to finalize the development of NQF. Both the NQF and the SQF are designed with special emphasis on the alignment of education, training, qualification and Recognition of Prior Learning (RPL), expecting them to work as strong policy instruments assuring quality of the NQF and SQF registered qualifications.

As already described, the government is ready to provide more policy momentum and required resources to introduce quality assurance system for the learning outcome-based education, training and qualification system.

Now that the newly developed NCS is competency-based, it is possible to establish a quality assurance system with learning outcome perspective. A series of recent reformation policies articulating to achieve advanced industry-driven competency-based education, training and qualification system based on NCSs, provides momentum to improve the quality assurance process.

As youth unemployment was raised as a serious social problem, the reformation movement toward restructuring the labor market and social incentive system with learning outcome perspective has received more social interest and policy support. For example, more than 100 public companies recently changed their traditional employment way to an NCS-based method, leading to reform of learning that happens in schools and universities which is shifting towards being learning outcome-based (HRD Korea 2016).

6.2   Barriers

Even though NCS and NQF-related policies as national agenda in this current government are gaining positioning effects, we are facing with some of barriers as follows:

- − Human, material and financial resources are not sufficient to sustain NCS-based curriculum reform in technical high schools as well as junior colleges and universities, even though it was initiated in 2014.

- The teacher to student ratio needs to be adjusted to about 1:20 to realize viable NCS-based education and training condition, comparing to current ratio, of about 1:30.9 at post-secondary school level (KEDI 2015)

- The overall curriculum reform to a learning outcome perspective makes changes to learning contents and evaluation methods inevitable. Teachers and trainers also need to be equipped with competency which is commensurate with the changed education and training system. It will require considerable efforts and energy to transform the current curricula into NCS-based.

- Establishing close ties between industries and education and training institutes, which seems to be essential infrastructure to make students achieve competencies required by the NCS system, remains a challenge. Current industry and school collaboration system should be improved and complemented by implementing NCS and NQF-related policies. For example, the Ministry of Labour has been implementing Korea Work-learning parallel system similar to the German dual system since 2014, and also the Ministry of Education has initiated the Korea Apprenticeship program from 2016 (MoEL 2016b).

- Higher education institutes are not proactive in adopting learning outcome-based curriculum and establishing its delivery system. But some vocation-oriented universities such as middle and low level universities from the perspective of social reputation are willing to adapt NCS and eager to change their curricula to be based on NCS.

- Training opportunities of competent assessors for the learning outcome-based assessment in the new quality assurance system need to be expanded. Due to lack of resources and time, assessor trainings are not provided sufficiently to meet the demands of education and training institutes.

7 Adaptation of quality assurance to regional contexts and developments

The Korea quality assurance system based on learning outcome (or NCS) perspective needs to be well-coordinated with the regional and international development of quality assurance systems. When reforming input-based education and training system, Korea pays lots of attention to international and regional quality assurance standards because the country needs to establish a quality assurance system prevailing domestically as well as internationally.

However, Korea has just started reforming its education, training, and qualification system, based on NCS, so it needs to share experience with countries such as Australia, Hong Kong China, and Malaysia, etc., which have already established and implemented the learning outcome system, based on NCS. Also the collaboration with international organizations such as UNESCO, ILO, etc. is important for Korea to reflect on the regional and international perspective while putting the learning outcome system in place.

I consider the role and function of international organizations as catalyst in terms of facilitating collaboration between countries, which are also very important to spread out the best

examples to member countries. In this context UNESCO puts more energy to share experience between member countries accompanying with efforts to make international or regional quality assurance standards.

Especially in Southeast Asia region many member countries are not equipped with the quality assurance system based on NCS because the development of NCS and its application to education, training, and qualification system is considered challenging and requiring massive resources and efforts. But some countries are trying to change their existing education and training to reflect NCS, cooperating with developed countries, which are willing to provide ODA (Official Development Assistance).

In this context Korea is now expanding cooperation with Southeast Asian countries, sharing its experience of the newly-established outcome-based quality assurance system with other countries in this region. This will be helpful for Korea and recipient countries to share experience, leading to creation of new knowledge for both sides.

If Korea wishes to become the best example of NCS-based quality assurance in this region, we should continuously upgrade our NCS-based quality assurance system. For this purpose, the tasks that should be taken could be summarized as below:

- Establishing learning outcome-based assessment system completely;
- Establishing program-based assessment as one of the measures to promote learning outcome-based quality assurance system;
- Creating necessary preconditions for the implementation of program-based qualification by expanding assessor's qualification;
- Establishing and implementing NQF, SQF as a way of adopting the learning outcome-based assessment system.

Meanwhile, member countries' qualification could be improved and renovated by promoting the benchmarking and mutual recognition agreement (MRA) of qualifications between regional partnering countries, it is expected that benchmarking and MRA process could be a good platform to improve each country's qualification because it requires a comprehensive assessment of each country's qualifications in terms of learning outcomes, leading to the comparison of qualification items in detail. The Southeast Asian region has AQRF as regional qualification framework (RQF), which is a useful platform to reach MRA between countries, based on each country's NQF. In this context the establishment and operation of NQF based on NCS in each country should receive more attention to achieve alignment with RQF.

8 Suggestions and proposals for improving quality assurance of qualifications

Regarding the improvement of quality assurance of qualifications, it is critical to involve employers and trade unions actively to the management and operation process of industry-led TVET and qualification system. As NCSs are mainly developed by industry experts, industry

participation in the education, training and qualification system in Korea has been systemized. In order to establish the industry-led NCS and qualification development system, the MoEL has already installed 13 ISCs in order to cope with ever-changing industrial demands. Quality assurance of qualifications with an aim to meet industry demands is the key to make qualification items trusted and valued by the labour market. In this context it is very important for the Korean government to pursue proactive policy measures, bolstering ISC's function to make industry participation in education and training, and qualification system stable and active.

In parallel with active engagement of industry, Korea makes efforts to do the following (HRD Korea 2016):

− Establish learning outcome-based assessment by implementing NCS-based national technical qualification testing system such as program-based assessment, applying NCS-based new qualification testing system to upper-secondary technical high school, junior college, and university etc.;

− Develop and implement NQF and SQF, guiding outcome-based assessment and reforming labour market tradition such as improvement of seniority system;

− Prepare infrastructure to reform the existing TVET and qualification system to competency-based one, by changing regulations which enable the massive investment of national energy;

− Expand and deepen the necessity of NCS-based qualification by national promotion to the public at large scale. This attempt could be reinforced to secure comparability with advanced countries' qualifications.

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