

Working Paper 15/2026

# Assessment of Skills Development and Utilisation at Origin

Mary Boatemaa Setrana  
Justice Richard Kwabena Owusu Kyei  
John Narh  
Joseph Teye

Centre for Migration Studies, University of Ghana

<http://link4skills.eu>



The Link4Skills project has received funding from the European Union's Horizon research and innovation programme under grant agreement number 101132476

The research leading to these results has received funding from the European Union's Horizon Europe project call HORIZON-CL2-2023-TRANSFORMATIONS-01 grant agreement 101132476.

The author is solely responsible for its content, it does not represent the opinion of the European Commission and the Commission is not responsible for any use that might be made of data appearing therein.

To cite: Prepared by Mary Boatemaa Setrana, Justice Richard Kwabena Owusu Kyei, John Narh and Joseph Teye, Centre for Migration Studies, University of Ghana, *"A report by the Centre for Migration Studies, University of Ghana in partnership with the Scalabrini Migration Centre, University of Ibadan, Association Migration Internationale in Morocco, International Institute of Migration and Development, University of Gadjah Mada and the Ukraine Catholic University"*, 2025

## **ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION in HEALTH, STEM AND CONSTRUCTION: A QUALITATIVE STUDY OF SEVEN ORIGIN COUNTRIES**

A report by the Centre for Migration Studies, University of Ghana in partnership with the Scalabrini Migration Centre, University of Ibadan, Association Migration Internationale in Morocco, International Institute of Migration and Development, University of Gadjah Mada and the Ukraine Catholic University

(Prepared by Mary Boatemaa Setrana, Justice Richard Kwabena Owusu Kyei, John Narh and Joseph Teye, Centre for Migration Studies, University of Ghana)

Date: 2025

## TABLE OF CONTENTS

<b>ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION in HEALTH, STEM AND CONSTRUCTION: A QUALITATIVE STUDY OF SEVEN ORIGIN COUNTRIES .....</b>	<b>1</b>
<b>ABSTRACT .....</b>	<b>6</b>
<b>Policy and Practitioners’ Recommendations.....</b>	<b>7</b>
Recommendations for Policymakers.....	7
Recommendations for Practitioners and Industry Stakeholders.....	7
Cross-Cutting Recommendations .....	7
<b>PART I: SYNTHESIS.....</b>	<b>9</b>
1.1 Introduction .....	9
1.2 Methodology.....	9
1.3 Training and Education in STEM, Health and Construction.....	10
1.3.1 Curricula Relevance and Graduate Quality.....	10
1.3.2 Strengths and Weaknesses of Curricula in Meeting Market Demands.....	12
1.3.3 Standardisation of Informal Training and the Challenges Encountered .....	13
1.3.4 Labour Market Demand and Supply .....	14
1.4 Migration of STEM, Health and Construction Personnel (from origin country) .....	19
1.5 Conclusion.....	22
<b>Part II: COUNTRY REPORTS .....</b>	<b>24</b>
<b>2.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION IN ORIGIN – GHANA .....</b>	<b>24</b>
<b>2.1 Training and Education in STEM, Health and Construction.....</b>	<b>24</b>
2.1.1 Curricula Relevance and Graduate Quality.....	24
2.1.2 Strengths and Weaknesses of Curricula in Meeting Market Demands.....	26
2.1.3 Standardisation of Informal Training and the Challenges Encountered .....	29
2.2 Labour Market Demand and Supply .....	30
2.2.1 The Skill Mismatch and Misinformed Selection of Programmes Studies.....	30
2.2.2 The Current Issue of Demand and Supply Strategies in Nursing, Construction and STEM.....	31
2.3 Migration of STEM, Health, and Construction Personnel.....	33
2.4 Conclusion .....	35
<b>REFERENCES .....</b>	<b>36</b>
<b>3.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – INDIA .....</b>	<b>37</b>
3.1 Training and Education in STEM, Health, and Construction .....	37
3.1.1 Health: Medical and Nursing Education .....	37

3.1.2 STEM: Engineering Education .....	38
3.1.3 Construction and Vocational Training .....	39
3.2 Labour Market Demand and Supply.....	40
3.2.1 Health .....	40
3.2.2 STEM.....	41
3.2.3 Construction and Vocational .....	42
3.3 Migration of STEM, Health and Construction Personnel.....	42
3.3.1 Health .....	42
3.3.2 STEM.....	43
3.3.3 Construction and Vocational .....	43
3.4 Conclusion.....	44
<b>4.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – INDONESIA.....</b>	<b>46</b>
4.1 Training and Education in STEM, Health and Construction .....	46
4.1.1 Curriculum Relevance and Graduate Quality.....	46
4.1.2 Strengths and Weaknesses of Curricula in Meeting Market Demands.....	47
4.1.3 Standardisation of Informal Training and The Challenges Encountered.....	48
4.2 Labour Market Demand and Supply.....	49
4.2.1 Skill Mismatch and Labour-Market Constraints.....	49
4.2.2 The Paradox of Nurse Surplus and Regional Shortage.....	55
4.3 Labour-Market Challenges in Indonesia’s Nursing Workforce .....	56
4.3.1 The Current Issue of Demand and Supply in Construction .....	56
4.3.2 Strategies to Promote Student Enrolment in Health, STEM, and Construction .....	57
4.4 Migration of STEM, Health, and Construction Personnel.....	58
4.4.1 Motivations to Migrate.....	58
4.4.2 Retention Challenges and Policy Gaps.....	59
4.4.3 Bilateral and Sectoral Agreements .....	60
4.5 Conclusion.....	61
<b>REFERENCES .....</b>	<b>62</b>
<b>5.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION COUNTRY – MOROCCO.....</b>	<b>65</b>
5.1 Training and Education in STEM, Health, and Construction in Morocco: Curricula, Labour-Market Alignment and the Standardisation of Informal Skills .....	65
5.1.1 Curricula and the Quality of Graduates in Health, STEM and Construction Health Sector .....	65
5.1.2 Strengths and Weaknesses of Curricula in Meeting Labour-Market Demands .....	66
5.2 Labour Market Demand and Supply.....	67

5.2.1 Health Sector: Structural Shortages and Recruitment Bottlenecks .....	68
5.2.2 STEM Sector: Surplus of Graduates and Shortage of Technicians .....	68
5.2.3 Construction Sector: From Surplus to Domestic Shortages .....	68
5.2.4/ Cross-Cutting Dynamics: Mobility, Mismatch and Governance .....	69
5.3 Migration of Personnel in the STEM, Health and Construction Sectors from Morocco	69
5.3.1 Health Sector: High Emigration Pressure and Persistent Domestic Shortages .....	70
5.3.2 Institutional Governance of International Recruitment.....	70
5.3.3 Retention Policies and Government Measures .....	71
5.3.4 Bilateral Agreements and Talent Partnerships .....	71
5.3.5 Towards a Structured Mobility Partnership.....	71
5.4 Market Dynamics, Bilateral Agreements and Ethical Governance .....	72
<b>SELECTED REFERENCES.....</b>	<b>74</b>
<b>6.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – NIGERIA.....</b>	<b>76</b>
6.1 Methodology.....	76
6.2 Training and Education in STEM, Health and Construction .....	77
6.2.1 Relevance of Curriculum to Labour Market.....	77
6.2.3 Need for Integrating Informal Training.....	81
6.3. Labour Market Demand and Supply.....	82
6.3.1 Skills Deficit among Graduates and Unemployment.....	83
6.3.2 Policy gap in attracting people into health, STEM and construction .....	84
6.4 Migration of STEM, Health and Construction Personnel (from origin country) .....	85
6.4.1 Motivation for Migration.....	85
6.4.2 Lack of Bilateral Labour Agreements (BLAs) and MOUs .....	86
6.4.3 Lack of Policy or Incentive to Avoid Brain Drain .....	87
6.5 Conclusion.....	88
6.6 Recommendations .....	88
<b>7.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – PHILIPPINES</b>	<b>91</b>
7.1 Introduction .....	91
7.2 Training and Education in the Philippines .....	92
7.2.1 Technical and Vocational Education and Training .....	93
7.3 Training and Education in STEM, Health and Construction .....	97
7.4 Labor Market Demand and Supply.....	99
7.4.1 Demand and Supply in STEM, Health and Construction .....	100
7.5 Conclusion.....	104
<b>REFERENCES .....</b>	<b>105</b>

<b>8.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – UKRAINE .....</b>	<b>106</b>
8.1 Training and Education in STEM, Health and Construction .....	106
8.1.1 Alignment of Curricula with Labour Market Demands .....	106
8.1.2. Strengths and Weaknesses of Curricula.....	107
8.1.3. Standardisation of Informal Training and Certification.....	108
8.1.4. TVET–Industry Partnerships.....	108
8.2 Labour Market Demand and Supply.....	109
8.2.1 Skill Mismatch and Graduate Unemployment in Health, STEM, and Construction .....	109
8.2.2 Paradox of Nursing Graduate Growth and Health Workforce Shortages .....	110
8.2.3 Demand and Supply in Health, STEM and Construction .....	111
8.2.5 Enrolment and Workforce Projections, Data Systems and Policy Coordination ....	113
8.3 Migration of STEM, Health and Construction Personnel (from origin country) .....	114
8.3.1 How unemployment and conditions of service influence outflow .....	115
8.3.2 Existing retention policies and employer measures .....	115
8.3.3 Bilateral Agreements, Memorandum of Understandings and Ethical Considerations .....	116
8.3.4 Concluding observations and policy implications .....	117
8.4 Conclusion.....	117
8.4.1 Policy Directions: Migration Corridors and the “Triple Win” .....	117
8.4.2 Addressing the Shortage-Surplus Discrepancy .....	118
<b>KEY REFERENCES.....</b>	<b>118</b>
Appendix 1. List of interviews with stakeholders .....	119

## ABSTRACT

This report analyses the quality of education and training in STEM, health and construction across seven countries: Ghana, Nigeria, Morocco, Indonesia, India, the Philippines and Ukraine. It assesses the relevance of curricula and the quality of graduates in these seven countries of origin as part of the Horizon Europe Link4Skills project. Additionally, it evaluates the strengths and weaknesses of the curricula in meeting labour market demands. Furthermore, the report aims to unravel the motivation that drives skilled personnel to migrate and the retention packages designed to deter them from migrating. This report employed qualitative research methodology of in-depth interviews with experts, practitioners and policymakers in all the seven countries. The data revealed variations in the quality of education in these seven countries. In health education, nursing curricula effectively blend theory and practice, minimising the need for extensive on-the-job training after graduation. Meanwhile, STEM and construction education are predominantly theoretical, lacking sufficient practical training, which creates a gap between labour market demand and graduate supply. This emphasis on theory is true for most programmes except for some ICT programmes at the vocational level. This report recommends the creation of a platform that promotes multistakeholder engagement among policymakers, practitioners, and educational experts to stay current with curricula and market demands. Also, it identified that an avenue to enhancing the retention of skilled personnel can be achieved by adopting a holistic approach to employee wellbeing.

**Keywords:** Education quality, Curriculum, Labour market demand and supply, STEM, Construction, Health, Migration, Comparative study

## Policy and Practitioners' Recommendations

### Recommendations for Policymakers

1. **Address gaps in foundational skills:**
  - ◆ Improve basic skills in arithmetic (mathematics).
  - ◆ Strengthen computer literacy.
2. **Adopt a holistic approach to employee wellbeing to enhance retention skills:**
  - ◆ Balance salary with basic cost of living.
  - ◆ Offer incentivised remuneration.
  - ◆ Establish dignified pension plans and pension schemes.
  - ◆ Provide attractive packages for employees in deprived areas and rural communities.
3. **Invest in educational infrastructure:**
  - ◆ Allocate funds for renovating and upgrading outdated laboratories and experimental centres.
  - ◆ Make financial investments in educational materials.
  - ◆ Commit funds for the construction and improvement of educational buildings.
4. **Establish quality curricula:**
  - ◆ Conduct rotational and regular curriculum reviews through stakeholder engagement to address pressing developmental needs instead of the current four-year schedule.
  - ◆ Prioritise both the theoretical and practical elements of academic programmes.
  - ◆ Develop a clear transition pathway for formalising non-formal Technical and Vocational Education and Training (TVET) skilled workers.
5. **Implement ethical migration agreements:**
  - ◆ Establish bilateral agreements aimed at recruiting and upskilling newly trained workers rather than solely recruiting experienced skilled personnel.
  - ◆ Strengthen bilateral agreements between countries that attract most of the skilled personnel to ensure proper regulation of skilled personnel.

### Recommendations for Practitioners and Industry Stakeholders

1. **Bridge the gap between demand and supply:**
  - ◆ Industry players (employers) and educational institutions should collaborate to ensure that theoretical knowledge aligns with practical application through internships.
  - ◆ Establish collaborative programmes (involving schools, businesses and community organisations) such as mentorship opportunities, skill-building activities and feedback workshops to enhance the transition from school to the workforce.

### Cross-Cutting Recommendations

1. **Implement comprehensive health insurance policies: public-private partnership**  
Policymakers should encourage public-private partnership in the investment in healthcare. Citizens are encouraged to enrol in private health insurance policies to help lessen the financial burden on the government and to enlarge the intake of health professionals.

# 1.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION in HEALTH, STEM AND CONSTRUCTION: A QUALITATIVE STUDY OF SEVEN ORIGIN COUNTRIES

## PART I: SYNTHESIS

### 1.1 Introduction

This report presents a qualitative assessment of skills development and utilisation in health, STEM (Science, Technology, Engineering and Mathematics) and construction in seven origin countries. These countries include Ghana, Nigeria and Morocco in Africa; India, Indonesia and the Philippines in Asia; and Ukraine in Europe under the European Union (EU) funded Link4Skills research project. This research builds on a prior desk review of existing data on human resources in health, STEM, and construction across the seven countries mentioned above (Asis, Ducanes & Soco-Roda, 2025), which was part of the same EU-funded Link4Skills project. This report aims at exploring information across seven countries in three key areas: (1) the quality of training and education in STEM, health and construction; (2) labour market demands and the quality and quantity of graduates from accredited institutions; (3) drivers of migration. Understanding these three key areas in training and education are crucial in shaping the developmental agenda of these countries.

The research employed a qualitative research method utilising in-depth interviews with practitioners, experts and policymakers. These participants were from the seven origin countries across Africa, Asia and Europe. The research team comprised organisations from Africa: the Centre for Migration Studies at the University of Ghana; the Association Migration Internationale in Morocco and the University of Ibadan in Nigeria; from Asia: the International Institute of Migration and Development in India, the University of Gadjah Mada in Indonesia, and the Scalabrini Migration Center in the Philippines; and from Europe, the Ukrainian Catholic University in Ukraine. The data for each country were compiled into country reports.

This report is divided into two main parts. Part I comparatively examines the quality of training and education in STEM, health and construction in the seven origin countries. Furthermore, it compares labour market demand and supply, as well as the challenges encountered, and examines the drivers of migration across all seven countries. Part II presents the individual country reports of the seven origin countries, providing a holistic understanding of the country-specific situation.

### 1.2 Methodology

The individual country reports which form the basis for this synthesis were based on empirical qualitative studies in the respective countries. All the country teams reviewed existing academic materials, government documents, and data. In addition, all the country teams conducted interviews with several relevant stakeholders (See Appendix I) to provide a qualitative assessment of educational and training structures and human capital formation in their respective countries. With the informed consent of the research participants, the

qualitative interviews were recorded, and the audios were transcribed into textual data. The transcribed data were subjected to content or thematic analysis.

This synthesised report (Part I), draws mainly on the country reports. The researchers read all the individual country report to identify common and/or differing themes, patterns for a general overview while identifying nuances. The synthesis is then presented, drawing on the commonalities, and differences among the country reports.

### 1.3 Training and Education in STEM, Health and Construction

#### 1.3.1 Curricula Relevance and Graduate Quality

The curricula and training frameworks of STEM, health and construction have undergone various forms of transformation to address gaps and enhance the quality of education in meeting market demands in Ghana, the Philippines, Nigeria, Ukraine, Indonesia, India and Morocco. The alignment of various forms of training with specific government institutions that have legal mandates is fundamental in all these countries. In the Philippines, the Commission of Higher Education (CHED) and the Technical Education and Skills Development Authority (TESDA) are government agencies responsible for tertiary education and technical and vocational education, respectively. In Ghana, the Ghana Tertiary Education Commission (GTEC), the Commission for Technical and Vocational Education and Training (CTVET) and the Nursing and Midwifery Council (NMC) are governmental bodies responsible for tertiary education, technical and vocational education and nursing and midwifery education, respectively. An employee of CTVET recounted that:

*Yes, it is not only ICT but for all technical and vocational education and training (TVET) programmes. CTVET approves the curriculum and all that and manages the institutions. The service must ensure that all the requirements are met by accredited institutions. CTVET conducts monitoring and enforcement. We make sure that, as per what they came for accreditation, that is exactly what they are doing. So, that is the arrangement (L4S\_Gh\_prac\_06).*

In the Philippines, it was noted that the framework for skills training and education in the Philippines is largely overseen by three government agencies: i) the Department of Education (DepEd) for basic education; ii) the Commission on Higher Education (CHED), for tertiary education; and iii) the Technical Education and Skills Development Authority (TESDA), for technical and vocational education. The DepED, CHED, and TESDA, together with the Department of Labour and Employment (DOLE) and the Professional Regulations Commission (PRC), comprise the PQF National Coordinating Council (PQFNCC).

Although the mandated institutions seek to ensure quality education, the reality reveals variation in the standard of education offered by each curriculum in the countries studied. According to the data, the quality of nursing and midwifery training ranks highest in all the origin countries due to the intrinsic blending of the theoretical and practical elements. A nursing educator in Nigeria explained:

*For us in the Nursing Faculty, that is why we have the internship. So, you bridge the gaps between theory and practice. Some of the things you*

*taught them using simulation, now they're graduates, they must touch the patients (L4S\_Ng\_Prac\_09).*

In an interview with some Indonesian graduates, one interviewee stated:

*I think the curriculum is sufficient because in the bachelor's programme, we mainly study theory, while the nursing programme is fully practical, similar to an internship. We interact directly with patients for a year, which I think is enough time [own translation from Bahasa Indonesia] (see L4S\_ID-AT\_Migrant\_01, p.3, line 31-33).*

A faculty member from Indonesia highlighted the importance of clinical practice in nursing education:

*Clinical postings occupy the majority of the daily schedule, usually from morning to afternoon, and students spend much of their time in the wards and clinics... Clinical exposure is where real acumen is built: students learn how to deal with cases, conduct physical examinations, and interpret symptoms (L4S\_IN\_exp\_3).*

The structured theoretical studies combined with clinical training and licensing requirements make nursing training one of the few disciplines in the countries studied where graduates are ready to enter the labour market without needing additional training. That notwithstanding, nursing educational programmes are not able to match the pace of modernisation in healthcare. It was noted in Morocco and in almost all the other countries studied that clinical exposure is often limited by overcrowded student populations, insufficient supervision and a shortage of specialised equipment.

Construction and STEM fall short of the theoretical-practical process of training and education due to significant gaps that persist between training content and industrial needs. The data showed that in Ukraine, educational institutions rarely offer programmes focusing on energy-efficient technologies and sustainable construction, which constrains employers from embarking on providing on the job training for employees. One interviewee from Ukraine highlighted the gap between the qualifications provided by educational institutions and the needs of the job market in the statement below:

*Very often, developers have to find specialists on their own, as educational institutions do not currently offer programs or provide the knowledge required for these specialties (L4S\_transcript\_UA\_pol\_4).*

Similarly, data from Nigeria confirmed that graduates in construction are failing to meet expectations, due to inadequate practical and hands-on training and outdated curricula that are not aligned with current global and local market needs. An informant from Nigeria's employers' association stated:

*It (construction) often focuses more on theory than practical skills. The content of the current curriculum that we have mostly doesn't reflect current industry trends, especially in terms of technologies and innovations. The curriculum is not*

*sufficient. Perhaps we can say they are obsolete, they are outdated, and there's a need to improve on the curriculum to review and improve on it to meet the current realities (L4S\_Ng\_Prac\_07).*

Confirming the inadequate practical skills in construction education, an Indonesian expert said:

*According to our mapping at the Ministry of Manpower, there's a clear gap between the education system and the labour market. For example, someone who graduates with a bachelor's degree in engineering may still not be ready to enter the workforce. They need upskilling through training institutions. This is something we must address. There needs to be a strong link and match between education and the labour market. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p. 6, line 7-14)*

The absence of educational infrastructure and equipment contributes to the absence of practical training in graduate studies. The limitations of existing engineering laboratories in equipping graduates with practical experiences contributes to the gap in skill acquisition.

### **1.3.2 Strengths and Weaknesses of Curricula in Meeting Market Demands**

The data showed that all the countries studied have a strong theoretical foundation in their curricula and training. It was noted that curricula in bachelor programmes were more theoretical and sometimes did not meet market demands as much as vocational programmes, except for medicine and nursing, which balanced theory with practice to readily meet local market demands. An expert from India explained:

*Clinical postings occupy the majority of the daily schedule, usually from morning to afternoon, and students spend much of their time in the wards and clinics... Clinical exposure is where real acumen is built: students learn how to deal with cases, conduct physical examinations, and interpret symptom (L4S\_IN\_exp\_3).*

The practical skill development approach by diploma vocational programmes in STEM and construction provides graduates with high employability rates in the local markets. Bachelor's degree holders in similar fields typically need to pursue training certificates and costly external courses to enhance their readiness for the local labour market, due to the relatively weak practical component in their curricula. A CTVET official from Ghana stated that the ICT curriculum and teaching methods align with industry needs. This CTVET official said:

*We issue a certificate which industry acknowledge as being fit. These are the reasons why we are sure the curriculum is relevant to the needs of industry. If somebody needs to service their laptop or something, even if that is the only unit you have learnt, then*

*of course, you are useful in that regard and you can make money out of that. So, we make sure that these standards translate into the units to train the people. So, we have the learning materials developed by the industry and do competence-based training (L4S\_Gh\_prac\_06).*

The Philippines ensures that TVET qualifications are practical and respond to the needs of industry. As such, the Technical Education and Skills Development Authority (TESDA) has implemented an Area-Based and Demand Driven (ABDD) approach and ‘granularisation priorities’ system intended to provide workforce for local industries. A Philippines’ TESDA official noted that:

*If the skills mapping and industry consultations show that, for instance, in baking, 500 graduates are needed this year, TESDA has to produce that number for the year in all the schools that carry baking programs. So that when the 500 graduate, there is an available workforce for the area (TESDA 11).*

A weakness identified was the interval of curricula review. Although the origin countries in this study have a 4-year average period for curriculum review, the industrial needs seem to overtake this time period, thereby creating a knowledge-industrial gap. On revision cycles and responsiveness, a department head from India explained:

*Roughly, every four years, there is a change or update. But it doesn’t always happen on time... another revision is in progress (L4S\_IN\_pra\_3).*

An official from CTVET in Ghana also indicated how the interval between review of curricula of programmes is relatively long, which makes it difficult to readily adapt to labour market demands:

*The norm is that curricula are reviewed 3 to 5-year periods, I think that with ICT the review sessions must be much faster. That would also mean that there would be a need for consistent resources. If every 3 to 6 months, new things are coming up, then we need to keep up with that pace. There is a need for constant review and updates in the new technologies that are coming up (L4S\_Gh\_prac\_06).*

The frequent renewal of curricula is generally a recommendation by experts in the studied countries. They, however, acknowledge the cumbersome, complicated and bureaucratic processes laid down during the renewal of the curricula. The matching of content with market demands is a challenge that educational institutions deal with in producing quality graduates with the limited resources available to them.

### 1.3.3 Standardisation of Informal Training and the Challenges Encountered

Informal training in the various fields continues to flourish in the different origin countries, but efforts are being made by private and public entities to standardise their training so as to enhance productivity and efficiency. According to the data, government agencies are making the effort to regulate and standardise the training of informal skilled workers in nursing,

construction and STEM. A Ghana Institute of Engineering official explained how the Ghana Institute of Engineers (GHIE) embarks on training programmes for craftsmen to standardise their operations:

*For the craftsmen too, for the past 5 years, we had training for them. I have conducted some training for them in the areas of concrete and iron rods. These are materials used in the construction industry. We had training in the Ashanti, Northern, Upper East, Greater Accra, and the Western Regions. The main purpose was to formalise their front and trying to imbue the sense of professionalism in them (L4S\_Gh\_prac\_08).*

A Ministry of Manpower director from Indonesia explained:

*Due to the gap between education and employment, the Ministry is pushing for stronger roles for vocational training centres like BLK and LPK. Even many SMK (vocational high school) graduates are not job-ready, so we bridge this gap through vocational training. [own translation from Bahasa Indonesia] (L4S\_ID\_pol\_01, p.11, line 15-20)*

In the Philippines, it was noted that most individuals who pursue caregiving courses are either returning from abroad to upgrade their skills and obtain certification or are about to migrate. Additionally, there was a significant increase in enrolment in TESDA programmes in construction, particularly in carpentry, painting, masonry, and heavy equipment operation and servicing. Moreover, TESDA provides various standardised STEM courses, as recounted by a TESDA official below:

*While TESDA does not classify specific courses as STEM, high completion rates - 80% to more than 90% - can be seen in courses with STEM elements such as agriculture, automotive and land transportation, chemicals, electrical and electronics, heating and ventilation, ICT, metals and engineering, and utilities (TESDA 30)*

It was also noted that some institutions run programmes especially for skills in STEM and construction, such as ICT, carpentry, welding and masonry. Unfortunately, some of the certificates issued lack national recognition, making it impossible to validate these certificates and hindering their potential employment at a level appropriate to their knowledge.

### 1.3.4 Labour Market Demand and Supply

This section focuses on analysing the labour market demand and supply situation in the Link4Skills' countries of origin. It highlights the irony of having a high number of graduates, while simultaneously facing a shortage of skilled personnel. It also discusses the perceived or projected dynamics and strategies needed to balance the demand and supply of health, STEM, and construction professionals in the countries studied.

In general, skill mismatch was identified in the data as fundamental in creating graduate unemployment in health, STEM and construction in the origin countries studied. Skill mismatch is the situation of imbalance between the skills of graduates and the requisite skills

of employers. In Ukraine, the data revealed that more than half of the registered unemployed persons hold higher education degrees which is not caused by overqualification but ‘over-diplomation’- a situation where individuals possess formal degrees but lack the applied competencies demanded by the economy. Although there is high formal educational attainment in Ukraine, actual professional competencies and labour market readiness are insufficient due to substandard course content, as an expert explains as follows:

*This may be an indicator of an oversupply of higher education diplomas among the population. People are not exactly overqualified; they are over-diplomated. It seems that in Ukraine, higher education is very accessible. In all public spheres, as in the post-Soviet system, it worked on the model of low quality and high accessibility (L4S\_UA\_pol\_1).*

In Nigeria, too, skill mismatch is a major challenge. One expert narrated that some people “have advanced degrees without any skills. So that’s what’s making them unemployed” (KII8/Male/Practitioner/Employers Association). Reports from the Philippines and Indonesia indicate that skill mismatch may be a contributing factor to unemployment, as many graduates struggle to secure entry-level jobs.

#### **HEALTH SECTOR (with focus on nurses)**

The countries are training an increasing number of nurses annually but the inability of the private and public sectors to absorb these graduates create unemployment. In these countries, the public sector remains the main employer and whenever the government has difficulties in generating or receiving funds, there is a freeze on employment. The Ministry of Health’s Human Resources Strategy (2025) in Morocco narrates that bottlenecks in recruitment explain the presence of unemployment among newly trained nurses and shortages in health facilities. According to a Ghanaian practitioner:

*In terms of health facility and financial space, no Ghanaian government currently can employ all the professionals that are churned out. So, definitely, we are going to have backlog of nurses (L4S\_Gh\_prac\_07).*

Thus, being the leading employer of health professionals, especially as health is largely considered as a public good, the government’s inability to expand health facilities and employ more health professionals contributes to unemployment in the sector. In Indonesia, India and the Philippines lack of fiscal space for employment or lack of incentives creates shortage of health professionals in some parts of these countries. For instance, in Indonesia where the recruitment of health personnel is decentralized, local governments with insufficient financial resources for employment, experience shortage of health professionals. According to a policy maker from Indonesia:

*Sometimes, WHO portrays us as having a deficit because the issue is actually the unequal geographic distribution of nurses. Many nurses decline postings in remote areas. Yet, from the perspective of overall nurse availability, we are in surplus (L4S\_ID\_pol\_02)*

Furthermore, in India, an expert indicated that:

*In districts like Trivandrum, the shortage is not as visible, but in northern and rural districts, gaps exist. Nursing shortages are even more apparent (L4S\_IN\_exp\_3).*

Thus, the shortage of health professionals in some parts of Indian and Indonesia is largely induced by the uneven distribution of resources and unrealistic working conditions in rural areas. An interesting phenomenon in Ukraine is the lack of national licensing system or licentiate that track medical professionals making it difficult to evaluate supply in the labour market. A policymaker in Ukraine noted that:

*We do not have a registry of medical professionals. The data collected by the National Health Service are incomplete and do not fully reflect the situation. Likewise, official reporting provides only a partial picture. Labor market demand data are also highly approximate. We cannot assess what the actual structure of the market should be because demand is significantly distorted. This requires structural solutions, such as a registry of medical professionals. And for such a registry, licensing is essential (L4S\_transcript\_UA\_pol\_1).*

To address this geographical imbalance in the distribution of health professionals, Indonesia is offering scholarships to high school graduates from Papua, the 3T regions<sup>1</sup> (*Terdepan, Terluar, dan Tertinggal* or Frontier, Outermost, and Underdeveloped), and children of migrant workers through the *Afirmasi Pendidikan Tinggi (ADik)* programme to further their education and accept postings to deprived areas. Similarly, in the Philippines, scholarships are offered to students as an incentive and/or restrictive measure to retain them, which often requires nurses to accept postings to underserved areas through a Return Service Agreement. A practitioner from the Philippines praised how the return service agreement is contributing to addressing the shortage of nurses, stating that:

*The healthcare profession typically produces graduates that go abroad. But in our school, 95% of our graduates are in the country and returned to their endorsing communities (Tandinco, Palo, 2025).*

A beneficiary of the Return Service Agreement also expressed how proud she was for serving her home country as follows:

*We are really bound to go back to the grassroots, to the communities kung saan tayo nanggaling (where we came from), because we are Filipinos (Return Service Beneficiary, Palo, 2025).*

However, in some cases, patriotism gives way to rationality. Despite attempts to increase salaries, the conditions of service in the Philippines remain poor. Consequently, some students decide not to accept the scholarship, and even those who do often choose to repay the scholarship and the interest, enabling them to emigrate to other countries.

---

<sup>1</sup> 3T Regions refers to a category of regions in Indonesia that are geographically remote from the national center, characterized by limited access to basic infrastructure, and frequently facing substantial challenges in economic, social, and educational development. This term encompasses the most peripheral areas of the country, including the outermost islands, remote mountainous and inland regions, as well as areas marked by high levels of poverty and underdevelopment.

In most of the countries of origin, the supply of health professionals exceeds national demand. However, emigration of health professionals contributes to the shortage of skilled personnel in these countries. Even in Ghana, with a backlog of certified nurses, the country is losing experienced health professionals who are not readily replaceable. One nursing practitioner in Ghana described the loss of experienced health professionals as follows:

*We are losing, not numbers but skills and experience. If numbers, we are fine. They should go. However, the calibre of nurses that are leaving are the highly skilled and experienced. Many of our critical care nurses are leaving. Emergency nurses are leaving...The skilled and experienced ones are leaving the enrolled nurses to hold positions that they should not have (L4S\_Gh\_prac\_07).*

In the same vein, there are fears of a shortage of nurses in Nigeria, given the current rate of emigration of these professionals, as narrated by an expert, stating that:

*“If care is not taken, we are going to have a shortage of health care workers in Nigeria very soon” (KII1/Female/Expert/Migration Company)*

In the Philippines, a low passing rate for board takers and the outmigration of healthcare workers<sup>2</sup> contribute to a shortage of about 127,000 nurses<sup>3</sup>, which is projected to increase to 250,000 by 2030<sup>4</sup>. In Ukraine, aside from voluntary emigration, the war has caused forced migration and led to military mobilisation, which further depletes the stock of health professionals in the country. In addressing this challenge, the World Health Organisation is supporting Ukraine in conducting surveys, audits, and modelling to estimate the numbers of active, displaced, or emigrated nurses and doctors, providing decision-makers with scenario-based estimates.

## STEM

In most countries of origin, there appears to be a lack of effort in systematically recording the number of STEM professionals trained and employed to determine the level of mismatch, or misinformed programme choices and their related challenges. The case of Indonesia, however, provides a glimpse of how a skill mismatch could be contributing to unemployment in the STEM sector. According to a policymaker:

*[training provided by Work Training Institutions] achieve only up to a 30% placement rate in the domestic labour market. However, when training is directed toward overseas positions, the placement success rate reaches 99% (L4S\_ID\_pol\_01).*

This indicates that training professionals for export is more targeted than the general STEM programmes in the country.

<sup>2</sup> Philippine Statistics Authority.

<sup>3</sup> Alibudbud, R. (2023) “Addressing the Burnout and Shortage of Nurses in the Philippines,” Sage Open Nursing. doi: 10.1177/23779608231195737. PMID: 37584034; PMCID: PMC10424539.

<sup>4</sup><https://www.hospitalmanagementasia.com/talent-skills/fighting-philippines-growing-nursing-shortage-capitol-medical-centre-shares-retention-approach>.

As most countries have transitioned from an agricultural to a service-dominated sector (Asis, Ducanes & Soco-Roda, 2025), the demand for STEM professionals is increasing. In the Philippines, for example, STEM professionals are not only trained for export, but there is also a rising local demand for these professionals. In Ghana and Nigeria, there is a huge interest in STEM education. According to a practitioner:

*There is a lot of interest in the area, but I do not think there will be a surplus of ICT experts in Ghana because the skills in there are always requested for. The ICT skills are always in constant demand. So, we could have a deficit of ICT experts rather than a surplus. I think that we just need to encourage more people to do ICT to take a lot of people from the street. Now, most of the youth have apps on their phones that they use to do a lot of things. Some of them are trading, doing supplies on their phones and laptops (L4S\_Gh\_prac\_06).*

In Ukraine, there is a lower interest in STEM fields. Even though the country is experiencing a shortage of IT specialists, driven by mass migration due to the war, approximately 20% of Ukrainian IT professionals currently work abroad. STEM specialties are often perceived as not prestigious and too difficult in Ukraine. Consequently, state-funding incentives do little to attract people to STEM education as narrated by a policy maker:

*In STEM, there are a huge number of state-funded study places. Very often, we face the problem that these specialties are simply not popular enough. As a result, state-funded slots go unfilled (L4S\_UA\_pol\_2).*

Meanwhile, many experts and practitioners envisage that STEM education, if taken seriously, can address the high unemployment rates in the countries of origin. For example, a Ghana practitioner states that:

*You know how the economy is now. Also, when you go into the ICT system, you do not even need to depend on government for employment. The ICT ecosystem presents so many opportunities that you do not need government to employ you. How many ICT experts can the government employ? In most of the developed world, it is the private sector that is driving the economy. Now, the idea of being employable means that you can create a job for yourself or be employed. The focus now is looking at the self-employed aspect where people get skills that will not require government or other persons to employ them. If you talk to the youth this time, most of them do not want the 9 to 5 jobs. Most of them would tell you that they want to work from home, or they want to do their own jobs because the 9 to 5 job does not pay much (L4S\_Gh\_prac\_06).*

This practitioner recognised the difficulty the government faces in employing graduates into non-existent roles in the public sector. So, there is a need for a paradigm shift towards programmes that will empower individuals to create their own jobs, and STEM could provide that opportunity.

## CONSTRUCTION

Like the STEM sector, the demand and supply of construction workers are not as clear as those in the health sector due to limited or outdated data. Reports from all seven countries indicate

that construction is characterised by informality. Workers in the construction industry are often referred to as artisans, having received little to no formal training. The countries in this report are improving the skills of construction workers and offering advanced training and certifications to trainees. Vocational institutions are encouraged to offer short training modules and flexible programmes to meet employers' demands and formalise the artisans. In Ghana, for example, the GIZ has supported the Ghana Institute of Engineering to provide advanced training for construction workers. An expert from Ghana recounted that:

*For the craftsmen, too, for the past 5 years, we had training for them. I have conducted some training for them in the areas of concrete and iron rods. These are materials used in the construction industry. We had training in the Ashanti, Northern, Upper East, Greater Accra, and the Western Regions. The main purpose was to formalise their front and also trying to imbue the sense of professionalism in them (L4S\_Gh\_prac\_08).*

Construction workers from many of the countries of origin, particularly Nigeria and India, migrate to the Gulf countries to work. Additionally, like other sectors in Ukraine, the construction industry faces an acute shortage of workers, with over 70% of companies reporting insufficient staff due to the war's impact on the workforce and a general emigration of workers. In the Philippines, the sector faces short-term employment challenges because of project-based work, as more than two million workers are needed to meet the labour requirements of the construction industry by 2025.<sup>5</sup>

In the Philippines and Ukraine, construction seems unattractive. Despite unprecedented demand for construction workers, especially in Ukraine for reconstruction needs, the construction industry is perceived as physically demanding and poorly remunerated. Similarly, there is a shortage of qualified labour in the construction industry, which jeopardises the overall construction quality in Indonesia. In an interview with the Department of Labor and Employment (DOLE) representatives in the Philippines, they narrated:

*In the Philippines, efforts are being made to make construction attractive by enhancing benefits and working conditions (DOLE representatives. 22 May 2025).*

In addition to training, Ukraine is seeking to attract workers from South Asia for reconstruction efforts due to Russian invasion that has destroyed infrastructure.

#### **1.4 Migration of STEM, Health and Construction Personnel (from origin country)**

This section presents the drivers of migration of health, STEM and construction professionals in Link4Skills' origin countries. It also outlines the policies and initiatives that these countries are developing to prevent brain drain, as well as existing bilateral agreements that govern labour migration in these countries. The reports indicate that the motivations for migration across all the sectors are similar. Therefore, in this chapter, we synthesise the reports for all the sectors concurrently.

In all seven countries of origin, poor working conditions are a major driver of emigration among health professionals. According to a Nigerian policymaker:

---

<sup>5</sup><https://www.jcvassociates.ph/blogs/hard-hats-harder-challenges-the-hurdles-faced-by-construction-consultancy-firms-in-the-philippines>

*What is making people migrate... is low wages, poor employment conditions. Most of them are moving because they are attracted to the living wage being paid overseas (L4S\_Ng\_Pol\_11)*

*A recruiter provided a vivid comparison between nursing remuneration in Nigeria and the United States of America as follows:*

*You can't compare a nurse who is BSc nursing working in the US, collecting a salary of \$12,000 per month, with working in Nigeria and collecting 40,000, 50,000, 60,000<sup>6</sup> (L4S\_Ng\_Expt\_02).*

Besides the relatively low wages for these professionals in their countries of origin, an unconducive working environment also pushes them to migrate to other countries. A Ghanaian expert revealed the following:

*Most facilities operate with the minimum. Others do not even have basic equipment. The health facilities that they are putting up recently come with equipment. They handed over about 5 district hospitals recently and they are well-installed with equipment. So, everything you need is available. However, the old ones, there are virtually no equipment in them. You put staff there, and they will struggle, which is one of the demotivating factors. You have trained a critical care nurse and emergency nurse, and you send them to a district hospital, but the equipment is not there. They can only improvise and do their work. Go and visit some of the old district hospitals, you will see what staff go through over there (L4S\_Gh\_prac\_07).*

Despite the relatively lower salaries and poor working environments, the working hours are equally long in these countries, contributing to the migration of professionals. Trainee nurses, in particular, often plan to take the required language courses and professional exams for their preferred destination countries for nurses immediately after their training to enable them to migrate. In addition to these factors, insecurity in Ukraine is a major factor causing the emigration of professionals, as revealed in the following:

*People are not leaving because they are looking for a better life abroad, but because their homes have been destroyed (L4S\_UA\_pol\_2).*

The emigration of these professionals from their countries of origin is expected to increase, given the lack of or inadequate policy measures to improve working conditions, rising unemployment, and the demand for these professionals in most developed countries in Asia, Australia, the Americas, and Europe. It is therefore important to examine the policies in the seven countries of origin that seek to prevent brain drain.

Our study shows that most of the seven countries do not have adequate policies to retain health, STEM and construction professionals. Since unemployment is a major problem, some countries like Ghana are even encouraging professionals to emigrate. Similarly, the absorption rate in Indonesia is only 20%. In Nigeria, the absorption rate is very low, leading

---

<sup>6</sup> The current US Dollar-Nira rate is 1:1,462.70 (as at 06-07-2025)

to increasing emigration, also known as the *Jakpa syndrome*. In Indonesia and the Philippines, efforts are being made through scholarships to retain skilled labour within the countries. In Indonesia, scholarship beneficiaries are required to return to the country within 3 months after graduation to provide their expertise to their home country. Similarly, in the Philippines, scholarships for health education are awarded to individuals from disadvantaged regions in an effort to retain them; however, as we mentioned earlier, poor working conditions are rendering the policy ineffective. Additionally, the government is encouraging skilled Filipinos abroad through the *Balik Scientist Programme* to return home and provide their service to their country. In Ukraine, it is estimated that only 10%-15% of professionals are willing to remain in or return to the country.

The National Agency for the Promotion of Employment and Skills (ANAPEC) in Morocco has the mandate to act as a central intermediary, ensuring that mobility schemes respect both Moroccan labour-market needs and international standards for fair recruitment (ANAPEC, 2023). ANAPEC's approach explicitly avoids destabilising sensitive sectors. A consultation mechanism is employed to prevent recruitment in sectors vital for national development, such as public health, aeronautics, where Morocco has made significant investments and certain ICT occupations currently under strain. Despite these efforts, Morocco loses an estimated 600 to 700 medical doctors to emigration (FEML, 2023).

Despite the increasing emigration of professionals, there are no bilateral agreements or limited bilateral agreements governing labour migration in Ghana and Nigeria. For instance, in Ghana, although there is no existing bilateral agreement governing the migration of STEM professionals, an agreement exists between Ghana and Barbados and Jamaica regarding the migration of nurses from the former to the latter. There is also a pilot project to train construction workers in Ghana for safe and sustainable migration to Germany and Italy. In Nigeria, while there are some STEM and Construction projects with Lithuania and Germany, respectively, many practitioners are not aware of these initiatives, as revealed in the following:

*I'm not aware of any other bilateral agreement signed by Nigeria and any other nation. I'm not aware."* (L4S\_Ng\_Prac\_08).

Ironically, Ghana and Nigeria do not have bilateral agreements with Canada, the United Kingdom, and the United States, which are the popular destinations for nurses from these countries. Some experts and practitioners argue that bilateral agreements come with responsibilities, which these destination countries are unwilling to assume. After all, it is a matter of demand and supply, since they always receive health professionals from other countries, there is no need for them to take responsibility for bilateral agreements. This is what a Ghanaian practitioner said:

*They know they can get nurses moving to their countries whether there is an agreement or not. So, if they can recruit qualified nurses moving to their countries on their own, why do they have to come and pay? Mind you it is not only Ghanaian nurses who can migrate to the UK. Other countries which are facing similar challenges could also encourage their people to go. They can even make the migration processes easy for them to go because in a way, they are addressing some of their unemployment*

*issues. It is dangerous to train and to have the trainees unemployed, sitting at home (L4S\_Gh\_prac\_07).*

The other countries in this report have bilateral labour agreements with European Union countries. Morocco signed the Mobility Partnership with the European Union, a package that includes facilitating professional mobility, cooperation on training, and joint border management. Morocco has established frameworks of bilateral agreements and memoranda of understanding that govern the migration of workers in the health, STEM, and construction sectors with Germany, Italy, Belgium, Gulf countries, and Canada (Ministry of Employment, MIPEEC, 2023). The Morocco-Germany corridor exemplifies the new paradigm of the EU Talent Partnership, which addresses unregulated recruitment and fosters mutual benefits. The Philippines has recently signed two bilateral labour agreements with Germany to facilitate the deployment of Overseas Filipino Workers (OFW) in the healthcare sector and other professional areas. India also has a bilateral agreement with Germany, the Comprehensive Migration and Mobility Partnership Agreement, which facilitates the easier mobility of skilled professionals. In the seven countries of origin, Indonesia dominates in terms of bilateral agreements for labour mobility, as it has ongoing agreements with Japan, Germany, Austria, South Korea, Australia, Canada, and Switzerland. The countries with bilateral agreements lamented of difficulty in attaining 'triple win' due to limited recognition of qualifications, insufficient benefits and institutional asymmetry due to unequal bargaining power.

## 1.5 Conclusion

This research aimed to empirically investigate the quality of training and education in STEM, health, and construction in Ghana, Nigeria, Ukraine, the Philippines, Indonesia, and India. We further examined how labour market demands in STEM, health and construction align with the supply of graduates from educational institutions. This study also explored shortages or surpluses of labour in these disciplines and how migration contributes to the creation of brain drain, brain circulation or triple win.

The study found that STEM, health and construction have been placed under specific government agencies to ensure quality education. The findings revealed that training quality in health, specifically in nursing, was the highest among the three disciplines studied, owing to the structured curriculum that integrates theory with practice across all seven countries examined. Although STEM and construction programmes, as well as engineering and ICT at the university level, tend to be more theoretically oriented than practical, nursing at the university level emphasises both theory and practice. The shortage of practical training in STEM and construction programmes at the university is not due to the poor quality of the curriculum, but rather the non-availability or outdated equipment and laboratories for experiments. Surprisingly, similar STEM and construction programmes at the vocational and diploma levels combine practical training with theory equally. In a nutshell, skill mismatch is predominant among tertiary graduates.

A significant weakness that reduces the pace at which the curriculum in the studied disciplines meets the local and foreign market demands is the duration of curriculum review. This research found that, among all the countries studied, there is a 4-year average interval between curriculum reviews. In a fast-growing global economy, it is regressive to hold onto a

curriculum without opportunities for review, given that technological advancements necessitate urgent change.

Asis et al. (2024) maintained that, although the seven origin countries they studied, which are captured in this report, maintained a surplus of nurses, the World Bank reported shortages based on the nurses-to-patients ratio. This study reiterates the findings in this qualitative study revealing the complexity of the situation. Interestingly, the data revealed that in Ghana, Nigeria, Morocco and India, a surplus in nursing occurs due to a lack of financial clearance on the part of the government, who is the main employer of nurses. In the Philippines, Ukraine and Indonesia, the surplus occurs because nurses refuse to accept appointments in rural localities. These scenarios create artificial surpluses, which serve as motivation for these skilled personnel to emigrate. Once the surplus labour emigrates, the discourse shifts to brain drain and the use of scarce national resources to train skills that abandon nation-building. The irony from the data remains that some of the countries studied do not have any bilateral agreement regarding the migration of skilled personnel, and even those who have are not able to achieve a triple win or brain circulation.

## Part II: COUNTRY REPORTS

### 2.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION IN ORIGIN – GHANA

Authors: Mary Boatemaa Setrana, Justice Richard Kwabena Owusu Kyei, John Narh and Joseph Teye, Centre for Migration Studies, University of Ghana

#### 2.1 Training and Education in STEM, Health and Construction

##### 2.1.1 Curricula Relevance and Graduate Quality

Ghana's education system and curriculum have undergone a significant transformation in recent years, intending to equip students with the knowledge and skills essential for the global economy (Avusu, 2024). Rapid technological growth and a fluid labour market economy make it difficult for the curriculum to keep pace with time. There are various institutions responsible for approving curricula at different levels of education. The Ghana Tertiary Education Commission (GTEC) has the authority to regulate tertiary education in all its forms, ensuring efficient and effective administration and accreditation. An official at GTEC had this to say:

*Well, this place has gone into metamorphosis. Initially, we used to be called the National Accreditation Board (NAB), and a measure came with the introduction of a new Act called the Education Regulatory Act 1023 (2020), which combined the National Council for Tertiary Education (NCTE) and NAB to become the Ghana Tertiary Education Commission (GTEC) (L4S\_Gh\_prac\_09).*

The Commission for Technical and Vocational Education and Training (CTVET) was established by the Education Regulatory Bodies Act 2020 (Act 1023) to regulate, promote, and administer technical and vocational education and training for transformation and innovation, thereby promoting sustainable development. CTVET has the mandate to formulate national policies for skills development across the broad spectrum of pre-tertiary and tertiary education, formal, informal and alternative education (CTVET, 2025). An employee of CTVET recounted that:

*Yes, it is not only ICT but for all technical and vocational education and training (TVET) programmes. CTVET approves the curriculum and all that, and manages the institutions. The service has to ensure that all the requirements are met by accredited institutions. CTVET goes around and does monitoring as well as enforcement. We make sure that, as per what they came for accreditation, that is exactly what they are doing. So, that is the arrangement (L4S\_Gh\_prac\_06).*

The Nursing and Midwifery Council (NMC) is a statutory body with a mandate to ensure the highest standards of training and practice in nursing and midwifery in Ghana, in the public interest (Nursing and Midwifery Council, 2025). NMC operates under the Health Professions Regulatory Bodies Act, 2013 (Act 857).

NMC states on its website (Nursing and Midwifery Council, 2025) that it has the mandate to ensure “the availability of qualified nursing and midwifery professionals who would give competent, safe, prompt and efficient service for client delight”. It has a vision to optimise the use of ICT solutions aligned with the 4<sup>th</sup> Industrial Revolution for improved nursing and midwifery regulation.

The Ghana Health Service (GHS) was established under Act 525 of 1996, as mandated by Ghana's 1992 Constitution. GHS aims to provide and manage holistic and accessible healthcare prudently, with special attention to primary healthcare at the regional, district, and sub-district levels, in line with approved national policies (Ministry of Health, 2025). An employee interviewed narrated that:

*The service is the main implementing agency of the Ministry of Health. So, per our enabling act, that is the GHS Act in 1996, ACT 525, we have the mandate to approve national policies at the community, district and the regional levels. We implement policies, we provide and manage accessible health services (L4S\_Gh\_prac\_10).*

There are various institutional bodies vested with legal and operational authority to ensure that education at different levels meets market demands and aligns with Ghana's developmental agenda. Hence, the research probed further to inquire how institutional bodies operationalise their activities, especially in the area of educational quality. The regulatory bodies argued that adequate and up-to-date curricula are obtained through engagement with different stakeholders in the process of evaluating and approving programmes. An interviewee from NMC stressed that:

*During the development of the curriculum, all the stakeholders of health matter such as the Ministry of Health, Ghana Health Services, the World Health Organisation, the Food and Drugs Authority, the students, teachers, I cannot mention all, are all involved. We send invitation letters to all the stakeholder for the review to ensure that their needs are considered in the curriculum. Some of the stakeholders have needs that they want our nurses to know during their training so that they can provide professional care to the patient or client. We also ensure that the development is competence-based (L4S\_Gh\_prac\_10).*

An official from CTNET also recounted that:

*With the curriculum we develop, we start with doing a market survey to understand what the market is demanding. We also work with the sector experts, whom we call sector skill bodies. So, we have the sector skill bodies for ICT, who lead in identifying the emerging needs and what is required by industry to ensure that if people have skills in these areas, and they get to the world of work, they will not require any further training. They can just go straight in and with some orientation, they can just start working. So, industry experts help in identifying the emerging needs (L4S\_Gh\_prac\_06).*

From the data, it is understood that meticulous measures are considered before curricula especially in nursing and TVET programmes are drawn. A holistic approach is adopted in ensuring that the voices of all stakeholders are heard and concerns addressed so that the skills produced will be ready for the labour market.

### **2.1.2 Strengths and Weaknesses of Curricula in Meeting Market Demands**

In this section, we examine the strengths and weaknesses of the curricula in health, construction, and STEM (ICT) in meeting market demands and the country's developmental agenda. In providing a general evaluation of the sectors under consideration, an official from GTEC noted that:

*In fact, the quality as it is now on a scale of 1 to 5, with 5 being the highest, when it comes to construction, I will rate it 3/5, the health will be 4/5. With the STEM, because we have just started it and the fact that it does not have a proper structure, because the Junior High School pupils are supposed to start with it, but it is not happening, that makes it difficult to assess (L4S\_Gh\_prac\_09).*

A CTNET official held that the ICT curriculum and mode of teaching conform to the needs of industry by recounting that:

*We issue a certificate which industry acknowledge it being fit. These are the reason why we are sure the curriculum is relevant to the needs of industry. if somebody need to service his laptop or something, even if that is the only unit you have learnt, then of course, you are useful in that regard and you can make money out of that. So, we make sure that these standards translate into the units to train the people. So, we have the learning materials developed by the industry and do competence-based training (L4S\_Gh\_prac\_06).*

An official from GTEC narrated the standardised nature of the training in nursing and midwifery, which is in line with industry demands, not only locally but also at the international level.

*The public ones are many and are structured in such a way that they meet the international standards and the reason some of our nurses are posted outside (the country). Because the nurses' curriculum is nationally inclined, the changes are done based on current trends. If we take the nurses and midwifery council, the professionals or the diploma, that one is standard, and it meets international best practices and it's the reason some of our nurses are poached outside. Even those who come from mostly other West Africa countries like Nigeria tend to perform better in terms of health, nursing, and midwifery side when they complete successfully and go back to their country (L4S\_Gh\_prac\_09).*

A GHS official added to the discussion by narrating that:

*Due to the appreciable period at the medical practice, before they pass out, they are already conversant with their operations and what they are supposed to do. So, we do not spend so much time trying to orient and bring them home.*

*So, the blend between the theory and practical aspect is perfect such that they have the knowledge, and they have the skills. So, wherever they are placed, they perform. That is why when they migrate, they excel at their destination. It is a plus that we have calibre of middle-level officers who have the skills to attend to the health needs of the people (L4S\_Gh\_prac\_07).*

An official from NMC explained how nursing and midwifery schools and training operate to fulfil the needs of the industry:

*Looking at the processes in the training of nurses and midwives, NMC oversees accreditation so before you start as school, there is a process you have to go through to meet the requirements. After establishing the school, the NMC does frequent visit and supervision and monitoring to ensure that the schools follow the standards. The clinical practice also ensures that the graduates are well prepared and experienced. So, for me, if you go through the laid down processes judiciously, you should come out with high quality standard. Let me add that after the school examination, there is licensing examination that the students must write, which ensures that every trainee has at least the basic competency to care for a patient or a client wherever you find yourself. So, all these processes are to ensure that the trainees come out well. Then trainees are required to do one-year rotation under supervision. So, the processes ensure we get high quality nurses and midwives (L4S\_Gh\_prac\_10).*

Despite the above-mentioned strengths, some fundamental weaknesses were identified in the sectors which need attention. Among the problems raised was the intervals for the review of curricula of programmes which were relatively long considering the fluidity of market demands and technological advancement. An official from CTNET indicated that:

*The norm is that curricula are reviewed 3 to 5-year periods, I think that with ICT the review sessions must be much faster. That would also mean that there would be a need for consistent resources. If every 3 to 6 months, new things are coming up, then we need to keep up with that pace. There is a need for constant review and updates in the new technologies that are coming up (L4S\_Gh\_prac\_06).*

According to the NMC official, due to rapid changes in health situations such as epidemics, the curricula may not be readily adapted to meet the pressing needs. This NMC official gave examples of some of the fundamental weaknesses found in nursing education.

*I do not know whether they are weaknesses or not. We have something called knowledge-practice gap dichotomy where you are taught something in the classroom and you go to the field, and you see that it is different.*

*Sometimes, we see some students who go to the ward and do something different from what they were taught in school. Sometimes too, unfortunately because of the long duration for the curriculum review, things get elapsed and we cannot capture some pressing issues, which can create confusion (L4S\_Gh\_prac\_10).*

Another problem identified is the implementation of programmes that may or may not meet national or international standards due to their duration or the awarding agency. A GTEC official mentioned how in construction training, some diplomas are locally issued by the institutions running them, while others, such as Higher National Diploma (HND), are CTVET certified. This GTEC official said:

*Regarding the construction side, the technical universities run HND programmes that are standardised by CTVET. The HND issued certificates are CTVET certified as such the curriculum meet international best practices. Whereas the individual institutions run local diplomas that are not from CTVET and makes conversion difficult as well as its international recognition (L4S\_Gh\_prac\_09).*

Some academic institutions run certificate programmes to upgrade the skills of artisans, and sometimes in collaboration with employers. The value of such certificates is limited as they do not have national or international recognition, despite the standard acquired skills of the participants, such as a diploma in construction training. In Ghana, the training of certificate nurses and midwives has the approval of NMC, but the duration and curriculum do not meet standard nursing practice, as well as international standards. An official at NMC noted that:

*One additional sad thing is that every year, about 50% to 60% of the people that come out of nursing training schools are not qualified to work as certified nurses. You enrol and train nurses for two years, certificate nurses, aside from Ghana, they cannot work*

*elsewhere. So, that is one of our biggest challenges. We started talking about it for a long time ago that they should stop training such nurses, but the politicians said no because majority of their constituents cannot obtain the grades that would enable them to do the degrees and diplomas. So, taking it out is disadvantage to them so they approve their training. The last time we employed nurses, they constituted about 40% of them but we do not need them. So, it is a challenge (L4S\_Gh\_prac\_10).*

The narrative highlights complex institutional nursing issues confronting the healthcare sector in Ghana. First, the health services are clinically inclined, but with limited investment in areas such as old age homes, childcare centres, and centres for the physically and mentally challenged, where the services of these certificate nurses are best suited. Moreover, the political dimension further complicates the situation, as the 4-year cycle of presidential and parliamentary elections compels policymakers to make decisions that are inherently subjective in nature.

### **2.1.3 Standardisation of Informal Training and the Challenges Encountered**

In Ghana, nursing and midwifery training are widely formal, notwithstanding informal practitioners who are referred to as 'traditional midwives and healers'. In the early 2000s, Ghana officially banned the engagement of the services of Traditional Birth Attendants (TBAs), but this policy has not been able to completely wipe out TBAs, especially among rural residents.

In the aspect of construction, there are efforts to standardise the training of craftsmen and enrol them into the body of engineers as engineering practitioners. An official of the Ghana Institute of Engineers (GHIE) narrated that:

*Now, we should all understand that there is a law governing engineering practice in Ghana. Carpenters are part of the law. So, if you are not licensed, you cannot project yourself as an engineering practitioner. You need to be licensed and be in good standing. It means that if you want to employ a carpenter, when the person comes, you can ask him, where is your license or where is your ID card that shows that you are a licensed practitioner (L4S\_Gh\_prac\_08)?*

The official of GHIE further explained how GHIE has embarked on training programmes for the craftsmen to standardise their operations:

*For the craftsmen too, for the past 5 years, we had training for them. I have conducted some training for them in the areas of concrete and iron rods. These are materials used in the construction industry. We had training in the Ashanti, Northern, Upper East, Greater Accra, and the Western Regions. The main purpose was to formalise their front and also trying to imbue the sense of professionalism in them (L4S\_Gh\_prac\_08).*

The Partnership, Workplace Experience Learning (WEL) & Inclusion Directorate is under Ghana TVET Services with multifunctional tasks of upgrading informally trained craftsmen and women (Ghana TVET Service, 2025). The Directorate also has the task of liaising with industry partners to provide work-study environment for TVET students.

## 2.2 Labour Market Demand and Supply

### 2.2.1 The Skill Mismatch and Misinformed Selection of Programmes Studies

Although Ghana's Gross Domestic Product (GDP) grew rapidly from 2.9% in 2023 to 5.7% in 2024 (The World Bank, 2025; Ghana Statistical Service, 2024) beyond expectation, labour productivity fell to 0.45% (CEIC Data). Youth between the ages of 15 and 24 continued to experience high rate of unemployment of about 32% (Ghana Statistical Service Labour report). About 77.4% of the unemployed in Ghana are situated within the ages of 15 and 35 years (Ghana Statistical Service Labour Bulletins for 2023).

The phenomenon raises concerns about the output of educational institutions and the skills needed by the industrial sector that is creating skills gap. The skills gap and skills mismatch have long term effect on the competitiveness and productivity of Ghana which extends beyond unemployment as it adversely affects her developmental agenda. An official of GTEC noted that:

*The question is how effective we are in integrating technology into our various schools. Because our system is such that we do not make good use of most of our research findings. Our problem here is that when things change, we continue to use the old method. Have you ever asked yourself why there are oil here, but a lot of the experts are from outside. Meanwhile, we keep on going to school to study oil and gas, yet we're not in the forefront. So, I think from the start the education given to us by the White people was only to make us continue to depend on them and instead of us to sit down and restructure it to suit us, we have not done that (L4S\_Gh\_prac\_09).*

There is growing weariness among experts and policymakers about the mismatch between students' skill acquisition and employers' skill demands in Ghana as studies indicate crucial skills gap in areas such as digital literacy, communication and data analysis. Employers are compelled to invest resources in providing extra training to bridge the skills gap. The GTEC official further recounted that:

*The nature of our training is not linked to practical performance. Thus, the training given to the graduates are mostly theory that cannot make them perform practically when they graduate from school. The main reason for the unemployment is that our schooling system is mostly theoretical. It is not geared towards practical-oriented activities. Let us say that I want to take typing as my profession and I have been*

*enrolled in a secretarial school. But all that they teach are the theories, when I come out, I will be used to doing only the paperwork (L4S\_Gh\_prac\_09).*

From the findings, it was identified that there is a mismatch between the school curriculum and resource availability in meeting the practical training aspect of the programmes mounted.

## **2.2.2 The Current Issue of Demand and Supply Strategies in Nursing, Construction and STEM**

In the instance of Ghana, the number of students enrolled in healthcare programmes are outweighing the basic resources such as classroom capacity, laboratory apparatuses and basic amenities which do not facilitate efficient academic formation.

*There is a portion of the curriculum that indicate that students are to use a certain number of hours to do practical, visiting the hospitals, or visiting facilities that are supposed to provide practical training. But here is the case that the people are so many in such a way that the person going to teach those students find it difficult to support every student. Hence, it becomes a problem. The facilities for them to do the practical training is also not available all the time. So, if the nation is training 500 nurses across the country and they are supposed to go to the hospitals, ask yourself if the teachers who are surrounded by many students can be able to tell if some of them failed to take the blood (samples) well. So, it becomes so disincentive (L4S\_Gh\_prac\_10).*

An official of GTEC reiterated that enrolment in various aspects of health, construction and STEM is on the increase in the universities and higher technical and vocational institutions but their impact in the future are difficult to assess due to the theoretical approach to training.

*As for the enrolment, statistics that we take from the universities shows that we have a lot of them at the health sector, engineering, science and technology, we've a lot of students there. The level of enrolment is encouraging but as to whether their development is going to impact on our country is anything to write about maybe we can do better in some few areas. I do not know how to measure the level of impact in the future (L4S\_Gh\_prac\_09).*

In addressing the demand and supply nexus in STEM with emphasis on ICT, an official of CTVET mentioned that:

*There is a lot of interest in the area, but I do not think there will be a surplus of ICT experts in Ghana because the skills in there are always requested for. The ICT skills are always in constant demand. So, we could have a deficit of ICT experts rather than a surplus. I think that we just need to encourage more people to do ICT to take a lot of people from the street (L4S\_Gh\_prac\_06).*

Commenting on the mismatch in the demand and supply of nurses as shown in Deliverable 3.1, an official of NMC lamented that:

*With that one, I do not think we have done a proper analysis as to needs of this country. Within the nursing sector, we have different branches like how many are anaesthetics, or public health nurses but we just put them all together as nurses. We should know nursing is a huge sector, so we should think of which area we should train more within maybe the next 10 years. Should we train more midwives, anaesthetics, gynaecologist, paediatrics and not general nurses since we have a lot of them (L4S\_Gh\_prac\_09).*

The GHS official also commented that:

*It is dangerous to train and to have the trainees unemployed, sitting at home. so, officially, the last batch of nurses that were employed were 2021-year group. So, it means that as at this year, we have 2022, 2023, 2024 batches yet to be placed. So, if every year we are churning out 25,000, it means we have 75,000 qualified nurses unemployed (L4S\_Gh\_prac\_07).*

The excess supply over demand is directly linked to the youthful nature of the working population that makes transition into pension slow and as a result generate excess and unemployed labour.

The GHS official narrated that:

*Recently, there was a market labour analysis which gives you a very good basics of the numbers that are trained. They are huge and government cannot employ them. If I take you through the number of people we have employed in the service, it is huge. We have about 65% or 70% of our staff who are below the age of 40 years. So, if these people do not migrate, for the next 20 years, they are going to be in employment. So, it is not as if people are going to leave the system soon for some space to be created for new ones to be employed. So, we will get to a point where we cannot employ again. You can go through the training schools and see. One class, there are 200 students. So, yes, it is true that there is a backlog but it cannot be blamed on any government. The system has been allowed to do that. So, until we take steps to reverse, it will continue to be like this (L4S\_Gh\_prac\_07).*

In their projection for the next 5 to 10 years in the demand and supply of construction and STEM, an official of CTVET noted that:

*Ideally, technological advancement is the way to go. But if we do not have proper plan in place, the next 10 years will come, and we will still be nowhere. But, if we are saying from now onwards, we need to have students well versed in road construction,*

*automobile, mining and ICT, then we plan towards it so that these skills will be developed to take care of the lapses in the system (L4S\_Gh\_prac\_09).*

### 2.3 Migration of STEM, Health, and Construction Personnel

Deliverable 3.1 demonstrated that STEM workers, construction and health workers are motivated to emigrate due to perceived unfavourable conditions of service and unemployment at home. The GTEC official interviewed corroborated this assertion this assertion that:

*Regarding unemployment, a lot of them have finished school from the basic to the tertiary level and the govt is not expanding the employment avenues to take them on board. So, if one finishes school, it can take about 5 to 10 years before one gets a job. Obviously if there is opportunity for people to travel by air, land, or sea, they want to explore those greener pastures although it is not rosy over there (abroad) (L4S\_Gh\_prac\_09).*

The GTEC official further recounted that the conditions of service are not attractive enough to keep personnel in the country.

*The nature of our work is such that people can work for so many years, but the take-home is very small and after pension too, the money given to you is so small that it cannot even buy your medicines.*

*When we are actively employed, our salary includes allowances that are not part of our basic salary so when we retire it affects our social security. Our salary is small so yes, poor remuneration and pension contribute to the exodus of most of our skilled workers (L4S\_Gh\_prac\_09).*

The official from NMC also reiterated that:

*One is condition of service in terms of remuneration. Even apparatuses they want to work with in the wards are not available. Their services are not appreciated and the conditions in the hinterlands are even worse. There is no accommodation for them in the hinterland. They are lured there with the promise that after three years, they would be replaced but they are neglected after accepting to go to the villages. While they are there, their colleagues in the cities are upgrading themselves or having other opportunities (L4S\_Gh\_prac\_10).*

The personnel from GHIE expressed how together with the German Government provided training for artisans to standardise their know-how and prepare the grounds for possible migration abroad.

*Let me say that the formalisation of craftsmen is also informed by the migration concept. We had collaboration with the German Government which they call business for jobs. We tailored out a project called ProfArt that is, professionalisation of artisans. The whole idea is to ensure that these guys are licensed and well-regulated and see how we can formalise their front, in terms of updating their skills. Maybe, instead of using crowbar to remove nails, they could use a hand-power tool to do that. So, we had this programme with GIZ and we had over a thousand craftsmen licensed on our register. So, with regard to training, we have done some training for them (L4S\_Gh\_prac\_08).*

In terms of retention of health, STEM and construction workers from emigrating, the data showed that it was difficult to retain them especially nurses. The caveat that restricts mass emigration from Ghana is the strict migration policies of the destination countries that control the rate of migration flow. The official from GTEC remarkably noted that:

*As for retaining, it is just on paper, for we cannot retain anyone. The problem is that it is difficult for people to move out, so they will do as if they are in here, but their minds are there (abroad). For example, we recruit young ones here and they soon leave for outside when the opportunity comes. We need incentives for our basic needs like housing, food and shelter and those ones too are difficult to attain them and only few people can afford to get three square meals a day (L4S\_Gh\_prac\_09).*

It was further identified that when there is emigration of skilled personnel, the rate of brain drain is huge because the targeted personnel are the experienced and specialised labour especially in the instance of nurses.

It is rampant even in the situation of bilateral agreements for the qualification description requested by the recruiting countries are high for example in the case of Barbados.

*We are losing, not numbers but skills and experience. If numbers, we are fine. They should go. However, the calibre of nurses that are leaving are the highly skilled and experienced. Many of our critical care nurses are leaving. Emergency nurses are leaving. Look at the agreement between Ghana and Barbados? They come with specifications. They do not take general staff. They want highly skilled and critical care nurses and others that have gone through advanced training and have working experience. So, in that respect, I will say that we are losing. If it just about the sheer numbers, as and when they leave, we can easily fill. To get one critical care nurse, I will*

*need a general nurse who would go through training for additional 2 years training. So, if a critical care nurse leaves today and I want to bring a new entrant, that person will not be able perform the functions that the critical care nurse was performing. If you want to train, you will need resources to expand the facilities. The skilled and experienced ones are leaving the enrolled nurses to hold positions that they should not have (L4S\_Gh\_prac\_07).*

As migration of skilled labour in STEM, health and construction is inevitable, there are calls for regulated migration through bilateral agreements to ensure mutual benefit between origin and destination countries. The official from GHS recounted that:

*Of course! Some of us started talking about managed migration a long time ago because we know the numbers that we have and the conditions under which they are employed. We felt that government entered into either bilateral or multilateral agreements with external bodies or countries. So that, it would not be up to the individual nurses or midwives to struggle to migrate. Through these arrangements, nurses and midwives are taken out of the country and in return, some benefits also are generated so we can use same to expand training and improve conditions of training in our various schools. This is something I have always wished for (L4S\_Gh\_prac\_07).*

From the data, it was noted that there are traces of regulated strategies to re-integrate returned migrants into the Ghana health sector.

*Some of them have been there for years and they want to return but they were not sure about it so, we put a system in place to verify their credentials because some of them go and upgrade themselves. To make it easier for them to return, we are collaborating with an organisation, Dataflow that verifies credentials of all professionals. Dataflow assists our nurses in the diaspora to verify their credentials and submit a report to us and then we reintegrate the professional into the Ghanaian health system. So, it is easy to return and give back to society and we are encouraging them to do that (L4S\_Gh\_prac\_10).*

## 2.4 Conclusion

This research sought to provide empirical data as a follow-up on the Deliverable 3.1 studies on health, STEM, and construction training and labour market demand. From the data, we noted that the curricula on diploma and bachelor nursing meet national and international standards which make transfer of skills within and across national bodies feasible. The two-year certificate nursing program was identified as not meeting the international nursing classification. It was discovered from the study that there are efforts to formalise the skills of artisanal workers in construction.

From this study, we identified complex scenarios of demand and supply of nursing. Inasmuch as the training of nurses are opened to private academic institutions, the employment of graduated rests on the government as the employment of private health facilities remains minimal. This creates a surplus and backlog of nurses who remain unemployed. Emigration seems to provide a solution to address the unemployment situation, but there are strict migration policies that make the process cumbersome. Moreover, it was revealed that the existing bilateral agreement in the recruitment of nurses between Ghana and Barbados does not provide a triple win but brain drain. The required nurses recruited are only the experienced and specialised nurses, who drain the Ghana health system with no clear measures of filling the gap.

We recommend that there is a policy direction that enables prompt and collaborative efforts of the various stakeholders, including educators, policymakers, industry players, and community leaders, in the review of the educational curriculum. The rationale is to identify the pressing skills that are lacking and develop a curriculum that meets the needs of the fluid job market. Moreover, there is the need for policies that create space for constant evaluation and adaptation of the curricula to ensure that they remain relevant in preparing students with the requisite skills for the labour market. Finally, we recommend bilateral agreements that have clear triple win strategies especially in empowering the training of specialised nurses.

## REFERENCES

- Avusu, R. (2024). Rethinking the Curriculum: Is Ghana's Education System Preparing Students for the 21st Century?  
<https://rightforeducation.org/2024/12/20/rethinking-the-ghana-curriculum-for-the-21st-century/>
- Commission for Technical and Vocational Education and Training (2025), Who we are.  
<https://ctvet.gov.gh/who-we-are/>
- Nursing and Midwifery Council (2025). Who we are.  
<https://www.nmc.gov.gh/web/whoweare-mobile> (extracted on 19-10-2025).
- Ghana Tertiary Education Commission (2025). General Overview <https://gtec.edu.gh/> (extracted on 20-10-2025).
- Ghana TVET Service (2025). Partnerships, WEL and inclusion.  
<https://gtvets.gov.gh/divisions/partnerships-wel-and-inclusion/>
- Ministry of Health (2025). Ghana Health Service. <https://www.moh.gov.gh/ghana-health-service/>

### 3.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – INDIA

Authors: S Irudaya Rajan, Rohit I, Varsha Joshi (The International Institute of Migration and Development, IIMAD)

#### 3.1 Training and Education in STEM, Health, and Construction

Training and education programmes must align with the demands of the local labour market to promote economic development and workforce competitiveness. This is particularly crucial in the STEM, healthcare, and construction/vocational industries, where new skill requirements are continuously created by market and technological advancement. This section examines the current state of training and education provision across these sectors in India and specifically in Kerala, analysing the effectiveness of curricula, graduate preparedness, and the practical orientation of existing programs. Through stakeholder interviews, we aim to determine whether the programme content meets industry demands and identify the strengths and weaknesses of existing training methods.

##### 3.1.1 Health: Medical and Nursing Education

India's health education ecosystem is designed around progressive immersion into real clinical work. Respondents emphasized that the curriculum is intentionally practical from the first year onward for nursing students and becomes increasingly hands-on for medical students in the second year. This early and frequent patient contact shapes clinical judgement, bedside skills, and the tacit knowledge needed to navigate busy wards. The India Country Profile (Refer India Country Profile document) explains how this experiential orientation has been a long-standing strength of Indian medical education, despite significant variations in institutional resources.

A faculty member summarized the narrative:

*Clinical postings occupy the majority of the daily schedule, usually from morning to afternoon, and students spend much of their time in the wards and clinics... Clinical exposure is where real acumen is built: students learn how to deal with cases, conduct physical examinations, and interpret symptoms.” (L4S\_IN\_exp\_3)*

This underlines that competence is not only a function of classroom mastery but of repeated, structured encounters with diverse patient profiles. Because cases rarely match textbook patterns, students must triangulate symptoms across multiple patients before internalising a reliable analysis. This is a comparative advantage of high-volume public hospitals (Government); they enable frequency and variety of cases that accelerate learning.

The transition from undergraduate study to the workplace is cemented by a mandatory internship year:

*After final exams, all graduates are required to complete a one-year compulsory rotating internship... The internship is extremely hectic, as students rotate through multiple departments. (L4S\_IN\_exp\_3)*

Internships operate as capstone apprenticeships. Rotations integrate procedural know-how (e.g., line insertions, dressings), cross-departmental coordination, and exposure to workflows. Government medical colleges, especially in Kerala's large teaching hospitals, multiply this through sheer patient loads. The effect is a steep learning curve and strong confidence upon graduation. Yet respondents also flagged the cost of learning under pressure. Documentation remains largely manual and time-consuming in many units, and junior staff bear a significant administrative burden. These structural frictions, combined with delays in registration and limited permanent posts, elongate the time-to-practice window for new graduates. The paperwork burden and analogue systems came up repeatedly:

*One weakness of government hospitals is the reliance on manual paperwork... while many private and foreign hospitals now use electronic medical records. (L4S\_IN\_exp\_3)*

---

This mismatch matters for two reasons. First, it marginally reduces clinical time that could be invested in case workups and reflection. Second, it dampens digital fluency with EMR systems, order entry, and audit trails that many destination-country employers consider foundational. Bridging this gap is not merely a matter of introducing software; it requires governance, training, and change management so that documentation complements rather than competes with care.

Financial and administrative signals also shape graduate choices:

*When recent batches began, the house surgeon stipend was around ₹26,000... Postgraduates earn around ₹57,000... at central institutes like AIIMS, PG stipends cross ₹1 lakh. (L4S\_IN\_exp\_3)*

---

Low stipends relative to workload, inflation, and opportunity costs weaken the calculus for remaining in the public system, especially when combined with slow registration and limited permanent vacancies.

### 3.1.2 STEM: Engineering Education

Engineering programmes in civil, mechanical, and allied fields retain a strong laboratory core but face persistent alignment problems with evolving industry needs. Respondents from a government college and a private college converged on two issues: the curriculum revision cycle is long and centralised, and the assessment model has shifted toward objective formats that reward short-term recall over conceptual depth. The Country Profile notes India's rapid growth in STEM outputs; the Human Resource Inventory complements this with indicators on placement rates and the distribution of graduates across sectors and geographies.

On revision cycles and responsiveness, a department head explained:

*Roughly, every four years there is a change or update. But it doesn't always happen on time... another revision is in progress. (L4S\_IN\_pra\_3)*

---

The civil engineering professor further explained how a four-year refresh aligned to cohort cycles is sound, but delays slow the incorporation of Building Information Modelling (BIM), sustainable materials, and modern project management. Colleges cannot unilaterally overhaul syllabus; university-level processes must conclude first. In fast-moving construction markets, this lag compounds graduate-employer misalignment.

On the practical side, both colleges emphasised the limits of labs in reproducing site realities:

*Industry expects graduates to be able to read drawings, supervise works, handle contractors, and solve problems on site... students need six months to a year of additional training before being fully useful. (L4S\_IN\_exp\_2)*

---

Employers do not dispute laboratory rigour; they require judgment under constraints while sequencing trades, coordinating with suppliers, and managing safety. These Competencies are acquired only through extended site exposure.

Assessment style also surfaced as a first-order concern:

*The new system has made theory exams largely objective... Students study only to clear those questions... This reduces depth of knowledge. (L4S\_IN\_pra\_3)*

---

Objective-heavy testing lowers the cognitive demand of problem-solving in structural analysis or hydraulics. Respondents linked this to weaker interview performance because practical reasoning is under practiced in colleges. Post-COVID shifts like shorter attention spans and reliance on slides compound the effect.

### 3.1.3 Construction and Vocational Training

ITIs in each state operate within the national NCVT framework, offering a broad portfolio of trades and a blend of theory, practice, and on-the-job training. This standardisation supports mobility within India and recognition in Gulf markets, but not in European destinations due to the imposition of language and equivalency requirements.

The scale and structure were described as follows by one of the ITIs located in the capital city of Trivandrum in Kerala:

*We have 25 trades... Each class has around 24 students, so altogether we train around 1,180 students every year. (L4S\_IN\_pra\_1)*

---

Volume matters: larger cohorts justify investments in workshops and linkages with employers. But there are difficulties in matching with employability. Daily workshop hours and competency-based testing help, yet respondents noted recurring bottlenecks in soft skills and CBT exam preparedness.

Work-integrated learning is a visible strength:

*On-the-job training is also mandatory, around 150 hours in addition to over 1,200 hours of workshop practice... Apprenticeships are coordinated through the NAC scheme. (L4S\_IN\_pra\_1)*

---

The combination of extensive workshop hours with on-the-job training builds a baseline of practical fluency. Placement drives and job fairs extend the bridge to employment; for Gulf recruitment, the institute screens opportunities before allowing interviews to avoid fake recruiters.

The ITIs also face another major issue. A senior administrator reflected:

*Theory exams being largely objective means students don't build deeper understanding... we need an assessment system that demands genuine learning.*  
(L4S\_IN\_pra\_2)

---

He also pointed to motivation and retention: some students prioritise quick, non-technical jobs over apprenticeships, breaking the continuity that employers prize. Also, 'job-hopping' effect depresses early-career earnings and slows skill accumulation.

A parallel shift is visible in private academies:

*Learners are increasingly opting for newer, service-sector-oriented diplomas that promise faster employability.* (L4S\_IN\_exp\_1)

---

This is seen in the deviation of private vocational courses, from construction diplomas to logistics, aviation, and healthcare administration, signalling a durable preference shift among youth. This is consistent in service-sector pathways.

## 3.2 Labour Market Demand and Supply

Understanding the dynamics of labour market supply and demand is crucial for addressing workforce challenges and ensuring sustainable economic development. The skills that educational institutions create and the skills that businesses need continue to diverge in many nations, even in the face of large investments in education and training. The STEM, health, and construction industries are especially affected by this issue, since complex factors lead to both skill shortages and unemployment in these fields. This section examines the scenario where most graduates do not always result in reduced skill gaps or better employment outcomes. We analyse the interview responses to understand how skill mismatches, lack of professional guidance, and lack of better work prospects lead to unemployment among degree holders in these industries. This provides insights into the policy interventions required to improve workforce planning and utilization.

### 3.2.1 Health

Interviews depict a labour market where the number of graduates coexists with pockets of scarcity. Distributional imbalances are sharp. Hospitals in Urban areas are staffed, while northern and rural districts struggle to fill roles. Migration intensifies these gaps.

The Human Resource Inventory details enrolments, pass-outs, and sanctioned posts; the picture is one of throughput without commensurate absorption, where need is highest.

A clinician described the pattern:

*In districts like Trivandrum, the shortage is not as visible, but in northern and rural districts, gaps exist. Nursing shortages are even more apparent.* (L4S\_IN\_exp\_3)

---

The interpretation is not that the system under-produces nurses, but that incentives, placements, and working conditions do not align with rural realities. Housing, predictable rosters, and career ladders weigh heavily on choices. Without calibrated incentives, staffing remains uneven even as national output rises.

Pay scales further shape retention:

*House surgeon stipend was around ₹26,000... Postgraduates around ₹57,000... central institutes cross ₹1 lakh. (L4S\_IN\_exp\_3)*

---

Relative pay, not just absolute pay, matters. Where a neighbouring system offers materially better stipends, structured hours, and modern facilities, early-career clinicians rationally migrate. The Country Profile links these disparities to sustained outflows to the UK, GCC, and Anglophone destinations.

Administrative friction compounds the calculus:

*Registration and certification processes... are slow and bureaucratic... Without registration, they cannot work legally. (L4S\_IN\_exp\_3)*

---

Time lost in administrative queues is time not earning, training, or specialising. Streamlining licensure and guaranteeing predictable timelines would likely improve domestic retention at the margin.

### 3.2.2 STEM

In civil engineering, demand is cyclical, and company visits to campuses are uneven. Private construction firms report narrow entry-level roles with low wages; government employment retains strong cultural appeal, drawing many graduates into prolonged exam preparation. Faculty across colleges converged on two labour-market frictions. First, limited placements and low starting salaries:

*Placements are limited in civil compared to IT... When construction companies visit, the salary packages are very low, around ₹12,000–15,000." (L4S\_IN\_exp\_2)*

---

Second, a soft-skills bottleneck that undermines otherwise solid technical profiles:

*The main issue is language... Technically, many students are good. But they fail at the last stage levels like group discussions, HR rounds. (L4S\_IN\_pra\_3)*

---

Employers frequently treat communication, teamwork, and problem-framing as threshold skills. Without them, technical ability goes undetected in interview pipelines.

Assessment mode also echoes into employability:

*Exams are now more objective in style... Students prepare only for MCQs and short answers. (L4S\_IN\_exp\_2)*

---

Objective-heavy assessments train students for recall, not explanation. Hiring processes, by contrast, reward articulation of trade-offs and justified design choices. Realigning assessment with these demands could narrow the mismatch.

### 3.2.3 Construction and Vocational

Construction and mechanical trades remain pipelines to Gulf labour markets. Government ITIs report steady domestic absorption combined with episodic overseas recruitment; private ITIs report greater volatility in student motivation and placement follow-through.

An administrator summarised outward mobility:

*From a batch of 24, about 2–3 may go abroad... in Electrical, Construction, and Mechanical, sometimes 10–15 migrate. (L4S\_IN\_pra\_1)*

---

But conversion from selection to joining is not automatic, particularly in private institutions where students juggle multiple short-term options. One principal explained this downside:

*The big issue is job-hopping for quick money... An electrician who drives an auto for two years can't just walk back into electrical work; industry expects continuous hands-on experience. (L4S\_IN\_pra\_2)*

---

Continuous practice matters in craft professions; gaps reset confidence and employer trust. Finally, gender patterns diverge between government and private ITIs:

*About one-third of seats are reserved for girls... Many girls join computer operator, civil, and survey trades. (L4S\_IN\_pra\_1)*

---

Government ITIs' fee waivers, meals, and transport concessions expand access; private ITIs open later in the cycle and compete at a disadvantage.

## 3.3 Migration of STEM, Health and Construction Personnel

A major problem faced by the developing countries is the migration of highly skilled professionals, especially in vital industries such as STEM, healthcare, and construction. According to the Ministry of External Affairs (MEA), almost 15 lakh (1.5 million) students went abroad in 2023. Despite significant public expenditure in education and training, many countries endure consistent outflows of skilled workers seeking better prospects overseas. For example, Indians are estimated to have a 120% income gain by migrating to another country for work, compared to a 40% rise in the case of internal migration. This creates a situation where countries with severe skill shortages continue to lose their educated workforce to international migration.

This pattern is particularly noticeable among healthcare workers. There are bilateral agreements in place between countries for the easier mobility of skilled professionals, such as the Comprehensive Migration and Mobility Partnership Agreement signed in 2019 between India and Germany. This section analyses the reasons that cause skilled migration. It also examines the government incentives and bilateral agreements that control professional mobility, offering insights into how skilled migration is currently managed.

### 3.3.1 Health

Health-sector migration is propelled by a clear vector of incentives: higher real wages, safe staffing ratios, and better facilities abroad, set against low stipends, limited permanent posts,

and slow licensure at home. The Country Profile discusses India's participation in managed programmes (e.g., Triple Win) alongside large volumes of independent mobility. Respondents traced the calculus explicitly:

*For the same work, the compensation abroad ensures a much higher quality of life... Abroad, hours are capped—eight hours means eight hours. (L4S\_IN\_exp\_3)*

*Facilities and technology abroad are more advanced... surgical equipment, radiology infrastructure, and new machines are far better. (L4S\_IN\_exp\_3)*

*Government vacancies are scarce, especially in urban centres... ad-hoc temporary contracts exist, but permanent posts are few. (L4S\_IN\_exp\_3)*

---

Together, these quotes describe a push-pull system that is rational from an individual perspective but leaves origin systems short-staffed, particularly in nursing.

### 3.3.2 STEM

STEM mobility is more varied. Internal migration funnels graduates to Bangalore, Chennai, and Delhi; foreign study and work routes lead to the US, Canada, Europe, and Australia. Inter-corporate transfers to self-placements dominate when it comes to the international mobility of individuals in the STEM sector. Employers in India often recruit engineers into cross-functional roles, or graduates exit to analytics and other allied fields with short bridging courses, due to the limited distribution of opportunities within the country. Most of the STEM-specific jobs are concentrated in two or three big cities in the country. Additionally prolonged nature of government entrance exams and preparations often makes employment abroad as a superior alternative for Indian youth.

Faculty described the pattern with concrete examples:

*Some students have gone to Germany with scholarships... others choose Australia... Germany is more affordable, but the language requirement is a big barrier. (L4S\_IN\_exp\_2)*

*Placements are limited in civil... Many prepare for PSC, railways, banking; some shift into short IT or data courses. (L4S\_IN\_exp\_2)*

*Many civil graduates don't work in civil... Engineering has become like a normal degree for many. (L4S\_IN\_pra\_3)*

---

These choices are not failures; they are adaptive responses to wage differentials, placement patterns, and family expectations. However, they do constitute a leakage from the STEM talent pipeline in the United States.

### 3.3.3 Construction and Vocational

Migration from vocational streams in India is limited to Gulf countries. NCVT certificates are well understood by recruiters in those markets; Europe remains accessible due to the new

openings shaping the labour market, but requires language progression and additional training, which can be time-consuming. Private academies report that a growing share of students now prefer domestic service roles like logistics hubs, aviation ground staff, and hospital administration over traditional construction assignments abroad, redirecting flows toward internal mobility.

Interviewees were specific about volumes and recognition:

*NCVT certificates are accepted in India... In the Gulf they are widely accepted too. (L4S\_IN\_pra\_1)*

*Roughly, about 40% of our students are bright and focused; they do well and succeed abroad... but overseas employers are cautious. (L4S\_IN\_pra\_2)*

---

The service-sector pivot recorded, away from construction diplomas and toward logistics and healthcare administration, suggests future cohorts may anchor domestically first, then reassess migration once experience and credentials deepen.

### 3.4 Conclusion

The evidence portrays a system that produces large numbers of graduates while struggling to convert training into stable, well-matched employment at home. In health, the combination of low stipends, slow licensure, manual systems, and uneven postings feeds outward mobility even as rural facilities remain understaffed. In STEM, long revision cycles, objective-heavy exams, and limited placements outside IT keep many graduates from practising as engineers. In vocational streams, structured hands-on training coexists with job-hopping and limited opportunities, and a youth pivot toward service-sector roles from traditional vocational programmes.

Three field observations summarise the three discussion points explained above:

*Clinical exposure is where real acumen is built... (L4S\_IN\_exp\_3)- protect and modernise this advantage by digitising records and streamlining licensure.*

*The main issue is language... they fail at the last stage- group discussions, HR rounds. (L4S\_IN\_pra\_3)- mainstream communication and teamwork training alongside technical labs.*

*The big issue is job-hopping for quick money..." (L4S\_IN\_pra\_2)- align apprenticeships and early-career wages to reduce churn and preserve skill continuity.*

---

Together they point to a practical agenda:

- (i) update curricula and assessments on a rolling basis
- (ii) expand structured internships and apprenticeships
- (iii) improve stipends and rural posting incentives
- (iv) Upgrade information systems in public hospitals and training institutions
- (v) Scale bilateral arrangements with protective standards.

These changes would shift outcomes from brain drain toward genuine brain circulation and a more balanced triple win for origin, destination, and migrants.

## 4.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – INDONESIA

Authors: Sukamdit, Evita Hanie Pangaribowo, Muhammad Arif Fahrudin Alfana, Mar'a Kamila Ardani Sarajwati, Bernadet Lioni Andri Damayani (Gadjah Mada University).

### 4.1 Training and Education in STEM, Health and Construction

#### 4.1.1 Curriculum Relevance and Graduate Quality

Graduate quality in Indonesia varies widely. Top universities, primarily located in Java, tend to benefit from stronger infrastructure and closer industry linkages, while graduates from less-resourced institutions often lack practical skills (Logli, 2016; Priyono & Nankervis, 2020; Anjarwati & Juliprijanto, 2021; Muttaqin et al., 2025). A key issue is the misalignment between higher education curricula and labour market needs, a gap highlighted in the Indonesian Education Roadmap 2025–2045 (Kementerian PPN/Bappenas, 2024) and intensified by rapid digitalisation and the energy transition.

In Indonesia, higher education curricula generally take two forms: diploma (vocational) programs and bachelor's (academic) programs. Each follows a distinct orientation in preparing students for the labour market. Vocational programs are generally more responsive to employment needs, offering practical skill development and higher graduate employment rates compared to bachelor's programs, which are more research-focused and theoretical.

While STEM is widely offered at universities, construction has a limited presence at the higher education level. Skilled construction workers typically graduate from vocational high schools or lower and train at government-supported training centres called BPVP (*Balai Pelatihan Vokasi dan Produktivitas / Vocational and Productivity Training Centres*) under the Ministry of Manpower. They may also attend training programmes organised by the Ministry of Public Works and Housing (*Kementerian PUPR*), usually through the Directorate General of Construction Development (*Bina Konstruksi*), or take courses at private LPKs (*Lembaga Pelatihan Kerja / Work Training Institutions*). These programmes provide nationally recognised certification in occupations such as welding and electrical work, although fees can be high relative to local incomes, unless covered by government subsidies or free training, which are offered only to a limited number of participants.

On the other hand, nursing education benefits from more standardised and structured curricula overseen by the Ministry of Health. The Core Curriculum for Nursing Education, developed by AIPNI (Indonesian Association of Nursing Education Institutions), aligns the programme with national and global competency standards. At the diploma level (D3), students complete six semesters, earning the title Associate Expert in Nursing. S1 (bachelor) programmes take four years (eight semesters), focusing on management, psychology, emergency, mental health, and public health nursing, with graduates earning the title Bachelor of Nursing. Both D3 and S1 graduates must complete a one-year professional *Ners* programme, involving clinical internships, after which they receive the professional title *Ners* (Registered Nurse), a practice licence (*Surat Tanda Registrasi, STR*), and additional certifications such as BTCLS (Basic Trauma and Cardiac Life Support).

Interviews with graduates suggest that this combination of academic study and practical clinical training sufficiently prepares them for the workforce:

*I think the curriculum is sufficient, because in the bachelor's programme we mainly study theory, while the Ners programme is fully practical, similar to an internship. We interact directly with patients for a year, which I think is enough time. [own translation from Bahasa Indonesia] (see L4S\_ID-AT\_Migrant\_01, p.3, line 31-33)*

This structured combination of academic study, clinical training, and licensing requirements makes nursing one of the few disciplines in Indonesia where graduate readiness is more systematically assured compared to other fields (Sirait & Tiopan, 2018).

In some fields other than nursing, professional licensing ensures graduates are fully prepared for the workforce. Medicine, pharmacy, veterinary, and certain engineering disciplines require licensure, which extends training time but guarantees competence. This structured pathway gives graduates clarity on the skills and standards they must achieve.

#### 4.1.2 Strengths and Weaknesses of Curricula in Meeting Market Demands

Vocational programs (Diploma D1–D4) in higher education are generally more practical and better aligned with labour market demands. For example, D4 programs, equivalent to a Bachelor's degree (S1), emphasise applied skills and apprenticeships with mandatory internships, producing more job-ready graduates. Recent reforms, particularly the MBKM (*Merdeka Belajar–Kampus Merdeka*/Freedom to Learn- Independent Campus) policy, provide bachelor's and diploma (vocational) students with more flexibility to take internships, attend courses at other universities, join entrepreneurship programs, or participate in collaborative research, all converted into academic credits. This approach is especially beneficial for students from less-resourced universities, as it provides access to better facilities and richer learning environments.

However, despite these reforms, bachelor's curricula in many disciplines remain outdated and poorly aligned with industry demands, leaving graduates underprepared for work. Practical application is often limited, forcing graduates to seek additional training, certifications, or costly external courses to become job-ready. As Rendra, a director at the Ministry of Manpower, notes:

*According to our mapping at the Ministry of Manpower, there's a clear gap between the education system and the labour market. For example, someone who graduates with a bachelor's degree in engineering may still not be ready to enter the workforce. They need upskilling through training institutions. This is something we must address. There needs to be a strong link and match between education and the labour market. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p. 6, line 7-14)*

Curriculum regulation is also inconsistent, particularly in STEM fields, which lack standardised oversight, leading to significant variation in curricula across institutions and a slower adaptation to industry needs. Finally, the strong emphasis on research output constrains the

relevance of higher education priorities. Undergraduate students are required to complete a thesis, and in top universities, they are even encouraged to publish it.

While this focus enhances research productivity, it often overshadows the quality of teaching, the student experience, and the broader social and economic value of knowledge and technology transfer (Rachman, 2024).

#### 4.1.3 Standardisation of Informal Training and The Challenges Encountered

Informal training plays a key role in bridging gaps between formal education and employment. The Ministry of Manpower collaborates with sectoral ministries, Vocational Training Centres (BPVPs), and Work Training Institutions (LPKs) to standardise curricula and align them with labour market needs. In construction, the Ministry of Public Works and Housing, via the Directorate General of Construction Development, provides certified training in trades such as welding, bricklaying, and road maintenance. STEM training covers areas like digital office administration, content creation, animation, web development, and network engineering, while health training focuses on competency-based programs such as Basic Trauma and Cardiac Life Support (BTCLS) through professional associations and higher education institutions.

Rendra, A Ministry of Manpower director, explained:

*Due to the gap between education and employment, the Ministry is pushing for stronger roles for vocational training centres like BLK (BPVP) and LPK. Even many SMK (vocational high school) graduates are not job-ready, so we bridge this gap through vocational training. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p.11, line 15-20)*

Since the 2010s, national competency standards, enforced by the National Agency for Professional Certification (BNSP), have formalised professional certification, further strengthened by Presidential Regulation No. 68 of 2022. Competency certificates are issued systematically and objectively through assessments based on SKKNI, international standards, and/or special standards. To enhance training quality and productivity, many BLKs (*Balai Latihan Kerja / Job Training Centres*) have been upgraded into BPVPs (*Balai Pelatihan Vokasi dan Produktivitas / Vocational and Productivity Training Centres*). However, several challenges persist. Limited funding, selective course quotas, and restricted international recognition of certifications remain issues. Moreover, many domestic employers do not consistently acknowledge certificates issued by BLK/BPVPs or LPKs, which reduces the overall effectiveness of these programs.

#### TVET-Industry Partnerships

Internship and apprenticeship initiatives have strengthened the link between education and Indonesia's labour market. Under the *Merdeka Belajar Kampus Mandiri/MBKM* (Freedom to Learn - Independent Campus) policy, the flagship Certified Internship and Independent Study (MSIB) connected diploma (vocational) and undergraduate students with paid projects or internships in over 360 organisations—including Grab Indonesia, Huawei, Bank Indonesia, Lazada, Nestlé Indonesia, and government bodies, counting toward academic credit and improving employability. A survey, for instance, showed that Gadjah Mada University graduates who joined MBKM programmes secured jobs faster (7.6 months on average) than those without such experience (10 months) (Universitas Gadjah Mada, 2024).

Following the 2024 cabinet transition, MSIB was replaced in 2025 by *Magang Berdampak* (Internship with Impact), which currently partners with 22 organisations.

Alongside these higher-education initiatives, the Ministry of State-Owned Enterprises also runs MAGENTA (Talented Generation Internship), offering structured placements in more than 120 state-owned enterprises across various sectors, including finance, technology, manufacturing, energy, and public services. Together, these programmes give students practical skills, workplace insight, and clearer pathways to employment.

Beyond higher education internships, the government vocational training centres partner with local industry for technical training, certification, and apprenticeships—e.g. shipyard schemes in Batam, welding certification in Pariaman, and cement-industry training with PT Semen Padang. International collaboration further strengthens TVET: Austria supports modernising four national training centres; Japan’s Camcom programme prepares training centres graduates for internships; Hyundai Heavy Industry trains welders and electricians for South Korea; and Hungarian companies once offered apprenticeships in STEM fields. These partnerships are outlined in Table 1, which maps key programmes, their lead institutions, partners, and focus sectors.

## 4.2 Labour Market Demand and Supply

### 4.2.1 Skill Mismatch and Labour-Market Constraints

Indonesia possesses a substantial quantitative workforce in human resources. To illustrate, in the healthcare sector, the number of university graduates in nursing in Indonesia has consistently exceeded 30,000 annually from 2019 to 2023, with a steady year-on-year increase.<sup>7</sup> Similarly, in the construction sector, Indonesia has produced over 5,000 new university graduates annually during the same period, reflecting a continuous upward trend<sup>1</sup>. In the field of Science, Technology, Engineering, and Mathematics (STEM), particularly information technology, the number of new university graduates exceeds 95,000 per year on average between 2019 and 2023, a figure projected to continue rising.

---

<sup>7</sup> Indonesian Higher Education Database, 2019–2023

Table 1. Internship, Apprenticeship, and Industry Partnerships Supporting TVET in Indonesia

No	Partnership	Partnership Type	Lead Institution	Partner	Period / Status	Sector & Modality	Key Points
1	Certified Internship and Independent Study Program (MSIB)	Program	Ministry of Education, Culture, Research, and Technology	360+ local & multinational companies, government agencies (in final batch)	2021–2024	Multi-sector; internship project-based study.	For students at public and private higher-education institutions; it aims to strengthen work readiness. <sup>8</sup>
2	Internship with Impact ( <i>Magang Berdampak</i> )	Program	Ministry of Higher Education, Science and Technology	22 organisations	2025 – ongoing	Multi-sector (STEM).	Designed as a replacement for MSIB. <sup>9</sup>
3	Talented Generation Internship (MAGENTA)	Program	Ministry of State-Owned Enterprises (BUMN)	120+ state-owned enterprises ( <i>Badan Usaha Milik Negara – BUMN</i> )	2024 – ongoing	Multi-sector (STEM).	For active students or recent graduates (Diploma, Bachelor, or Master). <sup>10</sup>
4	BSOA Apprenticeship Program	MoU	Department of Manpower Transmigration, Islands Province of Riau	Batam Shipyard Offshore Association	2023 – ongoing	Welding; training followed by field placement.	Participants receive technical training before the on-site

<sup>8</sup> Swasty, R. (2024). *MSIB angkatan 7 bakal digelar, ada pilihan 369 perusahaan*. Retrieved September 12, 2025, from <https://www.medcom.id/pendidikan/news-pendidikan/0kpmnEnK-msib-angkatan-7-bakal-digelar-ada-pilihan-369-perusahaan>

<sup>9</sup> LPM Orange. (2025). *Dinilai menurun, inilah perbedaan drastis Magang Berdampak 2025 dengan program magang terdahulu*. Retrieved September 12, 2025, from <https://orangeuntirta.com/2025/07/12/dinilai-menurun-inilah-perbedaan-drastis-magang-berdampak-2025-dengan-program-magang-terdahulu/>

<sup>10</sup> Magenta BUMN. (2025) *Tentang MAGENTA* [About Magenta]. Retrieved September 12, 2025, from <https://magenta.bumn.go.id/tentang>

							apprenticeship. <sup>11</sup>
5	Technical and Vocational Training – BPVP Padang and PT Semen Padang	MoU	Vocational Training and Productivity Center (BPVP) Padang	PT Semen Padang	2025 – ongoing	Cement-industry skills (manufacturing, welding, electrical, etc.).	Includes competency-based training, apprenticeship, certification, curriculum development, and industry instructors. <sup>12</sup>
6	Development of Maritime Vocational Training and Productivity Centers (BBPVP/ BPVP)	MoU	Ministry of Manpower: (1) BBPVP Medan <sup>13</sup> ; (2) Serang <sup>14</sup> ; (3) Makassar <sup>15</sup> ; and (4) BPVP Banyuwangi <sup>16</sup>	Austrian Federal Ministry of Labour and Economy + contractors	(1) 2019–2022; (2) 2021–2023; (3) 2021–2024; and (4) 2023–2025	Joinery, welding, electrics, tourism, metalwork, automotive.	Austria provides funding, equipment, curriculum, training-of-trainers, and supervision/technical assistance.

<sup>11</sup> Cakrawala Today. (2025). *BSOA dan Disnakertrans Kepri bersatu kurangi pengangguran lewat pelatihan welder*. Retrieved September 12, 2025, from <https://cakrawalatoday.com/2025/07/12/bsoa-dan-disnakertrans-kepri-bersatu-kurangi-pengangguran-lewat-pelatihan-welder/>

<sup>12</sup> Efison, H. (2025). *Kerja sama dengan PT Semen Padang, BPVP Padang rancang program sesuai kebutuhan industri dan tren terkini*. Retrieved September 12, 2025, from Padek: <https://padek.jawapos.com/padang/2365511796/kerja-sama-dengan-pt-semen-padang-bpvp-padang-rancang-program-sesuai-kebutuhan-industri-dan-tren-terkini>

<sup>13</sup> eee Austria. (n.d.). *Maritime vocational training center on tourism and joinery in Medan, Indonesia*. Retrieved September 12, 2025, from <https://eee-austria.com/project/maritime-vocational-training-center-on-tourism-and-joinery-in-medan-indonesia/>

<sup>14</sup> M-U-T Engineering GmbH. (n.d.). *Vocational Training Center (VTC) Serang - Indonesia*. Retrieved September 12, 2025, from <https://www.mut-e.at/serang-vtc>

<sup>15</sup> KIP International Projects GmbH. (n.d.). *International training projects of vocational education and training centers*. Retrieved September 12, 2025, from <https://kip-education.at/references.html>

<sup>16</sup> eee Austria. (n.d.). *Development of vocational training centers for tourism and welding in Banyuwangi, Indonesia*. Retrieved September 12, 2025, from <https://eee-austria.com/project/development-of-vocational-training-centers-for-tourism-and-welding-in-banyuwangi-indonesia/>

7	Indonesia– Japan Camcom Program (IJC)	MoU	Ministry of Manpower and AP2LN (Association of Overseas Apprenticeship Organizers)	Japan Overseas Enterprises Cooperative	2022 – ongoing	Food processing, manufacturing, automotive, electrical, welding, and refrigeration.	Participants (BPVP graduates) receive Japanese-language and technical training before internships in Japan. <sup>17</sup>
8	Internship and Work Program in Hungary <sup>18</sup>	MoU	Markija Berdaya, Indonesian Chamber of Commerce and Industry (KADIN), Indonesian Engineers Association (PII), polytechnics, and vocational schools	GÉMTECH Ltd., Bio Fungi Ltd. (Hungary)	2021 – currently suspended (due to suspected rights violations reported in 2024)	Two-year apprenticeships: electrician, fitter, welder, agricultural technology	For students or alumni <sup>19</sup> ; the programme status is under review due to labour-protection concerns <sup>20</sup> .
9	Hyundai Vocational Training and Certification	MoU	Directorate General of Vocational Training and Productivity Development (Binalavotas), Ministry	Hyundai Heavy Industry (HHI)	2023 – ongoing	Welding, electrical, and painting	Conducted at BBPVP using HHI

<sup>17</sup> Syah, P.K. (2023). *Kemnaker berangkatkan 160 peserta magang ke Jepang*. Retrieved September 13, 2025, from Antara News: <https://www.antaraneews.com/berita/3449304/kemnaker-berangkatkan-160-peserta-magang-ke-jepang>

<sup>18</sup> Kementerian Koordinator Bidang Perekonomian Republik Indonesia. [Coordinating Ministry for Economic Affairs of the Republic of Indonesia] (2023). *Tingkatkan kualitas sumberdaya manusia, Menko Airlangga Lepas Peserta Program Magang ke Hungaria*. Siaran Pers [Press Release]. Retrieved September 13, 2025, from <https://ekon.go.id/publikasi/detail/5186/tingkatkan-kualitas-sumber-daya-manusia-menko-airlangga-lepas-peserta-program-magang-ke-hungaria>

<sup>19</sup> Politeknik Negeri Batam. (2021). *Polibatam MoU dengan Markija Berdaya dalam rangka program magang ke Hungaria*. Retrieved September 13, 2025, from <https://www.polibatam.ac.id/polibatam-mou-dengan-markija-berdaya-dalam-rangka-program-magang-ke-hungaria/>

<sup>20</sup> Cipta, A. (2024). *Merasa jadi korban TPPO, peserta magang ke Hungaria laporkan PT MBB ke Bareskrim*. Retrieved September 13, 2025, from Tempo: <https://www.tempo.co/arsip/merasa-jadi-korban-tpo-peserta-magang-ke-hungaria-laporkan-pt-mbb-ke-bareskrim--50422>

			of Manpower				standards <sup>21</sup> ; it prepares graduates for jobs at HHI or affiliates in South Korea.
--	--	--	-------------	--	--	--	---

---

<sup>21</sup> Mahrofi, Z. (2023). *Kemnaker dan Hyundai Heavy Industry tingkatkan kompetensi tenaga kerja*. Retrieved September 13, 2025, from Antara News: <https://www.antaraneews.com/berita/3481065/kemnaker-dan-hyundai-heavy-industry-tingkatkan-kompetensi-tenaga-kerja>

This growing supply of university-educated labour has prompted a structural transformation within the labour force. This shift is expected to enhance labour productivity and improve the return on investment in education. However, challenges in aligning labour demand with labour supply have led to the emergence of skill gaps. Furthermore, the improvement in workforce quality has not been matched by a corresponding growth in demand for high-skilled labour, resulting in a persistent mismatch within the Indonesian labour market (Hasibuan & Handayani, 2021; Sukanti & Sulistyningrum, 2022; Paramitasari et al., 2024).

As of 2023, Indonesia's labour force included over 15 million university-educated individuals. Despite this significant pool of talent, approximately 800,000 of them remained unemployed. According to Setiadi, an expert in anthropology and labour migration at Gadjah Mada University, Indonesia's capacity to absorb labour remains critically low:

*We are well aware of our economic growth rate and our labour absorption capacity, which is extremely limited. In fact, it can be argued that the absorption rate is possibly less than 20 per cent of the skilled workforce produced. [own translation from Bahasa Indonesia] (see L4S\_ID\_exp\_01, p.7, line 20-23)*

The number of job applicants far exceeds the available vacancies. Even among those who meet the minimum educational requirements, relevant job titles, and work experience, the pool of qualified candidates still falls short of demand. This imbalance indicates that many unqualified individuals continue to apply, reflecting a broader structural constraint of limited employment opportunities in the labour market (Gropello et al., 2011; Paramitasari et al., 2024).

Nevertheless, findings from the *Indonesia Investment Climate Survey* (Almeida, 2021), which is predominantly representative of large-scale, export-oriented, and foreign-owned manufacturing firms, indicate that 40% of firms regard workers' skills as a moderate obstacle to their operations (Gropello et al., 2011). This difficulty stems from employers' challenges in identifying suitable candidates for managerial and professional roles. Similarly, while educational qualifications are generally adequate, finding candidates with appropriate skill profiles remains problematic in sales and production roles. This suggests that the quantity of educated labour does not primarily drive the skill gap in Indonesia, but rather the relevance and quality of education and training.

Moreover, the extensive reliance on private networks and personal connections in job search processes reflects significant friction in labour market matchmaking. This is further substantiated by the low incidence of recruitment across firms or regions, which serves as a clear symptom of a labour market that lacks sufficient liquidity (*illiquidity*).

Vertical mismatch is also widespread in Indonesia. According to the 2018 National Workforce Survey (SAKERNAS), approximately one in three Indonesian workers (32.5%) experienced vertical mismatch, holding higher skills than required, owing to the failure to optimally create employment opportunities for individuals with medium - to high - level skills.

The phenomenon of overqualification, once considered a temporary condition, is no longer tenable. Many highly educated workers face short-term wage penalties, albeit with expectations of long-term upward mobility through promotions. Workers pursue additional education, as higher educational attainment is frequently interpreted by employers as a credible signal of reduced training costs. In some cases, individuals accept positions that exceed their qualification requirements, assuming such roles offer supplementary benefits such as increased leisure time (Wicaksono et al., 2023).

Furthermore, persistent and increasing mismatches have substantial economic and social consequences for workers, employers, and society at large. Educational mismatch correlates positively with skill mismatch and negatively affects job satisfaction. Wage penalties arise when workers are mismatched both horizontally and vertically, resulting in lower earnings compared to peers with better-matched qualifications (Wicaksono *et al.*, 2023). As Rendra, the Ministry of Manpower director, explained:

*Training provided by LPKs affiliated with overseas employment placements results in a 99% job placement rate, sir. In contrast, domestic LPKs achieve only up to a 30% placement rate in the domestic labour market. However, when training is directed toward overseas positions, the placement success rate reaches 99%. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p.12, line 1-5)*

#### 4.2.2 The Paradox of Nurse Surplus and Regional Shortage

Indonesia has already reached the national target for nurse availability. The government, through the Coordinating Minister for People's Welfare's Decree No. 54 of 2013, set a ratio of 2 nurses per 1,000 people for 2025, and this target was surpassed in 2018 with 2.46 nurses per 1,000 inhabitants (Ministry of Health, 2016). This aligns with the statement from Hesti, Director at the Ministry of Foreign Affairs:

*Regarding health personnel, specifically nurses, if I rely on information from colleagues at the Ministry of Health, we actually have a surplus. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_02, p.9, line 25-27)*

Recent figures also support this. As of March 2025, the Ministry of Health registered approximately 784,515 nurses, with projections indicating a need for 40,000–50,000 new nurses annually, while nursing institutions continue to produce around 60,000 graduates per year (Fithriyyah, 2025). Numerically, Indonesia appears to have more than enough.

However, this surplus is not reflected evenly across regions. Since 2018, fewer than 15% of health workers, including nurses, have been deployed to 3T (frontier, outermost, disadvantaged) regions. Most remain concentrated in Java, where infrastructure and job opportunities are better (Harsiwie, Warsida & Setiawan, 2023).

This shows that the ratio of nurses to population is not a sufficient indicator of workforce adequacy. A high number nationally does not guarantee access to services at the local level. More comprehensive measures are needed, ones that also account for distribution, recruitment capacity, and labour-market conditions (WHO, 2016). As Hesti from the Ministry of Foreign Affairs further emphasised:

*Sometimes, WHO portrays us as having a deficit because the issue is actually the unequal geographic distribution of nurses. Many refuse postings in remote areas. Yet in terms of total numbers, we are in surplus. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_02, p. 9, line 28-31)*

In other words, Indonesia does not lack nurses in absolute terms; rather, it lacks nurses where they are most needed.

### 4.3 Labour-Market Challenges in Indonesia's Nursing Workforce

The oversupply of nursing graduates, combined with limited domestic absorption capacity and uneven regional distribution, has contributed to a substantial rise in unemployment among nurses. Each year, an estimated 22,000 to 40,000 nursing graduates remain unemployed, with only around 20% absorbed into the workforce (Anwar, 2023). Low wage levels further discourage retention in the profession (Efendi, 2005). As one practitioner described:

*We have an enormous number of nurses [...]. Our nurses are overflowing. When I visit universities, there is not a single nursing school with fewer than 3,000 students. Where will they go afterwards? Many end up working in unrelated jobs. They serve, working in community health centres, earning salaries of IDR 500,000–700,000 (€26–36) per month, and many remain in such conditions. I travelled across Sumatra, and especially in Java, and there are so many of our nurses. [own translation from Bahasa Indonesia] (see L4S\_ID-DE\_prac\_02, p.12, line 38 ff.)*

Persistent shortages of nurses in health centres also stem from local governments' limited recruitment capacity. Although health is a decentralised responsibility, local authorities face substantial constraints due to budgetary limitations and their reliance on civil-service quota allocations from the central government (Efendi et al., 2022). With only 3,000 nurses absorbed annually in the public sector and another 2,000 in the private sector (Efendi et al., 2013), many nurses are consequently compelled to seek employment overseas, contributing to a notable trend of nurse migration (Kurniati & Efendi, 2012; Efendi et al., 2013).

#### 4.3.1 The Current Issue of Demand and Supply in Construction

In developing countries such as Indonesia, the construction sector is often regarded as a key mechanism for generating employment across the spectrum of unskilled, semi-skilled, and skilled labour. Because construction is a complex economic sector that involves a multitude of stakeholders, it is highly fragmented in Indonesia and is predominantly occupied by small- and medium-sized enterprises (SMEs) whose work quality is frequently questioned (Wirahadikusumah et al, 2011). These firms rely heavily on local workers, the majority of whom are casual daily-wage labourers without certifications and with limited formal education.

A shortage of qualified labour constitutes one of the principal challenges confronting Indonesia's construction industry and jeopardises overall construction quality. Expanding access to training and education is therefore essential for attaining formal certification and enhancing workforce competencies. Conversely, the majority of construction-industry actors in Indonesia, namely the small- and medium-sized construction firms face considerable difficulties in sustaining their businesses and competing with large-scale construction companies. They require extensive collaboration with government entities, foreign investment, and the private sector in order to develop (Siahaan, 2024).

One governmental initiative aimed at strengthening the national construction industry is Law No. 18 of 1999 on Construction Services, which outlines comprehensive aspects of the sector: classification and requirements for construction-service companies, construction contracts, the roles of clients and service providers, and the central role of civil society and professional associations in industry development, all under government support and facilitation (Wirahadikusumah et al, 2011). This legislation was later amended by Law No. 2 of 2017 on Construction Services, which introduced provisions related to the resolution of construction disputes (Cahyono, 2022).

### 4.3.2 Strategies to Promote Student Enrolment in Health, STEM, and Construction

Currently, the Indonesian government is conducting serious efforts to enhance participation in higher education. This commitment is reflected in the Rencana Pembangunan Jangka Panjang Nasional (RPJPN), a 20-year national development planning document serving as the legal foundation for national development planning from 2025 to 2045 (Pusat Studi Perencanaan Pembangunan Regional Universitas Gadjah Mada, 2024). The RPJPN sets a strategic target for Indonesia to achieve a Gross Enrolment Ratio (GER) in higher education of 60% by 2045 (Law no 59 of 2024), a significant increase from the 2023 level of 31.45%. To realise this goal, the government has implemented a range of initiatives aimed at expanding access to higher education.

According to the Deputy for Coordination on Religious Advancement and Moderation within the Ministry of Coordination for Human Development and Culture (Kemenko PMK), economic constraints represent the primary factor influencing the Gross Enrolment Ratio in higher education (Yanuar, 2024). In response, the government, alongside private entities and non-governmental organisations, has established numerous financial assistance programs to support students. Among the most significant government-run initiatives is the *Kartu Indonesia Pintar (KIP) Kuliah*. Funded by the Ministry of Education, Culture, Research, and Technology, KIP *Kuliah* provides financial aid to high school graduates with strong academic potential but limited economic capacity.

Additionally, the *Lembaga Pengelola Dana Pendidikan (LPDP)*, under the Ministry of Finance, offers scholarships for students with high potential to pursue master's and doctoral degrees, both domestically and internationally. To promote geographical equity and reduce the concentration of higher education resources in Java and more developed urban centres, the *Afirmasi Pendidikan Tinggi (ADik)* program provides scholarships to high school graduates from Papua, the 3T regions.<sup>22</sup> (*Terdepan, Terluar, dan Tertinggal* or Frontier, Outermost, and Underdeveloped), and children of migrant workers.

Beyond governmental efforts, private sector actors and non-profit organisations also play a vital role in supporting higher education. For instance, Bank Indonesia<sup>23</sup> provides scholarships for students in banking and finance at partner universities. Furthermore, organisations such as the Tanoto Foundation<sup>24</sup> and Djarum Foundation<sup>25</sup> provide scholarships combined with leadership training and soft skills development to enhance long-term employability and societal contribution. Institutions like Baznas and Dompot Dhuafa also run various scholarship programmes for different socioeconomic groups, helping broaden access to higher education.

<sup>22</sup> 3T Regions refers to a category of regions in Indonesia that are geographically remote from the national center, characterized by limited access to basic infrastructure, and frequently facing substantial challenges in economic, social, and educational development. This term encompasses the most peripheral areas of the country, including the outermost islands, remote mountainous and inland regions, as well as areas marked by high levels of poverty and underdevelopment.

<sup>23</sup> Bank Indonesia is the central bank of the Republic of Indonesia, responsible for managing the nation's monetary policy, payment systems, and financial system stability.

<sup>24</sup> Tanoto Foundation is an independent philanthropic organization dedicated to advancing education in Indonesia. Beyond providing scholarships, the foundation implements transformative programs aimed at improving educational quality, fostering leadership competence, and expanding access to high-quality education for underserved populations, particularly in remote and disadvantaged regions.

<sup>25</sup> Djarum Foundation is a philanthropic organization committed to community empowerment, with a primary mission to enhance the quality of human resources and promote sustainable management of natural resources.

## 4.4 Migration of STEM, Health, and Construction Personnel

### 4.4.1 Motivations to Migrate

Many Indonesian professionals in health, STEM, and construction are drawn abroad by low domestic wages, restricted career progression, and underutilised skills. For nurses, salary is the most significant driver. A prospective migrant preparing to work overseas explained:

*For nurses, I think jobs are always available here — in clinics, public health centres, hospitals, even corporate settings. But salaries differ, and as many know, nurses’ pay in Indonesia is actually low. [...] Near the end of my professional nursing (Ners) programme, I started looking into opportunities abroad, considering the work situation in Indonesia and the fact that nurses’ salaries here are inadequate. [own translation from Bahasa Indonesia] (see L4S\_ID-AT\_migrant\_01, p.4, line 1-5 and line 27-29)*

Salary gaps underscore these motivations. Since 2008, Indonesia has sent nurses to Japan through the Indonesia–Japan Economic Partnership Agreement (IJEPA). Earnings there remain far higher: nurses in Japan receive about JPY 4.5 million annually ( $\approx$  IDR 43.1 million/month; €2,287) (Sharma, 2025), six to ten times the IDR 4–7 million/month (€210–370) typically paid to hospital nurses in Indonesia. As Rendra from the Ministry of Manpower observed:

*Since 2004, nurses in Japan have already been earning above IDR 20 million (per month). Now in 2025, I don’t see that figure moving here (in Indonesia) [...] After 20 years, I feel pessimistic that it will change. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p.23, line 8-10)*

A similar dynamic is evident in STEM and construction, where graduates often struggle to find well-paid roles aligned with their education and training. Some end up in unrelated or informal jobs — not due to a lack of skills but because the domestic labour market absorbs too few qualified workers and suffers from weak transparency. The oversupply of graduates compared with the availability of quality roles has become a serious challenge for Indonesia’s young and expanding workforce. As Setiadi, an expert in anthropology and labour migration from Gadjah Mada University, stated:

*[...] It can be argued that the absorption rate is possibly less than 20 per cent of the skilled workforce produced. The government must make international migration a core policy. [own translation from Bahasa Indonesia] (see L4S\_ID\_exp\_01, p.7, line 22-24)*

This shortage of quality opportunities helps explain why migration is increasingly seen as a pathway to professional growth. Trending hashtags such as #KaburAjaDulu (“just run away first”) capture the frustration of young Indonesians facing stagnant prospects at home.

In response, structured migration pathways have expanded, including programmes open even to high-school graduates. Government-to-government (G-to-G) schemes are particularly trusted because they are more transparent, affordable, and legally secure, with relatively low placement fees. Private agencies also play a major role in widening access.

For example, licensed placement companies such as PT DEAR<sup>26</sup> support nurses preparing for Germany by offering language courses through affiliates and flexible “pay-later” financing for those with limited resources.

Since German employers often reimburse placement fees, migration becomes even more attractive. Similarly, Binawan’s<sup>27</sup> training and placement programmes for nurses heading to Germany and Austria are almost cost-free: they include dormitories, meals, and small incentives for each language-level milestone, making preparation for work abroad both convenient and appealing.

#### 4.4.2 Retention Challenges and Policy Gaps

Indonesia currently lacks a comprehensive policy framework or incentives to retain skilled workers in health, STEM, and construction. Migration is largely regarded as an individual right rather than an issue requiring systematic retention measures. Current migration patterns are therefore driven more by overseas demand than by domestic workforce planning. There are no significant financial incentives, clear career pathways, or structured reintegration programmes to encourage skilled workers to stay or return. The absence of reliable labour-market data and talent mapping further hampers evidence-based planning.

Legally, the Minister of Manpower Regulation No. 17/2019 allows the government to suspend or restrict the placement of Indonesian migrant workers in specific occupations or destinations when the domestic supply is critically low. However, according to a director at the Ministry of Manpower, no comprehensive capacity study exists to inform decisions about which sectors are oversupplied or undersupplied.

We can stop placement to certain professions or countries based on the national supply [...] this is stated in regulations. [own translation from Bahasa Indonesia] (see L4S\_ID\_pol\_01, p.20, line 6–8)

One notable effort to counter brain drain is the LPDP Scholarship, a government-funded programme supporting up to 4,000 Indonesian postgraduate students (Master’s and PhD) annually at leading universities worldwide. Awardees sign a binding agreement to return to Indonesia within 90 days of graduation and subsequently work in the country, or else repay the scholarship and lose future eligibility (Lembaga Pengelola Dana Pendidikan, 2024). LPDP provides generous support — often surpassing other prestigious awards — offering about €1,400 per month in the Netherlands and Belgium, €1,600 in Ireland, and AUD 2,500–2,800 in Australia (LPDP, 2024), compared with DAAD (€1,300), Erasmus Mundus (€1,000), and the Australia Awards Scholarship (AUD 2,250). Recipients also receive settlement allowances, research funds, and publication or conference grants. Special tracks for civil servants and military personnel further encourage scholars already in public service to continue contributing after graduation.

<sup>26</sup> Deutschia Edukasi Adikarya Rekrutmen (PT DEAR) is a recruitment and placement service assisting Indonesians in education, work, and residence in Germany.

<sup>27</sup> Binawan (<https://binawan.co.id/>) offers training and development programs to prepare Indonesian professionals for global workforce competitiveness.

#### 4.4.3 Bilateral and Sectoral Agreements

Indonesia maintains several arrangements regulating the placement of skilled workers in health, STEM, and construction. Most focus on nurses and caregivers, but some cover broader shortage occupations (e.g., welders, electricians, hospitality) or provide open access for young professionals.

These frameworks aim to create transparent recruitment channels, ensure worker protection, and meet partner countries' labour-market needs. Table 2 below provides an overview of the bilateral and sectoral agreements on the migration of health, STEM, and construction personnel.

Table 2. Key Bilateral and Sectoral Agreements Supporting the International Mobility of Indonesian Health, STEM, and Construction Workers

No	Partner Country / Initiative	Start	Status	Main Focus / Notes
1	Japan – Technical Intern Training Program (TITP) <sup>28</sup>	1993	Ongoing	Practical training for semi-skilled workers in multiple industries.
2	Japan – IJEPA (Economic Partnership Agreement) <sup>29</sup>	2008	Ongoing	Nurses & caregivers; structured pathway to licensure and long-term work.
3	Japan – Specified Skilled Worker (SSW) <sup>30</sup>	2019	Ongoing	Placement in 14 shortage sectors, including nursing & construction.
4	South Korea – MoU on the placement under the Employment Permit System (EPS) <sup>31</sup>	2004	Ongoing	For low-skilled workers in the manufacturing industry, through a G-to-G scheme.
5	Germany – MoU on Employment & Labour Cooperation <sup>32</sup>	2020	Ongoing	A broader labour migration framework, including health and technical jobs.
6	Germany – Triple Win Nurses <sup>33</sup>	2021	Ongoing	Sustainable recruitment of nurses; language & orientation support.
7	Austria – MoU on Recruitment of Professionals & Skilled Workers (Red-White-Red Card) <sup>34</sup>	2024	Ongoing	Nurses, welders, electricians, hospitality; fast-track permits for shortage occupations.

<sup>28</sup> Jissho. (n.d.). *Program Magang Yayasan Jissho*. Retrieved September 2, 2025, from jissho.or.id:

[https://jissho.or.id/id/program\\_magang](https://jissho.or.id/id/program_magang)

<sup>29</sup> Ministry of Trade of the Republic of Indonesia. (n.d.). *Indonesia– Japan Economic Partnership Agreement (IJEPA)*.

Retrieved September 2, 2025, from Directorate General of International Trade Negotiations website:

<https://ditjenppi.kemendag.go.id/bilateral/asiaselatan-tengah-timur/jepang>

<sup>30</sup> Ministry of Foreign Affairs of Japan. (n.d.). *Jepang mencari pekerja berketerampilan spesifik!* Retrieved September 2, 2025, from id.emb-japan.go.jp: <https://www.id.emb-japan.go.jp/ssw/>

<sup>31</sup> Global Forum on Migration and Development. (2016, January 25). *Indonesia-Korea MoU Employment Permit System*. Retrieved September 2, 2025, from <https://www.gfmd.org/pfp/ppd/2401>

<sup>32</sup> Kementerian Ketenagakerjaan Republik Indonesia & Bundesagentur für Arbeit. (2020). *Memorandum Saling Pengertian tentang Tenaga Kerja dan Hubungan Kerja* [Memorandum of Understanding on Employment and Labour Cooperation] [Unpublished Memorandum of Understanding]. Ministry of Manpower of the Republic of Indonesia.

<sup>33</sup> Bundesagentur für Arbeit. (n.d.). *Indonesia*. Retrieved September 2, 2025, from <https://www.arbeitsagentur.de/vor-ort/zav/projects-programs/health-and-care/triple-win/indonesia>

<sup>34</sup> Federal Ministry Economy, Energy, and Tourism Republic of Austria. (n.d.). *Qualified Professionals*. Retrieved September 2, 2025, from <https://www.bmwet.gv.at/en/Topics/Business-Location/qualified-professionals.html>

8	Switzerland – Agreement on Exchange of Young Professionals (AYP) <sup>35</sup>	2021	Ongoing	Open to graduates in various fields; they must first secure a job before applying for a work permit under the Young Professionals scheme.
9	Australia – Skills Development Exchange Pilot <sup>36</sup>	2019	Renewed 2023 (to 2029)	Workplace-based training & short-term placement in technical fields.
10	Canada (New Brunswick) – MoU on Health-Sector Placement <sup>37</sup>	2025	Ongoing	G2G recruitment of Indonesian nurses and allied health staff.

#### 4.5 Conclusion

The assessment of Indonesia’s training, labour market dynamics, and migration patterns in health, STEM, and construction reveals a complex interplay between workforce supply, demand, and mobility. While vocational and nursing programmes demonstrate relative strength in structure and outcomes, STEM and construction education continue to exhibit misalignment with industry needs. The national oversupply of graduates, particularly in nursing and STEM, contrasts with low absorption capacity and uneven regional distribution. As a result, the system contributes predominantly to brain drain and brain waste, rather than fostering sustainable brain circulation, as underutilised professionals increasingly seek opportunities abroad.

Policy directions in the migration skill corridor illustrate both progress and limitations. Bilateral agreements such as the Indonesia–Japan Economic Partnership Agreement (JEPA), the Triple Win Programme with Germany, and the Employment Permit System with South Korea have created formalised channels for worker mobility. These frameworks provide legal protection and opportunities for Indonesian professionals; however, the triple-win objective remains only partially realised. Benefits tend to be weighted in favour of destination countries, with limited mechanisms for reintegration, skills transfer, or retention within the domestic labour market.

The shortage-surplus discrepancy between international organisations and local government authorities further complicates policy responses. International perspectives often frame Indonesia as experiencing health workforce deficits, whereas domestic authorities emphasise oversupply, particularly of nurses. This divergence is shaped by inadequate labour-market intelligence, decentralised recruitment constraints, and persistent regional maldistribution. In its current form, migration largely advances destination-country priorities, raising questions about fairness and ethical reciprocity.

<sup>35</sup> The Swiss State Secretariat for Migration. (2025). *Young professionals*. Retrieved September 5, 2025, from <https://www.sem.admin.ch/sem/en/home/themen/arbeitspraktikum.html>

<sup>36</sup> Australian Government. (n.d.). *Skills Development Exchange*. Retrieved September 10, 2025, from Department of Foreign Affairs and Trade: <https://www.dfat.gov.au/trade/agreements/in-force/iacepa/outcomes-documents/outcomes-skills-development/skills-development-exchange>

<sup>37</sup> Kementerian Pelindungan Pekerja Migran Indonesia [Ministry of Protection of Indonesian Migrant Workers of Republic of Indonesia]. (2025, June 3). *Perdana dalam sejarah, Indonesia-Kanada sepakati kerja sama pengiriman PMI tenaga medis jalur G to G*. Retrieved 10 September, 2025, from <https://www.bp2mi.go.id/berita-detail/perdana-dalam-sejarah-indonesia-kanada-sepakati-kerja-sama-pengiriman-pmi-tenaga-medis-jalur-g-to-g>

Moving forward, a more effective and equitable strategy requires three interlinked measures: (1) strengthening curriculum relevance and standardisation to improve alignment with labour market demands, (2) expanding domestic absorption capacity through targeted investment in underserved regions and improved workforce planning, and (3) negotiating bilateral agreements that embed reintegration pathways and skills circulation mechanisms. Without such reforms, Indonesia risks perpetuating cycles of underemployment and outmigration, undermining its long-term human capital development. Conversely, with coordinated interventions, Indonesia has the potential to shift from externally driven outcomes toward a model of mobility that is both ethical and mutually beneficial.

## REFERENCES

- Almeida, R. (2021). Openness and Technological Innovation in East Asia: Have they increased the demand for skills? *SSRN Electronic Journal, April*. <https://doi.org/10.2139/ssrn.1490476>
- Anjarwati, L., & Juliprijanto, W. (2021). Determinan pengangguran terdidik lulusan universitas di Pulau Jawa. *Jurnal Ekonomi Pembangunan, 10*(3), 178-187. <https://doi.org/10.23960/jep.v10i3.280>
- Anwar, S. (2023). *Ada 40 Ribu Lulusan Perawat yang Nganggur Tiap Tahun*. Beritajatim.com. <https://beritajatim.com/ada-40-ribu-lulusan-perawat-yang-nganggur-tiap-tahun>
- Cahyono, J. (2022). *Analisis yuridis Undang-Undang Nomor 2 Tahun 2017 tentang Jasa Konstruksi*. 3(1), 105–116. <https://doi.org/https://doi.org/10.15575/kl.v3i1.17586>
- Efendi, F. (2005). *Kesejahteraan perawat yang terabaikan!* [Nurses Welfare Ignored!]. Retrieved from Pioners PSIK FK Unair: [http://ners.unair.ac.id/materikuliaah/kesejahteraan\\_perawat\\_yang\\_terabaikan](http://ners.unair.ac.id/materikuliaah/kesejahteraan_perawat_yang_terabaikan)
- Efendi, F., Aurizki, G. E., Auwalin, I., Kurniati, A., Astari, L. D., Puspitasari, I. T., & Chong, M. C. (2022). The Paradox of Surplus and Shortage: A policy analysis of nursing labor markets in Indonesia. *Journal of Multidisciplinary Healthcare, 15*, 627–639. <https://doi.org/10.2147/JMDH.S354400>
- Efendi, F., Purwaningsih, M., Qur'aniati, N., Kurniati, A., Singka, E. J. & Chen, C.-M. (2013). Return migration of Indonesian nurses from Japan: Where should they go? *Journal of Nursing Education and Practice, 3*, pp 154.
- Fithriyyah, Y. N. (2025). *Paradoks Perawat Indonesia*. Detik News. <https://news.detik.com/kolom/d-8119914/paradoks-perawat-indonesia>
- Gropello, E. di, Kruse, A., & Tandon, P. (2011). *Skills for the Labor Market in Indonesia: Trends in demand, gaps, and supply*. The World Bank.
- Harsiwie, R. I. P., Warsida, R. Y., & Setiawan, Y. (2023). PMI Tenaga Keperawatan: Bagaimana menangkap peluang di pasar global? *Jurnal Ketenagakerjaan, 18*(3), 228-242. <https://doi.org/10.47198/jnaker.v18i3.214>
- Hasibuan, E., & Handayani, D. (2021). Pengaruh qualification mismatch terhadap upah tenaga kerja di Indonesia. *Jurnal Ekonomi dan Pembangunan, 29*(1), 1–16. <https://doi.org/10.14203/jep.29.1.2021.1-16>

- Kementerian PPN/Bappenas [Ministry of National Development Planning / National Development Planning Agency]. (2024). *Peta Jalan Pendidikan Indonesia 2025-2045* [The Indonesian Education Roadmap 2025–2045]. Jakarta: Kementerian PPN/Bappenas.  
[https://dasibangsida.lhokseumawekota.go.id/assets/upload/file/10\\_Peta\\_Jalan\\_Pendidikan\\_Indonesia\\_2025-2045\\_Bappenas.pdf](https://dasibangsida.lhokseumawekota.go.id/assets/upload/file/10_Peta_Jalan_Pendidikan_Indonesia_2025-2045_Bappenas.pdf)
- Kurniati, A. & Efendi, F. (2012). *Kajian Sumber Daya Manusia Kesehatan*. Review of Human Resources for Health. Jakarta: Salemba Medika.
- Law Number 59 of 2024 on the National Long-Term Development Plan 2025–2045.
- Lembaga Pengelola Dana Pendidikan. (2024). *LPDP scholarship funding components 2024*. Kementerian Keuangan Republik Indonesia.  
[https://lpdp.kemenkeu.go.id/storage/awardee/penerima-beasiswa/panduan/document/guide\\_document\\_1728538444.pdf](https://lpdp.kemenkeu.go.id/storage/awardee/penerima-beasiswa/panduan/document/guide_document_1728538444.pdf)
- Logli, C. (2016). Higher education in Indonesia: Contemporary challenges in governance, access, and quality. In *The Palgrave handbook of Asia Pacific higher education* (pp. 561-581). New York: Palgrave Macmillan US. [https://doi.org/10.1057/978-1-137-48739-1\\_37](https://doi.org/10.1057/978-1-137-48739-1_37)
- Ministry of Health. (2019). *Human resources for health country profiles: Indonesia*. Ministry of Health.
- Muttaqin, M. F., Ahsani, E. L. F., & Wijayama, B. (2025). *Problematika Pendidikan di Indonesia: Tantangan dan Solusi (Mengupas Aspek Sosial, Ekonomi, dan Karakter dalam Pendidikan)*. Semarang: Cahya Ghani Recovery.
- Paramitasari, N., Khoirunurrofik, K., Mahi, B. R., & Hartono, D. (2024). Charting vocational education: impact of agglomeration economies on job–education mismatch in Indonesia. *Asia-Pacific Journal of Regional Science*, 8(2), 461-491. <https://doi.org/10.1007/s41685-024-00333-x>
- Priyono, S., & Nankervis, A. (2020). Graduate work readiness in Indonesia: challenges and opportunities. *Developing the Workforce in an Emerging Economy*, 110-124.
- Pusat Studi Perencanaan Pembangunan Regional Universitas Gadjah Mada. (2024, December 17). *Mengenal Rencana Pembangunan Jangka Panjang Nasional 2025-2045 (bagian 1)*. Retrieved July 10, 2025, from: Mengenal Rencana Pembangunan Jangka Panjang Nasional 2025-2045 (bagian 1): <https://psppr.ugm.ac.id/2024/12/17/mengenal-rencana-pembangunan-jangka-panjang-nasional-2025-2045/>
- Rachman, A. A. (2024). World-class university: Definition and policy model in Indonesian higher education. *Journal of Governance and Global Studies*, 1(1), 1–8.  
<https://journals.ubmg.ac.id/index.php/JGGS>
- Sharma, I. (2025). *Japan nurse salary: Latest experts salary guide 2025*. TerraTern.  
<https://terratern.com/blog/japan-nurse-salary/>
- Siahaan, M. (2024). *Construction industry in Indonesia - Statistics & facts*. Statista.  
<https://www.statista.com/topics/8224/construction-industry-in-indonesia/#topicOverview>

- Sirait, Y. H., & Tiopan, D. (2018). Politik hukum pengaturan profesi perawat dalam upaya standardisasi masyarakat ekonomi ASEAN (MEA). *Jurnal IUS: Kajian Hukum dan Keadilan*, 6(1), 91-109.
- Universitas Gadjah Mada. (2024). *Research: MBKM shortens job search time for graduates*. <https://ugm.ac.id/en/news/research-mbkm-shortens-job-search-time-for-graduates/>
- Wicaksono, P., Theresia, I., & Al Afa, B. (2023). Education–occupation mismatch and its wage penalties: Evidence from Indonesia. *Cogent Business and Management*, 10(3). <https://doi.org/10.1080/23311975.2023.2251206>
- Wirahadikusumah, R. D., & Pribadi, K. S. (2011). Licensing construction workforce: Indonesia’s effort on improving the quality of national construction industry. *Engineering, Construction and Architectural Management*, 18(5), 431–443. <https://doi.org/10.1108/096999811111165158>
- World Health Organization. (2016). Global strategy on human resources for health: Workforce 2030. In *WHO*. [https://www.who.int/hrh/resources/global\\_strategy\\_workforce2030\\_14\\_print.pdf?ua=](https://www.who.int/hrh/resources/global_strategy_workforce2030_14_print.pdf?ua=)
- Yanuar. (2024, July 31). *Upaya Meningkatkan APK Pendidikan Tinggi*. Retrieved July 2, 2025, from Berita Puslapdik: <https://puslapdik.dikdasmen.go.id/upaya-meningkatkan-apk-pendidikan-tinggi/>

## 5.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION COUNTRY – MOROCCO

Author: Mehdi Lalou, AMI

### 5.1 Training and Education in STEM, Health, and Construction in Morocco: Curricula, Labour-Market Alignment and the Standardisation of Informal Skills

Since the 2000s, Morocco has undertaken large-scale reforms of its education and training systems, driven by demographic expansion, rapid economic transformation, and rising demand for skilled labour, inside and outside the country. Three sectors - Health, STEM, and Construction - illustrate some of the country's most pressing challenges, in particular: ensuring that graduates possess the competencies required by employers, bridging the gap between theoretical training and practical skills, and integrating a large informal workforce into recognised certification pathways. Together, these issues lie at the heart of Morocco's labour-market strategy and its wider ambitions to position itself as a continental hub for innovation and economic development.

#### 5.1.1 Curricula and the Quality of Graduates in Health, STEM and Construction Health Sector

Morocco's health training landscape is dominated by public institutions<sup>38</sup>. The curricula in medical education have undergone several reforms, including the reduction of medical training from seven to six years and the adoption of competency-based frameworks. Medical curricula combine theoretical instruction with clinical internships in university hospitals (CHU), which remain the backbone of practical learning.

However, the quality of graduates is shaped by uneven training environments. Clinical exposure is often limited by overcrowded CHU services, insufficient supervision, and shortages of specialised equipment<sup>39</sup>. Nursing and paramedical training suffer similar constraints, with major regional disparities. As a result, many young professionals feel under-prepared for autonomous practice, contributing to dissatisfaction and, in many cases, emigration intentions.

Overall, while the health curricula formally meet labour-market needs, the system struggles to produce the volume and practical readiness required<sup>40</sup>. Shortages are particularly acute in nursing, anaesthesia, emergency care, and public health specialities.

#### STEM Sector

Morocco has a long tradition of engineering education through flagship institutions such as EMI, ENSA, INSEA, and INPT<sup>41</sup>. These institutions train thousands of engineers annually in civil engineering, IT, telecommunications, statistics, renewable energy, and industrial engineering.

STEM curricula have increasingly integrated practical modules, laboratory work, internships, and partnerships with industry.

<sup>38</sup> Morocco, Ministry of Health and Social Protection, Rabat. Carte Sanitaire, 2023. In French.

<http://cartesanitaire.sante.gov.ma/offresoins/>

<sup>39</sup> World Health Organisation Data. <https://data.who.int/countries/504>

<sup>40</sup> Ministère de la Santé. <https://www.sante.gov.ma/Pages/Accueil.aspx>

<sup>41</sup> Ministère de l'enseignement supérieur. Statistiques de l'enseignement supérieur. Année universitaire 2024/2025. In French. <https://www.enssup.gov.ma/en/statistiques>

Engineering schools maintain close relationships with employers in the telecommunications, automotive manufacturing, aerospace, and digital services sectors. Many programmes integrate project-based learning and innovation challenges<sup>42</sup>.

Despite these strengths, employers frequently highlight gaps. University STEM graduates - especially from generalist science faculties - often lack operational digital competencies such as programming, data analysis, cybersecurity, AI, and industrial automation. Soft skills are also insufficiently developed. These disparities contribute to high unemployment among bachelor-level science graduates, while employers simultaneously report shortages of qualified engineers and technicians. Thus, although STEM curricula are strong academically, they do not consistently produce profiles adapted to Morocco's evolving industrial and digital economy.

### **Construction Sector**

Training in construction is primarily delivered through the OFPPT<sup>43</sup>. Curricula are oriented toward practical learning, including workshop-based instruction and mandatory internships.

Employers generally value OFPPT graduates for their hands-on competencies, but they frequently point to gaps in technical precision, safety culture, and adaptation to new technologies. The sector's rapid evolution due to major infrastructure and real-estate projects requires workers who are both skilled and adaptable.

The construction sector is also marked by high informality and reliance on workers with little or no formal training. This pressures vocational institutions to update training modules and design short, flexible programmes that respond to employer needs.

## **5.1.2 Strengths and Weaknesses of Curricula in Meeting Labour-Market Demands**

Across the health, STEM, and construction sectors, several common strengths stand out.

### **Strengths**

- Strong theoretical foundations across all sectors, especially in engineering and medical education.
- Growing emphasis on practical training, with expanded internships, laboratory work, and project-based learning.
- Structural reforms, particularly in health education and vocational training—that aim to modernise curricula and accelerate the production of skilled professionals.
- Institutional partnerships with industry, especially in STEM and construction, allowing students to engage in real-world projects (See appendix).
- Increasing diversification of training pathways, including the emergence of private schools, coding academies, and bootcamps.

<sup>42</sup> US Embassy & Consulates. March 21, 2023. <https://ma.usembassy.gov/fr/lancement-du-programme-stem-for-sustainability-destine-a-la-jeunesse-du-maroc/>

<sup>43</sup> OFPPT (Office of Vocational Training and Employment Promotion). Métiers du bâtiment et des travaux publics. [https://www.ofppt.ma/sites/default/files/publications/Depliant\\_OFPPT\\_BTP\\_0.pdf](https://www.ofppt.ma/sites/default/files/publications/Depliant_OFPPT_BTP_0.pdf)

## Weaknesses

Despite these strengths, curricula often fall short of labour-market expectations.

- High theoretical content in many STEM and health curricula that does not translate into operational competencies.
- Regional inequalities in training quality, with major gaps between regions hosting large institutions (in the North-West of the country) and those with limited resources (in the South and the South-East).
- Shortages of qualified trainers and supervisors, particularly in nursing and vocational construction programmes.
- Mismatch between graduate aspirations and job realities, contributing to brain drain in health and STEM sectors.

These weaknesses contribute to structural shortages - in nurses, medical specialists, IT engineers, qualified technicians - and to the persistent coexistence of graduate unemployment and unmet employer demand.

Ultimately, Morocco's health, STEM, and Construction training systems reveal a complex interplay between solid institutional foundations, ambitious reforms, and persistent structural challenges. Curricula often offer strong theoretical content and growing practical components, yet they struggle to fully meet labour-market needs in a context of rapid demographic, technological, and economic change. Standardising informally acquired skills remains central to improving the quality of the workforce, especially in construction and digital sectors, but significant obstacles—ranging from institutional capacity to worker vulnerability—continue to limit progress.

A comprehensive strategy combining curricular reform, investment in practical training, enhanced partnerships with industry, and more robust certification pathways for informal workers will be essential for Morocco to close skill gaps, retain qualified professionals, and sustain its long-term economic transformation.

## 5.2 Labour Market Demand and Supply

The Moroccan labour market remains characterised by structural imbalances between the supply of skills and employer demand. National data show a persistent mismatch: more than one-third of higher-education graduates experience *déclassement*, while over 50–55% of vocational and technical graduates (techniciens, techniciens spécialisés, mid-level diplomas) work below their qualification level (HCP 2023). Morocco also records one of the highest graduate unemployment rates in the MENA region, primarily due to a misalignment between academic pathways and labour market needs (World Bank, 2021). Across the health, STEM and construction sectors, the mismatch stems from recurrent structural mechanisms: the overproduction of generalist academic profiles, chronic underinvestment in mid-level technical training, limited employer involvement in curriculum design, and uneven territorial labour absorption.

The World Bank's Jobs Landscape report further notes that weak career guidance at the secondary level pushes many students toward oversaturated academic tracks, reinforcing unemployment

among advanced degree holders (World Bank 2021). Institutional actors also emphasise pressures arising from international labour demand. German institutions highlight that European needs increasingly concern medium-skilled workers, particularly in construction, STEM/IT and nursing: “the need is on medium skilled... and the sectors of highest demand are construction, STEM, IT and nursing” (L4S\_transcript\_MA-DE\_prac\_3, p.1, lines 1–15).

### 5.2.1 Health Sector: Structural Shortages and Recruitment Bottlenecks

Despite increases in training capacity, Morocco continues to face a profound shortage of health professionals. WHO (2023) reports only 15.5 nurses and doctors per 10,000 inhabitants, well below the global benchmark of 44.5, with an estimated deficit exceeding 65,000 positions. Yet nursing graduates frequently face delays in labour-market entry due to slow public recruitment cycles, restrictive budget procedures and severe territorial imbalances.

The Ministry of Health’s Human Resources Strategy (2025) confirms that recruitment bottlenecks explain why unemployment among newly trained nurses coexists with shortages, particularly in rural regions and specialised units. For this reason, the health sector has been excluded from mobility partnerships in the Morocco–Germany corridor: “this need had to be guaranteed first in Morocco; therefore, mobility schemes could not be implemented” (L4S\_transcript\_MA-DE\_prac\_4, p.4, lines 20–23).

Policy responses include expanding national training capacity, opening private nursing institutes and incentivising deployment in underserved regions (Ministry of Health 2025; WHO 2023). Domestic needs therefore override migration objectives in this sector.

### 5.2.2 STEM Sector: Surplus of Graduates and Shortage of Technicians

While engineering graduates generally experience favourable labour-market integration, Morocco faces a structural shortage of mid-level technical workers. Declassement affects nearly half of DEUG science graduates (49.5%), more than one third of licence graduates (35.9%) and up to 55.8% of techniciens spécialisés (HCP 2023). At the same time, fewer than 10% of students pursue technical STEM training, despite its strong and rising labour demand (OFPPT 2023).

These imbalances reflect misalignment between training content and employer needs in fields such as electromechanics, industrial maintenance, digital systems, automation and mechatronics. German and Moroccan employment agencies similarly report that medium-skilled STEM profiles represent the most realistic avenue for mobility cooperation (BA & ANAPEC 2023). As noted in one interview: “high skills might be brain-drained... but medium skills remain different” (L4S\_transcript\_MA-DE\_prac\_3, p.1, lines 11–15).

According to the World Bank (2023), rapid industrialisation, particularly in automotive, aerospace, and renewable energy, will generate significant shortages of mid-level technicians within the next decade.

### 5.2.3 Construction Sector: From Surplus to Domestic Shortages

Construction has undergone the fastest transformation. Traditionally marked by labour surplus and informality, the sector has shifted toward domestic shortages, driven by large infrastructure and urban development projects, including preparations for the 2030 World Cup and post-disaster

reconstruction. HCP (2024) reports steep increases in demand for skilled workers in masonry, metalwork, electricity and plumbing since 2022, outpacing national training capacity.

As a result, the sector is no longer suitable for outward mobility. ANAPEC and GIZ note that domestic labour needs have risen sharply: “with all the construction projects... domestic labour needs are increasing. Therefore, there are fewer possibilities for people to leave” (L4S\_transcript\_MA-DE\_prac\_4, p.5, lines 2–7). Projections by the Ministry of Equipment (2023) indicate that shortages will persist until at least 2030.

#### **5.2.4/ Cross-Cutting Dynamics: Mobility, Mismatch and Governance**

Three cross-cutting insights emerge:

##### ***a/ Simultaneous unemployment and shortages***

Morocco combines high graduate unemployment, driven by oversupply in low-absorption academic fields, with shortages in technical and applied occupations (World Bank 2023). These phenomena are interdependent rather than mutually exclusive or contradictory.

##### ***b/ Asymmetric interaction between mobility and domestic needs***

Mobility schemes operate only in sectors where domestic supply remains adequate (mechatronics, metallurgy), while sectors under pressure, health and construction, remain closed.

##### ***c/ Procedural complexity and data limitations***

Skills recognition, language requirements and administrative procedures significantly slow mobility implementation. As one respondent notes: “there are too many legal options, but no one understands them... it’s immensely complex” (L4S\_transcript\_MA-DE\_prac\_3, p.1, lines 3–6). Although OFPPT and the Ministry of Health have introduced digital HR systems, Morocco is still developing a coherent national skills observatory (UNESCO-UNEVOC 2022).

#### **Partial Conclusion**

Morocco’s labour market displays a layered configuration of mismatch: oversupply in generalist higher education; chronic underproduction of mid-level technical skills; rigid public recruitment procedures; territorial disparities in labour absorption; and strong international demand pulling skilled workers abroad. Forecasts suggest that shortages in health professions, STEM technical occupations and construction trades will intensify unless supply-side reforms accelerate (World Bank 2023; WHO 2023; OFPPT 2023).

In this context, unemployment, shortage and skilled emigration form a mutually reinforcing system embedded in Morocco’s socio-economic trajectory.

### **5.3 Migration of Personnel in the STEM, Health and Construction Sectors from Morocco**

Morocco’s labour market, shaped by sustained demographic growth and economic restructuring continues to face major challenges: persistent unemployment, a structural mismatch between skills supply and employer demand, and low participation rates among youth and women (HCP 2023; World

Bank 2023). These dynamics strongly influence patterns of skilled emigration in the health, STEM and construction sectors.

### 5.3.1 Health Sector: High Emigration Pressure and Persistent Domestic Shortages

The health sector illustrates the most acute form of skills loss. Each year, Morocco loses an estimated 600 to 700 doctors to emigration—representing nearly 30% of newly trained physicians (FEML 2023)<sup>44</sup>. This phenomenon affects all categories, from medical students and general practitioners to specialists and university professors. According to the survey conducted by the Fondation, the main reasons for departure include financial motivations, the search for better working conditions, opportunities for continuing training and career development, access to cutting-edge medical technology, conflicts with the administration and family considerations.

Nurses constitute a substantial share of the health workforce exodus. Morocco faces a deficit of more than 65,000 nurses (Ministry of Health 2022; WHO, 2023), and yet both newly graduated and experienced nurses increasingly seek opportunities abroad. Factors driving this outflow include difficult work environments, lack of recognition, perceived discrimination in promotion, limited career progression and the absence of meaningful pathways for improving living conditions. At the same time, destination countries actively recruit Moroccan nurses, drawn to their high-quality training and professional adaptability.

### 5.3.2 Institutional Governance of International Recruitment

International recruitment of Moroccan talent is conducted primarily through public, structured, and ethical channels involving national employment authorities. The National Agency for the Promotion of Employment and Skills (ANAPEC) acts as a central intermediary, ensuring that mobility schemes respect both Moroccan labour-market needs and international standards of fair recruitment (ANAPEC, 2023).

ANAPEC's approach explicitly avoids destabilising sensitive sectors. As underlined by an ANAPEC representative: *"We do not target candidates who are already employed in Moroccan companies"* (ANAPEC interview, 2024). A consultation mechanism is used to prevent recruitment in sectors considered vital for national development, such as public health, aeronautics, where Morocco has made major investments, and certain ICT occupations currently under stress.

In construction, Morocco historically received few international recruitment requests (except in fibre-optic installation), but the sector is now experiencing growing domestic pressure due to major infrastructure projects and preparations for the 2030 World Cup (Ministry of Equipment 2023). This new labour demand is expected to reduce the feasibility of outward mobility schemes in construction. Despite institutional safeguards, many Moroccan professionals continue to be recruited through direct sourcing or private intermediaries, sometimes bypassing public channels and ethical frameworks.

---

<sup>44</sup> Foundation of Teachers and Liberal Physicians, 'The Exodus of Medical Skills (in) Morocco'. (book in Arabic, English, and French). Rabat, 2023.

### 5.3.3 Retention Policies and Government Measures

These developments raise questions about the effectiveness of public policies designed to retain highly skilled workers. In the health sector, the government has expanded annual budgeted posts to 5,000, introduced a salary increase of 3,000 dirhams for public-sector doctors, and adopted Law No. 09-22, which establishes essential guarantees for health-sector personnel, including mandatory continuing training and the possibility for certain categories to work for private institutions under regulated public–private partnership schemes (Government of Morocco 2023).

A new draft law on the organisation of the health profession further seeks to improve working conditions and recognise the efforts of public-sector health personnel (Ministry of Health 2024). The seriousness of the situation is illustrated by Morocco’s request that Québec suspend recruitment of Moroccan nurses starting in 2024, reflecting heightened concern about the fragility of the national health workforce (Québec Ministry of Health, 2024).

### 5.3.4 Bilateral Agreements and Talent Partnerships

Morocco has developed an increasingly structured framework of bilateral agreements and memoranda of understanding governing the migration of workers in the health, STEM and construction sectors. These include partnerships with Germany, Italy, Belgium, Gulf countries and Canada (MIPEEC 2023). A flagship example is the placement agreement between ANAPEC and the German Federal Employment Agency (Bundesagentur für Arbeit-BA). Initially focused on three construction-related profiles, this agreement enables German employers to recruit through accelerated procedures for work permits and placement authorisations.

As explained by the Director of International Placement at ANAPEC:

*The objective is to allow companies operating in these sectors to recruit through this placement agreement, using an accelerated and facilitated recruitment and work-permit procedure through our two public employment services. (ANAPEC interview, 2024).*

These bilateral mechanisms are supported by EU-funded programmes, notably THAMM and THAMM+, which have enabled pilot talent-partnership schemes between Morocco and Germany. A joint Moroccan-German migration working group has been established to steer cooperation, and a broader “migration agreement” between the two States is currently being expanded.

On the Moroccan side, institutional capacities have been strengthened: ANAPEC has created a Directorate for International Placement, the Ministry of Employment (MIPEEC) coordinates all relevant national actors (sectoral ministries, OFPPT, Ministry of Foreign Affairs, Ministry of Interior), and Moroccan-German Information Spaces, now integrated into the European-Moroccan ZME programme, provide guidance to candidates in the regions (GIZ 2023).

### 5.3.5 Towards a Structured Mobility Partnership

The Morocco-Germany corridor increasingly reflects the new paradigm of EU Talent Partnerships, aiming to organise mutually beneficial professional mobility rather than unregulated recruitment. Public officials in both countries describe the relationship as transparent, balanced and cooperative. As an ANAPEC representative notes: *“I consider this partnership exemplary and respectful. If something does not suit us, we say it directly to each other.”* The GIZ echoes this view: *“The governance system works... the actors know each other and understand how both countries function.”*

Overall, the Morocco–Germany corridor is evolving into a structured competence-mobility partnership, grounded in formal agreements, coordinated governance and ethical recruitment, rather than informal or purely private dynamics.

#### 5.4 Market Dynamics, Bilateral Agreements and Ethical Governance

Since the mid-2010s, Morocco has found itself at the intersection of profound transformations affecting its education and training system, its labour market, and its migration relations with Europe and North America. In the health, STEM (science, technology, engineering and mathematics) and construction sectors, three strategic domains for national development — training capacities have expanded, yet remain insufficiently aligned with actual labour-market needs, both in terms of volume and quality. Public universities and engineering schools, despite notable progress, struggle to meet the national demand for specialised skills, while vocational training centres produce a large number of graduates whose employability nonetheless varies significantly from one training track to another.

In the health sector, structural dysfunctions are particularly visible: chronic shortages of physicians, insufficient numbers of nurses and mid-level health professionals, unequal geographical distribution of specialists between urban and rural areas, and a heavy workload in public hospitals. Institutional bottlenecks (limited training and internship capacities, comparatively low attractiveness of the public sector, administrative delays, especially in the recognition of foreign medical degrees, etc.) contribute to a dynamic in which qualified professionals increasingly look abroad for better working conditions, faster promotion prospects and significantly higher salaries. Consequently, potential destination countries, especially in Western Europe and Canada, exert a powerful pull on human-resource profiles that may feel undervalued at home.

In STEM and construction, the situation displays a dual configuration. On the one hand, Morocco is experiencing growing demand for engineers, technicians and skilled construction workers, driven by industrial investments (automotive, aeronautics, non-conventional water resources, renewable energy, etc.) and major infrastructure projects (large stadiums linked to up-coming Africa Cup of Nations and the 2030 FIFA World Cup, high-speed train lines, large-scale construction developments). On the other hand, opportunities abroad remain very attractive, in France, Germany, Spain, Canada and the Gulf states, all of which actively recruit medium- and high-skilled profiles to address their own shortages in key sectors.

These dynamics produce several contrasting effects for Morocco:

- Brain drain in certain specialities, particularly general medicine, several medical subspecialties (including anaesthesia and intensive care), specific engineering branches, and skilled occupations in construction and public works.
- Brain circulation, through temporary migration, return migration, remittances and continuing training abroad. Such mobility can, in theory, benefit both sides when return pathways and knowledge transfer are effective, a scenario that remains only partially observable in Morocco.
- Human resources waste, when Moroccan professionals who are under-recognised or insufficiently accredited abroad occupy jobs below their actual skill level, a phenomenon well documented in Europe and North America.

Skilled mobility from Morocco is therefore an ambivalent process: it reflects the growing opportunities offered by a global skills market that increasingly transcends borders, while also exposing internal systemic weaknesses, institutional, organisational, social, and structural in national systems of training, labour-force integration, and career development.

### **Bilateral Agreements and Mobility Partnerships: Towards a “Triple Win” or an Asymmetric Framework?**

Since 2013, under the combined effect of regional migration pressures and increasing demand for qualified labour in several European countries, Morocco has multiplied its migration-cooperation instruments. The *Mobility Partnership* signed with the European Union remains the most emblematic overarching framework. It provides for the facilitation of professional mobility, cooperation on training, joint border management, and readmission procedures. Alongside this agreement, Morocco has developed sector-specific bilateral arrangements with France, Spain, Germany and the United Kingdom.

Despite these advances, outcomes remain uneven. In certain instances, particularly seasonal agricultural programmes with Spain or engineer-focused recruitment agreements with Germany, tangible benefits can be observed. These include improved earnings and upskilling opportunities for some workers, a partial response to labour shortages in destination countries, and the transfer of financial resources and occasionally technical know-how back to Morocco.

However, such mechanisms do not yet amount to a genuine “triple win” for three main reasons:

- a/ Limited recognition of qualifications. The absence of systematic harmonisation of diplomas restricts upward mobility and limits the potential for skills acquisition abroad.
- b/ Insufficient benefits for Morocco’s national system. Very few agreements incorporate structural contributions to the training of trainers, investments in pedagogical infrastructure, or formalised return pathways enabling reintegration and knowledge transfer.
- c/ Institutional asymmetry influenced by unequal bargaining power. These instruments are often designed primarily to meet the demographic and economic needs of European countries, rather than to align with an endogenous Moroccan strategy for skills development or broader economic transformation.

Thus, despite notable political progress, the current architecture of bilateral agreements and mobility schemes does not guarantee genuine reciprocity, nor does it significantly strengthen Morocco’s national human-capital base.

#### **Appendix:**

Concrete TVET– industry partnerships in Morocco  
& Renault Group — *École Mohammadia d’Ingénieurs (EMI)*<sup>45</sup>

<sup>45</sup> Media24, December 17, 2018. <https://medias24.com/2018/12/17/automobile-renault-maroc-et-lecole-mohammadia-dingenieurs-sallient/>

A Formal Partnership/Convention to support engineering programmes, internships and joint R&D (doctoral chair) oriented to the automotive industry. This Convention links EMI's curricula and research directly to Morocco's automotive ecosystem and student placements.

& OFPPT — Groupe Renault Maroc (sector-wide training agreement, 2023)<sup>46</sup>

Two conventions have been signed (23 March 2023) between OFPPT, the Ministries and Renault Maroc to reinforce professional training for the automotive sector — curriculum development, apprenticeships and meeting the group's HR needs.

& Safran (Aerospace French group) — Moroccan authorities / higher-education & TVET ecosystem (aerospace cooperation)<sup>47</sup>.

Framework agreements and industrial investments to support aerospace ecosystem development, including commitments to skills development and training for aerospace supply chains. (Safran announced strengthened partnerships in 2023 and further investment steps in October 2025.) This framework illustrates industry-led capacity building in a strategic high-tech sector where TVET and specialised institutes are critical.

& OFPPT — EU / international partners (tech-textile & sectoral upskilling projects, 2024)<sup>48</sup>.

OFPPT hosted European partners for projects like TECH-TEX and other cooperation efforts (June 2024) aimed at sectoral upskilling, curriculum modernisation and trainer exchanges.

The TECH-TEX project aims to modernize Morocco's vocational training system by developing 20 cutting-edge modules focused on sustainability, digitalization, and green innovation; Training-of-trainer programs in Europe will ensure knowledge transfer and build local capacity. Pilot courses will be implemented at the Moroccan institutions to test the curriculum.

The Curriculum developed for the TECHTEX project is structured to address the specific needs of the technical textiles sector in Morocco, aligning with sustainability, innovation, and industry requirements.

## SELECTED REFERENCES

ANAPEC (Agence nationale de Promotion de l'emploi et des compétences/National Agency for the Promotion of Employment and Skills), "Offres d'emplois à l'International".  
<http://www.anapec.org/sigec-app-rv/>

European Commission (2013). *EU–Morocco Mobility Partnership*. Brussels. June 7, 2013.  
[https://ec.europa.eu/commission/presscorner/detail/en/ip\\_13\\_513](https://ec.europa.eu/commission/presscorner/detail/en/ip_13_513)

Government of Morocco (2019). *Programme de Réforme du Système de Formation Professionnelle*. Rabat.

<sup>46</sup> Morocco World News. Morocco, Renault Sign 2 Agreements to Boost Training in Automotive Industry. March 24, 2023 <https://www.morocoworldnews.com/2023/03/35122/morocco-renault-sign-2-agreements-to-boost-training-in-automotive-industry/>

<sup>47</sup> Safran, Safran strengthens its strategic partnership with Morocco. December 6, 2023. <https://www.safran-group.com/pressroom/safran-strengthens-its-strategic-partnership-morocco-2023-12-06>

<sup>48</sup> European Union, Techtex: New perspectives for skill development in the technical textile sector in Morocco. January 8, 2025.  
<https://epale.ec.europa.eu/en/blog/techtex-new-perspectives-skill-development-technical-textile-sector-morocco>

Haut-Commissariat au Plan (HCP) (various years). *Enquête Nationale sur l'Emploi*. Rabat.  
[www.hcp.ma](http://www.hcp.ma)

Ibourk, A. & Ghazi, T. (2024), "Un élan nouveau pour l'intermédiation : Maximiser les acquis pour dynamiser le Marché du Travail au Maroc". Document in French. Policy Center for the New South. [https://www.policycenter.ma/sites/default/files/2024-06/Aomar%20Ibourk%20et%20Tayeb%20Ghazi%20P\\_R\\_%20INTERMEDIATION\\_A\\_T.pdf](https://www.policycenter.ma/sites/default/files/2024-06/Aomar%20Ibourk%20et%20Tayeb%20Ghazi%20P_R_%20INTERMEDIATION_A_T.pdf)

International Labour Organization (ILO) (2022). *Skills for Jobs Database. Exploring skills mismatches*  
<https://www.ilo.org/resource/other/exploring-skills-mismatches>

Kingdom of Morocco, "The New Development Model - Releasing energies and regaining trust to accelerate the march of progress and prosperity for all". General report. April 2021.  
<https://csmd.ma/documents/Summary.pdf>

Ministère de la Santé, Maroc. In French. <https://www.sante.gov.ma/Pages/Accueil.aspx>

Ministère de l'enseignement supérieur, Maroc. Statistiques de l'enseignement supérieur. Année universitaire 2024/2025. In French. <https://www.enssup.gov.ma/en/statistiques>

Ministry of Health – Health in figures. Rabat, 2022. (In French).  
<https://www.sante.gov.ma/Documents/2024/02/Sante%20en%20chiffre%202022%20VF1.pdf>

Ministry of Health and Social Protection (Morocco) (2021). *Stratégie Nationale de Santé 2025*. Rabat.  
[https://extranet.who.int/countryplanningcycles/sites/default/files/public\\_file\\_rep/MAR\\_Morocco\\_Plan-de-sant%C3%A9-2025.pdf](https://extranet.who.int/countryplanningcycles/sites/default/files/public_file_rep/MAR_Morocco_Plan-de-sant%C3%A9-2025.pdf)

OECD Economic Surveys: Morocco 2024. Economic assessment. November 22, 2024.  
[https://www.oecd.org/en/publications/oecd-economic-surveys-morocco-2024\\_80777ea7-en.html](https://www.oecd.org/en/publications/oecd-economic-surveys-morocco-2024_80777ea7-en.html)

OFPPT (Office of Vocational Training and Employment Promotion). *Métiers du bâtiment et des travaux publics*.  
[https://www.ofppt.ma/sites/default/files/publications/Depliant\\_OFPPT\\_BTP\\_0.pdf](https://www.ofppt.ma/sites/default/files/publications/Depliant_OFPPT_BTP_0.pdf)

World Bank (2024), Morocco Economic Update Unlocking the potential of the private sector to spur growth and job creation, Washington, DC.  
<https://documents1.worldbank.org/curated/en/099826007162422517/pdf/IDU12f69bf581e7fa144061b0cf15dc97f2b2bbd.pdf>

World Health Organisation, WHO (2023), Global Health Workforce statistics database. (Last update, 30/4/2025). <https://www.who.int/data/gho/data/themes/topics/health-workforce>

## 6.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – NIGERIA

Author: Olayinka Akanle, University of Ibadan

### 6.1 Methodology

This report is based on primary data gathered among relevant stakeholders in 2025. Research participants were very experienced Policy makers, Practitioners and Experts in Nigeria. An exploratory research design was adopted. The study area covered the Federal Capital Territory (FCT), the capital of Nigeria. FCT is the epicentre of policy makers, practitioners and experts relative to the focus of the research. Purposive sampling was adopted to select participants for data collection due to the nature of the research. Semi-structured Key Informant Interview Guide was used to interview the research participants. A total of 11 interviewees were facilitated during data collection. NVivo 15 Qualitative Data Analysis Software was used to analyse that data gathered. Exploratory and explanatory data analysis was done during data processing. Global Best Practices in ethical research were upheld throughout the data collection and processing stages. These included principles of; Informed consent, non-maleficence, beneficence, anonymity, right of withdrawal, justice, non-inducement and non-coercion.

#### Socio-demographic Characteristics of Interviewees

**Table. 1: Socio-demographic information of the respondents**

Variable		Frequency
Gender	Male	6
	Female	5
<b>Total</b>		<b>11</b>
Category	Policy Makers	3
	Practitioner	4
	Expert	4
<b>Total</b>		<b>11</b>



The informant expressed thus:

*When you hear Nigerians who apply for construction work talk, you as the recruiter, will be disheartened. So, I'm going to give us 40% in that aspect. L4S\_Ng\_Exp\_01*

An academic informant asserted in support of describing the curriculum as poor, thus:

*We are having 80 % theory and then maybe 10 or 15% practical. If you see the curriculum, it's beautifully defined, beautifully designed. But it lacks every ingredient that will bring it to fruition. L4S\_Ng\_Expt\_03*

Additionally, curriculum gaps were emphasised by an informant from the employers' association, and he considered the curriculum as outdated, stating:

*It often focuses more on theory than practical skills. The content of the current curriculum that we have mostly doesn't reflect current industry trends, especially in terms of technologies and innovations. The curriculum is not sufficient. Perhaps we can say they are obsolete, they are outdated, and there's a need to improve on the curriculum to review and improve on it to meet the current realities. L4S\_Ng\_Prac\_07*

The poor status of the education curriculum is also supported by an informant from the Ministry of Education who reported that:

*The ministry is working on a policy to ensure students do not just get the formal classroom training but are equipped with skills that will make them employers of Labour and enforce on the job training. L4S\_Ng\_Pol\_05*

As poor curriculum is predominantly highlighted, there is also submission by two informants who believed that the curriculum is still satisfactory or considerably good, one policy maker stated:

*We are turning out graduates now who are employable, it's a good curriculum content if you should ask me. L4S\_Ng\_Pol\_06*

### **Curriculum Strengths**

The strengths identified for the curriculum, especially in polytechnic and monotechnic for the engineering sector, include internship or industrial training. A policymaker praised the engineering sector's efforts:

*We have what we call IT (industrial Training), especially the technical schools in technical schools we have year one and two. So after their first year, when they are on holidays, they give them three months to go for a practical in any of these*

*industries or any of these offices where they are learning. So, it definitely help”*L4S\_Ng\_Pol\_05

Also supported specifically for graduates from technical schools. An informant from the NBTE stated thus:

*The curriculum, like the curricula we have for HND, ND/HND, they have high practical content than theoretical content. So, the curriculum was designed to meet the local demand and the local.* L4S\_Ng\_Prac\_07

Some sectors, particularly health and engineering, benefit from internship opportunities that bridge theory and practice. As one nursing educator explained:

*For us in the Nursing Faculty, that is why we have the internship. So, you bridge the gaps between theory and practice. Some of the things you taught them using simulation, now they're graduates, they have to touch the patients.* L4S\_Ng\_Prac\_09

### **Curriculum Weaknesses**

The major weaknesses considered of the curriculum are the inadequate practical training, lack of hands-on-the-job training, and general focus on certificates rather than skills, especially in engineering and construction, lack of sufficient practical content:

*For the engineers, hum, those ones let me give them 50%, construction 40% because we don't have what it takes in Nigeria, we only do oral, I mean theory aspects. When it comes to practical, the construction we are nowhere to be found when it comes to having the trade test and everything, we are nowhere to be found, yes.* L4S\_Ng\_Expt\_01

This assertion is further supported thus:

*Training and exposure to the practical aspect of on-the-job methodology are not adequate and still growing.* L4S\_Ng\_Prac\_10

There is a lack of hands-on-the-job training, as stated thus:

*We don't have that hand-on-the-job training* L4S\_Ng\_Expt\_01

There is a high emphasis on the certificate rather than skills:

*The major challenge in Nigeria is certificates, certificates, and certificates. No matter how good you are at doing things, if you don't have a certificate, they may not recognise you. L4S\_Ng\_Prac\_07*

### Quality of Graduates

The quality of graduates, especially in construction and engineering, was widely criticised. Low Quality of Graduates is then prevalently shown in the interviews. A university lecturer summarised:

*So, the quality is very, very poor. That's why most of the time, if you go outside the country, you'll be forced to write other professional exams to qualify to work in those countries. L4S\_Ng\_Exp\_03*

Another informant from the employers' association supported that:

*The technical know-how is often not there. In fact, you will be shocked if you take someone to a roadside mechanic and someone who studied mechanical engineering at a university. Give the two of them a car to fix for you, and you will see the difference. The same thing happens when you go to the building sector, you know the same thing in construction, also in health. L4S\_Ng\_Prac\_08*

Even in the health sector, which appears better, there are concerns about the increase in poorly equipped institutions:

*There are more than 20 schools of nursing here and there, and the graduates are usually half-baked. Now, with this kind of graduate, who would want to employ such a person? We have a whole number of, a whole lot of graduates coming out of various schools every year, not just in health. L4S\_Ng\_Expt\_03*

However, another practitioner in the educational sector raised concerns and no clarity on why graduates are not representing what they are being taught in school:

*Well, for me, and with the interactions I've had with a couple of graduates, I think many of them are not really representing what we have taught them. I don't know why. L4S\_Ng\_Prac\_09*

### 6.2.2 Pre-departure Recruitment Training

The interviews then reveal that some training takes place during recruitment before the departure of the migrants from Nigeria. This may be to train them more on some necessary aspects that will be needed to improve their skill and other orientations needed from the new country they are heading to. The supporting excerpts are thus:

*As a recruiter, after sourcing, we bring all the applicants together. We give them training, both theoretical and practical aspects for us to determine if they really meet the demand we are being given by our foreign partners. So anybody that come out successfully in both training will proceed to the final stamping stage. We compile the list of all applicants, then take it back to the Ministry. From there, they schedule an appointment date for all the applicants. We call it pre-departure orientation or pre-departure training. So this is done by the government, labour government officials at the ministry to give them training to orient them to know what to meet at the host country, their dos and don'ts of the host country and other things.” L4S\_Ng\_Expt\_02\_03*

*There will be a pre-departure orientation seminar for intending migrants. L4S\_Ng\_Prac\_08*

### 6.2.3 Need for Integrating Informal Training

The need for integrating informal training is well entrenched in the interviews by the key informants, as they expressed that this type of training would have helped in improving the quality of graduates in the labour force:

*If there is a way of formalising their experience, cumulate their experience and their knowledge... certify them based on these criteria. L4S\_Ng\_Expt\_03*

*The informal sector has this hands-on experience, this is how we do it, and they show them, like this is how it should be done, that's what's missing within our schools. L4S\_Ng\_Prac\_08*

Lack of recognition because of their informality is a constraint preventing this training in our educational system:

*So, because of the informality, the informality of these people, they are not recognised, they are not valid, they should be formalised, they should be certified. They should be given an opportunity to function in the educational system so that learners will be willing to learn from them. L4S\_Ng\_Expt\_03*

The informal sector practitioners are then encouraged to be added to the educational system of Nigeria and incorporated into the curriculum, as this would improve the whole system.

*Put them into the laboratories as lab technologists and prepare them to be practical teachers to these undergraduates. If the curriculum is designed to accommodate this class of people. You will see that the quality of graduates will be more up-skilled and will fit more into a problem-solving approach than this*

*theoretical knowledge acquisition that does not fit into the local system or local society and has no capacity to solve any problem. L4S\_Ng\_Expt\_03*

### 6.3. Labour Market Demand and Supply

There is generally high demand for health, STEM, and construction labour in Nigeria. However, while supply appears sufficient, structural challenges such as policy gaps, inadequate skills training, and high migration rates result in significant labour market mismatches. This contributes to unemployment, even among degree holders, and poses future risks of labour shortages across these key sectors.

An informant expressed with illustration, that Nigerian health workers are in high demand across the globe:

*Nigerians are one of the best-qualified candidates across the globe. Most especially, let's take Saudi Arabia as a case study. Saudi Arabia prefers to hire Nigerian health care workers from caregivers, to nurses, to doctors. Each cadre of each doctor's category, when we talk of the specialist, the registrar, the consultant, they prefer to hire Nigerians than any other African country. L4S\_Ng\_Expt\_02*

Furthermore, to the engineering and construction companies, it is also shown that Nigerian labourers are in high demand:

*Aramco is the best and the largest oil processing company in Saudi Arabia. Almost 75% of their workers are Nigerians, which are our engineers. From our HSC, from our mechanical technicians, from our riggers, our scaffolders, our well-drains, like that, most of them are Nigerians L4S\_Ng\_Expt\_02*

Another informant from a recruitment company stated in support that international partners across Asia, Europe, America, and the Gulf are eager to hire Nigerians due to their skills and manpower:

*So when we discuss with our international partners, they are usually interested in employing Nigerians.*

*Anywhere, both in the Asia country, both in Europe or American countries, both in the Arab country, the Gulf countries, they are always eager to employ Nigerians to work with them because we have the skills and we have the manpower. L4S\_Ng\_Expt\_04*

However, labour supply and skill availability, an adequate supply of labour is also revealed in the interviews. An informant from the recruitment company views that:

*Yes, Nigeria have enough supply of workers. I will say, it is going to increase."L4S\_Ng\_Expt\_02*

### Absence of Transition-to-Employment Policies

There is an absence of transition-to-employment policies, and there is no policy in place to address the youth's unemployment. And this lack of structured pathways contributes significantly to graduate unemployment. Informants unanimously agreed that no formal mechanisms currently exist to facilitate the transition from education to employment in Nigeria. The supporting excerpts are as follows:

*There is policy gaps. There is no policy to absorb their graduates. L4S\_Ng\_Prac\_09*

*So there is no profession for people graduating to now embark on any job employment after graduation. We don't have such a policy in Nigeria. L4S\_Ng\_Expt\_02*

An informant from the employers' association also supported thus:

*I'm not really aware of any. L4S\_Ng\_Prac\_08*

*I'm not really aware of any transition-to-employment policy in Nigeria. We are running a mechanisation policy. So, after NYSC you find your way, you search for a job. L4S\_Ng\_Pol\_06*

### 6.3.1 Skills Deficit among Graduates and Unemployment

The informants further expressed that not enough skills during formal education also leads to unemployment in Nigeria, for it's a sign that some graduates are not employable in the labour market. Having an advanced degree does not make graduates more qualified in this field of study; rather having the necessary training and skills. Many advanced degree holders are unemployed because they lack practical skills, reflecting a disconnect between academic learning and real-world job requirements. The supporting excerpts are thus:

*Because you have advanced degrees without any skills. So that's what's making them unemployed. L4S\_Ng\_Prac\_08*

*The advanced degrees in the countries need to think outside the box to learn the practical aspect of entrepreneurship in order to remain relevant in the system, so that mandatory skills will make them employable. But if you don't have any skills, that's why the, now NBTE mantra is, motto is, skills not degrees. So that is what's made them not employable, because they don't have any skills. L4S\_Ng\_Prac\_07*

### Shortage of personnel because of migration

There is a prominent account of a shortage of personnel because of migration. Several informants highlighted that labour shortages, particularly in health, are already evident due to emigration.

*There is a shortage because they are migrating. So that is why we have the shortage of healthcare workers in Nigeria. L4S\_Ng\_Expt\_02*

*We have more Nigerians going than coming. L4S\_Ng\_Expt\_04*

### **Risk of a shortage of qualified labour**

There is a projection of risk of a shortage of qualified labour. Experts predicted that the situation may worsen in the coming years unless intentional action is taken.

*Yes, migration is high in Nigeria, it will cause a shortage in Nigeria. L4S\_Ng\_Pol\_05*

*I'm not seeing anything changing in the next five years. It may be getting worse if the government is not intentional about addressing the issues that we have identified initially. L4S\_Ng\_Prac\_08*

*If care is not taken, we are going to have a shortage of health care workers in Nigeria very soon. L4S\_Ng\_Expt\_01*

An academic informant observed a shortage in passionate nursing students, noting that many pursue the profession primarily as a pathway to migrate abroad, rather than out of genuine interest or dedication to nursing:

*I see a shortage. And if you ask me, I'll tell you why. Many people are coming into nursing today, not because they love nursing. If I'm correct, this... pardon me, but even when you're teaching them, I see it in them that let me just finish this thing and go to the international community and go. L4S\_Ng\_Prac\_09*

An expert at a federal university believed that there would be a shortage because the graduates do not have the required skills to function effectively in society:

*Like I just said, you keep having a chunk of people graduating from school, who do not have the required skills to function in the various sectors. L4S\_Ng\_Expt\_03*

### **6.3.2 Policy gap in attracting people into health, STEM and construction**

The interviews with the informants predominantly show the absence of policy or financial incentives to encourage students to enter health, STEM, or construction fields. Where such supports once existed, they are no longer in place. The supporting excerpts are as follows:

*I'm not aware of any policy. L4S\_Ng\_Expt\_01*

*Initially, I know that most students who were going into the medical and engineering lines were being sponsored. There were always scholarship funds for these students. That was in the early 2000s. But as of now, I don't know of any such provision. Rather, I know that their school fee is higher than other students, which makes it very difficult to study... The cost of studying those programs in Nigerian universities is overbearing. L4S\_Ng\_Expt\_03*

In support, an informant expressed that incentives are present in another country but not available in Nigeria:

*So some schools have this facility where students, maybe one, you give them scholarships for the rest of the courses. Nigeria does not have many scholarship funds. L4S\_Ng\_Pol\_06*

#### **6.4 Migration of STEM, Health and Construction Personnel (from origin country)**

The migration of skilled workers from Nigeria, particularly in the health, STEM, and construction sectors, continues to be on high increase rapidly (Akanle, 2025). This movement is largely driven by poor working conditions, inadequate remuneration, lack of professional incentives, and the absence of bilateral labour frameworks to support ethical and regulated migration. These identified motivators are also consistent with other related studies that reveal multiple drivers of migration (Akanle, 2024).

##### **6.4.1 Motivation for Migration**

Poor remuneration is a prevalent sub-theme as a motivating factor for labour migration from Nigeria. Personnel consistently seek better opportunities abroad where wages, welfare packages, and professional growth are more attractive (Ojuri and Akanle, 2025).

*What is making people migrate... is low wages, poor employment conditions. Most of them are moving because they are attracted to the living wage being paid overseas. L4S\_Ng\_Pol\_11*

A recruiter provided a vivid comparison:

*You can't compare a nurse who is BSc nursing working in the US, collecting a salary of \$12,000 per month, with working in Nigeria and collecting 40,000, 50,000, 60,000. L4S\_Ng\_Expt\_02*

Similarly, the disparity in working conditions and benefits was emphasised:

*I cannot see a situation whereby I will be earning more and I will decide to stay where I will be earning less. Low wages and ermm low wages, pension and their access to certain things. Like now, I'm recruiting optometrists to Saudi Arabia, they are offering them a salary not less than #2 million, while they are in Nigeria, they are paying them one hundred and something. The highest-paid Optometrist earns #250,000. They are not paying for accommodation, feeding, they provide them transportation, and they are living comfortably over there... they can bring their family. L4S\_Ng\_Expt\_01*

In addition to salary differentials, the interviews also reveal that poor working conditions, lack of equipment, and unfavourable work environments are part of the reasons that motivate workers to migrate:

*We are humans, the conducive working environment. One, the remuneration, two, the tools and equipment to work, three, no matter how good you are, if you don't have the right tools and equipment to work with, all that your talent will drain. L4S\_Ng\_Prac\_01*

Broader socio-economic challenges further drive migration:

*...graduates leave this country every year in those areas. The problem is that the country is not paying well. There's a high level of insecurity. There is no opportunity for employment based on merit. Corruption is fighting everything, and Sentiment is taking over the grounds. There is no hope of a better tomorrow. People prefer to raise their children in Europe and America... There's no future here. L4S\_Ng\_Expt\_03*

An expert at the Federal University shed more light on how workers are motivated to migrate:

*Greener pasture, better working environment, international recognition, and better wages. I mean, you go there, you're paid per hour and you calculate what you're being paid, translate to huge. Number two, the instability of our economy in Nigeria. For example, you talked about the exchange rate that is also fluctuating. So, you feel if you go there, you work for one or two years, you come back to Nigeria, it's to invest or you have money to do this and that. L4S\_Ng\_Prac\_09*

#### **6.4.2 Lack of Bilateral Labour Agreements (BLAs) and MOUs**

The lack of formal bilateral labour agreements (BLAs) or memoranda of understanding (MOUs) between Nigeria and destination countries significantly limits Nigeria's ability to protect migrant workers and manage outflows effectively. The interviews prevalently reveal a lack of MOU and BLA, as it is shown thus:

*No bilateral agreements for... No bilateral agreements for any Nigerian workers with any country. L4S\_Ng\_Expt\_02*

*I'm not aware of any other bilateral agreement signed by Nigeria and any other nation. I'm not aware. L4S\_Ng\_Prac\_08*

In support, a policymaker critiqued the implications of poor foreign policy alignment:

*Incidentally, is where our foreign policy has a big problem, and I blame Buhari because I never forget when the German Chancellor came to Nigeria, the first thing he said was they can deport Nigerians back, meaning, who says that? Who does that? So our BTAs, our bilateral trade agreements, do not include the movement of human beings. It only includes goods and services. Every country's BTA includes this, I don't know why Nigeria's doesn't. L4S\_Ng\_Pol\_06*

However, according to policy maker from the federal ministry of labour expressed that there is an existing policy framework with the potential to address this gap:

*The federal migration labour has a policy called the National Policy on Labour Migration with three main objectives: promoting good governance of labour migration in Nigeria, protection of the rights and welfare of Nigerian migrant workers and then mitigating the adverse effects of labour migration and harmonizing the benefit of international labour migration for national development. So the labour migration policy is an overarching framework for promoting regular pathways of immigration from Nigeria to other parts of the world. And the policy clearly stated that Nigeria should identify countries where we have large numbers of Nigerian migrants and enter into a bilateral labour agreement or a memorandum of understanding. L4S\_Ng\_Pol\_11*

#### **6.4.3 Lack of Policy or Incentive to Avoid Brain Drain**

The interviews prevalently show that there is no policy or incentive program to retain or reduce migration of health, STEM and construction workers from leaving the country. The following are the supporting excerpts:

*No, I don't know of that, there is no policy as relates to graduates. L4S\_Ng\_Pol\_05*

*There are no visible policies to address it as we speak. L4S\_Ng\_Expt\_03*

Another informant expressed that even the implementation of basic measures, such as a minimum wage, was cited as unfulfilled:

*I am not aware. I'm not aware because even minimum wage has not been implemented. L4S\_Ng\_Pol\_06*

## 6.5 Conclusion

This report highlights critical insights into the state of training, labour market dynamics, and migration patterns in Nigeria's health, STEM, and construction sectors. While Nigeria possesses a significant pool of human capital, persistent challenges in curriculum relevance, practical skills training, and the absence of transition-to-employment policies weaken workforce preparedness. The result is a widening gap between educational outcomes and labour market needs, especially in the construction and engineering fields. Similarly, Ajuzieogu (2025) found that Nigeria faces both genuine skill shortages in new technologies and essential industries, as well as deep-rooted labour market inefficiencies that cannot be solved merely through training initiatives.

The imbalance between demand and supply is further worsened by mass migration (Ojuri & Akanle, 2025; Akanle, 2025; Adegbami & Osungboye, 2024). Skilled professionals, particularly in the health sector, are leaving the country due to poor remuneration, inadequate working conditions, and a lack of incentives or career support, and these trends point towards brain drain.

Efforts to enter bilateral labour agreements and establish regulated migration channels remain minimal. Despite the existence of the National Policy on Labour Migration, there is no evidence of effective bilateral agreements being implemented to protect migrant workers or manage flows in a way that benefits all parties involved. Thus, Nigeria is yet to realise a 'triple win' scenario where the migrant, the origin country, and the destination country all benefit equitably.

The discrepancy between labour shortage claims by international actors and surplus perceptions among local institutions reflects a serious coordination failure. Without shared data systems, policy alignment, and ethical recruitment frameworks, the risk persists that migration will remain exploitative, favouring destination countries at the expense of Nigeria's national development.

## 6.6 Recommendations

The study findings reveal various recommendations, which include curriculum review, training, good remuneration, provision of MOU & BLA, and career path orientation.

- **Curriculum Review:** It is vital to adapt educational curricula at all levels to reflect current industrial trends, including local challenges, and balance theory with hands-on practice. A practical curriculum is required to properly prepare graduates for the realities of the labour market.

*There's a need for the curriculum to be reviewed and updated as the industry trends, the industry trends change almost if not every year, every three years. And as things are changing,*

*there's a need to also review our plan to accommodate these changes that we see. L4S\_Ng\_Prac\_08 & L4S\_Ng\_Pol\_05*

- Training: The interviews also reveal the need for training in form of skill acquisition, and internships are recommended.
- To close the labour market skills gap, the government should invest heavily in technical and vocational education and training (TVET), internships, and structured on-the-job learning. This is important as vocational education is emphasised to promote Nigerian economic growth (Ajeniwani, Bamgbowu, & Obasi, 2024). The informal skill acquisition centres and their operators should be integrated into formal education systems as practical mentors and trainers, especially in engineering and construction sectors.

*There's a need to emphasise internships because it's a real thing for both the interns and the company. L4S\_Ng\_Prac\_08*

*The only thing that we are shouting, advocating and enlightening people to, is please let's have skills, skills and skills. As long as you have skills, now in the UK and Canada, they are scouting for our people. Even if you are going to the formal system, please make sure you attach your formal degree with skills. L4S\_Ng\_Prac\_07*

- Good Remuneration of Personnel: Poor salaries and working conditions are key drivers of migration (Ambali, Alabi, Salahu, & Ogunsola, 2025; Akanle, 2024; Ipole, 2018). This study then recommends that the government should implement competitive salary structures, hazard allowances, and improved workplace conditions to retain skilled professionals. Good remuneration for the personnel is recommended to attract and aid in retaining labour in the sector. The supporting excerpts are as follows:

*Nigeria should just start thinking of doubling the salaries of health workers. ...multiplying by 100%or 200%. L4S\_Ng\_Prac\_09*

*The government should also increase the people's pay or salaries, and all these will reduce migration. L4S\_Ng\_Pol\_05*

*Create environments, pay people well. L4S\_Ng\_Pol\_06*

- Provision of MOU & BLA: To ensure ethical, fair, and beneficial migration for Nigeria's skilled workers, the federal government should make provision and urgently negotiate and implement bilateral labour agreements with key destination countries. These agreements should protect migrant workers' rights, guarantee decent work conditions, and promote fair recruitment.

*My recommendations to the government will be that we should try and work on our MOU or BLA with countries, so that we can be able to have access to free recruitment and our nationals can have a lot of benefits like other nationals. L4S\_Ng\_Expt\_01*

*What we need is policies and then implementation. L4S\_Ng\_Expt\_04*

- Develop Transition-to-Employment and Career Guidance Policies: The current absence of policies to support graduates' transition into the workforce contributes to high unemployment. The federal and state governments should introduce career orientation programmes, post-graduation support services, and structured internship-to-employment pathways to bridge this gap in order to aid transition to employment.

## REFERENCES

- Adegbami, A., & Osungboye, B. M. (2024). Governance and Mass Migration Of Nigerians Abroad: The Causes and Consequences. *Journal of Governance and Administrative Reform*, 5(1), 209-228.
- Ajeniweni, P. O., Bamgbowu, S. A., & Obasi, I. O. (2024). The role of vocational education in promoting economic growth in Nigeria. *Journal of Economics and Environmental Education (JEEE)*, 8(1), 23-41.
- Ajuzieogu, Uchechukwu. (2025). Nigeria's Skills Gap: Beyond the Rhetoric. A Comprehensive Analysis of Labor Market Dynamics in Africa's Most Populous Nation. 10.13140/RG.2.2.16363.60966.
- Akanle, O. 2025. What are the Social Costs of International Migration? Narratives of Lived Realities from Nigerian Migrants, their Kinship and Social Networks. *African Renaissance*. 22.3. Pp. 305-330.
- Akanle, O. (2024). Background country report on Nigeria within the migration system of West Africa. *MEMO complex migration flows and multiple drivers in comparative perspective the MEMO research partnership is led by: Toronto Metropolitan University (TMU) Canada Excellence Research Chair in Migration and Integration. Supported by Social Sciences and Humanities Research Council of Canada.*
- Ambali, A., Alabi, A., Salahu, M. O., & OGUNSOLA, A. O. (2025). Exploring the Push and Pull Factors of Skilled Youth Emigration in Nigeria. *International Journal of Intellectual Discourse*, 8(2).
- Ipole, P. A. (2018). Labour migration among skilled workers: A Sociological analysis of existing working conditions in Nigeria. *IOSR Journal of humanities and social science*, 7(8), 35-42.
- Ojuri, A.T. & Akanle, O. (2025). Understanding the Why and How of Left-behind Spouses of International Migrants in Nigeria. *African Journal for the Psychological Studies of Social Issues*. 28.1. Pp. 85 – 103.

## 7.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – PHILIPPINES

Authors: Maria Andrea Soco Roda, Maruja M.B. Asis, Geoffrey M. Ducanes (Scalabrini Migration Center)

### 7.1 Introduction

Philippine’s education is characterized by a mainly private institution-led provision of academic qualifications; a licensure system regulating professional practice; the requirement of undergraduate degrees for fields such as medicine and law; a separate General Education program for higher education; and a quality assurance system involving both public and private bodies<sup>49</sup>.

In 2013, Republic Act 10533, or the Enhanced Basic Education Act, mandated an integrated curriculum for basic and tertiary education. Under this act, basic education was amended to a K-12 system. This system made Kindergarten a compulsory entry point for children at five years of age. It also added Grades 11 and 12, extending high school to two more years<sup>50</sup>. This revised GEC<sup>51</sup> was launched in Academic Year (AY) 2018-2019, which also saw its first batch of Grade 12 students. The Commission on Higher Education notes that the GEC was developed to produce graduates with skills and competencies fit for the current needs of industry. Concomitantly, the revised GEC also pushed for a shift from an “inputs-and knowledge-based education and training approach to a learning outcomes-based approach”<sup>52</sup> that highlights knowledge, skills, and competencies.

Under the K-12 system, the senior high school (grades 11 and 12) curriculum includes 4 tracks: Students who opt for the i) Academic track would be streamed into STEM, Humanities, or Business, depending on their specific choice. The ii) Arts and Design and iii) Sports tracks prepare students for entry into the theatre, music, visual arts, or sports industries; and iv) Technical-Vocation-Livelihood (TVL) track provides students with competencies and skills to be qualified and employable in specific trades and occupations right after graduation. Both public and private senior high school institutions can choose which among the tracks to offer based on the availability of resources and instructors, student demand, and the perceived needs of industry and community.

In the first quarter of 2025, the Department of Education, which oversees basic education, drafted a revised senior high school curriculum that reduces the number of core subjects; merges the tracks into two: i) Academic, which includes arts and design, and ii) Technical Professional (TechPro), which is the TVL strand; and allows students greater flexibility in choosing electives.<sup>53</sup> This revised curriculum was intended to be piloted in AY 2025-2026.

<sup>49</sup> <https://pqf.gov.ph/Home/Details/16>

<sup>50</sup> Prior to the K-12 system, children undergo 6 years of elementary education (7 years in a number of private institutions); 4 years of high school; and 4 years of tertiary education.

<sup>51</sup> Titled “Holistic Understandings, Intellectual and Civic Competencies.”

<sup>52</sup> <https://pqf.gov.ph/Home/Details/16>

<sup>53</sup> <https://www.philstar.com/headlines/2025/04/07/2434201/no-more-strands-deped-opens-new-draft-senior-high-curriculum-feedback>

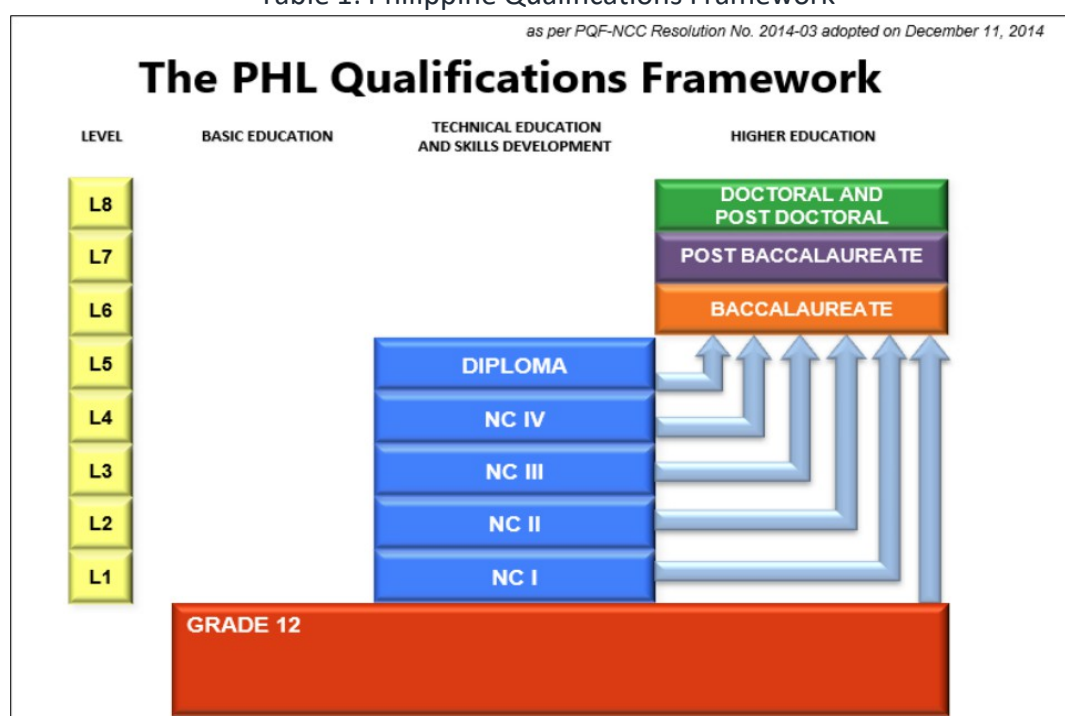
## 7.2 Training and Education in the Philippines

The framework for skills training and education in the Philippines is largely overseen by three government agencies: i) the Department of Education (DepEd) for basic education; ii) the Commission on Higher Education (CHED), for tertiary education; and iii) the Technical Education and Skills Development Authority (TESDA), for technical and vocational education.

The DepED, CHED, and TESDA, together with the Department of Labor and Employment (DOLE) and the Professional Regulations Commission (PRC), comprise the PQF National Coordinating Council (PQFNCC). This council supervises the Philippine Qualifications Framework (PQF), which “sets the standards for qualification outcomes<sup>54</sup>.” The PQF lays out national standards and learning outcomes, which are also aligned with the international qualifications framework in order for domestic qualifications to be recognized abroad<sup>55</sup>.

Under the PQF, there are eight levels of qualifications after Senior High School (Grade 12), which are illustrated in Table 1 below.

Table 1: Philippine Qualifications Framework



Source: ASEAN Qualifications Reference Framework Referencing Report of the Philippines. 22 May 2019, p. 5.

<sup>54</sup> <https://pqf.gov.ph/Home/Details/3>.

<sup>55</sup> Ibid.

### 7.2.1 Technical and Vocational Education and Training

TESDA handles the qualifications and certifications from Levels 1 to 5 (National Certificates I to IV) and certain Diploma<sup>56</sup> courses.

Part of TESDA's mandate is to craft the National Technical and Skills Development Plan (NTSDP), reviewed every 6 years at the start of a new administration, to align with the Philippine Development Plan of the National Economic and Development Authority (NEDA) and the Labor and Employment Plan of DOLE. The NTSDP serves to guide TESDA in the preparation of "middle level manpower"<sup>57</sup> in response to the Philippines' development goals and priorities and in line with creating a skilled workforce.

To ensure that the TVET qualifications are practical and respond to the needs of industry, TESDA has implemented an Area-Based and Demand Driven (ABDD) approach, which determines not only the TVL courses offered at the national and local levels but also the priorities for scholarships and training subsidies. Under this framework, skills mapping and prioritization are conducted at both the national and district level. The skills required and labour market information for each sector are validated through surveys, focus-group discussions, and industry consultations.

The plethora of skills get filtered through these industry consultations, FGDs, and surveys.

We have this skills mapping survey tool or instrument to determine which skills are urgently needed and which have the highest shortage. We process the results and determine what program to be developed as a training regulation or competency standard. Through the skills mapping, we also determine which programs need to be reviewed, what are outdated because of new technologies or practices within the industry or within certain occupations<sup>58</sup>

Further, TESDA has initiated a 'granularized priorities' system. This is done at the local district levels and entails obtaining information on specific tasks that occupational roles require to be more finely attuned to the particular needs of areas or regions. In the granularized priorities system, local field offices can develop competency standards for TVET programs in their area to more quickly respond to industry requirements. Both the ABDD and granularization intend to provide a workforce for local industries. With the skills mapping done even at the local levels, TESDA is able to obtain an estimate of the number of workers required in that particular area.

*If the skills mapping and industry consultations show that, for instance, in baking, 500 graduates are needed this year, TESDA has to produce that number for the year in all the schools that carry baking programs. So that when the 500 graduate, there is an available workforce for the area.<sup>59</sup>*

<sup>56</sup> Diploma courses can also be part of higher education, the qualifications of which would be awarded by public or private Higher Education Institutions (HEIs). Other government bodies that award qualifications include MARINA for seafarers; CAAP for civil aviation personnel, and the PRC, that administers licensure exams for professionals.

<sup>57</sup> Interview with TESDA officials, 25 June 2025. In the current educational framework, "middle level" applies to

<sup>58</sup> Interview with TESDA officials, 25 June 2025.

<sup>59</sup> Interview with TESDA officials, 25 June 2025.

However, TESDA cannot guarantee that the graduates will indeed stay in the region and fill the demand. As TESDA recognizes prior learning, a number of the certifications awarded are to students who no longer need to take the course. These students are often already working in industry or abroad and only need to get certified for a particular skill. There is also currently no requirement for TVET graduates to remain in their localities, and some do move to other regions or go overseas.

### **Higher Education**

In responding to the labour and skills requirements of the country, CHED partners with other government agencies and the private sector. One collaboration is with the Philippine Business for Education (PBE), a non-government organization that proposed to conduct a “parallel review” of CHED’s curriculum in the fields of Management Information Technology (IT), Hotel and Restaurant Management (HRM), and Electronics Engineering. To push for increased industry involvement “in the areas of curriculum design, faculty development, and quality assurance” and to “define relevant competencies which will be presented to the CHED,”<sup>60</sup> PBE has organized industry groups in the sectors of management, IT, tourism, semi-conductors, and manufacturing to participate in the parallel review. Further, PBE has also initiated the Higher Education Productivity Project (HEPP) with funding from the USAID. This project intends to create industry-academe linkages at the national and regional levels to minimize the skills gap and mismatch.

Higher Education Institutions (HEIs) also engage with firms and industries under Cooperation Agreements<sup>61</sup>.

There are linkages between the academe and industry particularly when it comes to On the Job Training (OJT) for graduating students whose curricular programs require it. CHED notes that firms often hire students who have done OJTs with them. Linkages with industry for On the Job Training not only provide employment options for graduating students, who would have gained experience and connections in their OJT, but could also stave off skills shortage as employers have a steady pool of students they can train and potentially absorb. Industry immersion has, in fact, become a common practice among HEIs to enable students to “gain practical experience in a real-world work environment relevant to their respective fields of study.

This hands-on experience complements theoretical knowledge gained in the classroom, providing students with valuable insights into industry practices, culture, and expectations.”<sup>62</sup>

If HEIs continue to expand industry immersions, student preference for skills-based learning<sup>63</sup> can be satisfied. As an Instructure (2023)<sup>64</sup> study finds, student-respondents were inclined to pursue apprenticeships and certificate programs mainly for career advancement and career readiness.

<sup>60</sup> Data obtained from CHED representatives. 16-20 June 2025.

<sup>61</sup> These are either MOUs or MOAs with other government agencies, the private sector, or foreign governments and institutions.

<sup>62</sup> Data obtained from CHED representatives. 16-20 June 2025.

<sup>63</sup> Instructure (2023) The State of Student Success and Engagement in Higher Education.

<sup>64</sup> Ibid.

### ***Strengths and Weaknesses of the Curricula***

Despite efforts from these government bodies to address the needs of industry and minimize skills mismatch, education and training in the Philippines remain hounded by i) low passing rates in proficiency exams, and ii) an inadequate performance in what are called “foundational skills” which are indicative of work-readiness.

DOLE, with private sector firm, Servicio Filipino, Inc., conducted a study to profile the 21st century skills of the Philippine labour force (see OECD/ADB, 2017<sup>65</sup>). The study involved assessing the competencies of study participants and identifying the strengths and weaknesses of students, trainees, and the workforce. Results show that participants performed strongly in English and Math functional skills, workplace ethics, English comprehension, and multitasking; but needed improvement in “teamwork, decision-making, innovation, planning and organizing, and creative problem solving.”<sup>66</sup> Similarly, in the 2022 Programme for International Student Assessment (PISA) taken by 15-year-olds<sup>67</sup>, the Philippines scored a mean of 14, which places the country among the five lowest performing countries.

Creative thinking as a skill and an outcome can be developed as these students move into higher education or TVET. These skills, considered soft skills<sup>68</sup>, foundational skills, or critical core skills, are recognized by the education and labour sectors in the country. The shift to an outcomes-based approach in both basic and higher education, and the online courses offered by TESDA on 21st century skills, reflect the necessity of shaping a workforce that can face the demands of the 21st century (see Bernardo et al, 2023).<sup>69</sup> As DOLE Director Patriwirawan mentions, these skills are important for industry stakeholders because “they play a crucial role in improving employability and workplace productivity.”<sup>70</sup> While many of the vacancies and hard-to-fill positions in, for instance, STEM, health, and management, require high technical proficiency, the idea of proficiency might also entail strong foundational skills, which can also facilitate transfers especially for labour market re-entrants or older workforce. Much remains to be done, however, for the education and training sectors in the country to go beyond the “administration of training and skills...largely geared towards the pre-digital era.”<sup>71</sup> In the World Digital Competitiveness ranking in 2024<sup>72</sup>, the Philippines ranked 61st out of 67 global economies overall. In the knowledge category, which includes higher education achievement, the Philippines ranked 64th. While the WDC rankings include digital infrastructure, a large part also

<sup>65</sup> OECD/ADB (2017) Employment and Skills Strategies in the Philippines, OECD Reviews on Local Job Creation, OECD Publishing, Paris.<http://dx.doi.org/10.1787/9789264273436-en>

<sup>66</sup> <https://www.pids.gov.ph/details/intensify-labor-market-educ-to-future-proof-ph-workforce-gov-t-exec>

<sup>67</sup> Refer to [https://www.oecd.org/en/publications/pisa-2022-results-volume-iii\\_765ee8c2-en/full-report.html](https://www.oecd.org/en/publications/pisa-2022-results-volume-iii_765ee8c2-en/full-report.html)

<sup>68</sup> See also Briones, G., E. Apat, D. Lorica, and M. Valenzuela (2021) “Employers’ Preference on Employability Skills of Business Management and Accounting Graduates,” *International Journal of Academe and Industry Research*, 2(3):64-85. DOI:10.53378/348730.

<sup>69</sup> Bernardo, Allan, J. Albert, J. Vizmanos, and M. Munoz (2023) *Towards Measuring Soft Skills for Youth Development: A Scoping Study*, Philippine Institute for Development Studies Discussion Paper Series No. 2023-28.

<sup>70</sup> <https://business.inquirer.net/529374/hard-truth-many-filipino-job-seekers-lack-soft-skills>

<sup>71</sup> <https://www.pids.gov.ph/details/news/press-releases/current-filipino-workforce-often-lack-soft-skills-to-adapt-to-digital-age-pids-study>

<sup>72</sup> <https://imd.widen.net/content/mogzjjgs5d/pdf/2024-Digital-Country-profile-Philippines.pdf>

pertains to the readiness and capacity of students, the workforce, and industries to innovate and adapt to a digital world.

The low passing rate in proficiency exams is another concern that could lead to an undersupply of skills, especially in the technical, professional, and/or hard-to-fill positions. The passing rate for nurses in the May 2025 licensure exams was 64.4%<sup>73</sup>. This might seem adequate but if nurse out-migration is considered, the country will experience a shortage, not only of qualified nurses but of nurses in general. Similarly, the passing rate for licensure exams for physicians and engineers (in various branches) is at around 40-50%. While this can indicate the rigor of the exams, it also points to the need to boost training and skills preparation for STEM professions.

### ***Standardization and alignment concerns***

Concerns over the alignment of course offerings in TESDA programs and in the senior high school curriculum have been raised in the past. The Second Congressional Commission on Education (EDCOM2) report shows that most of the TESDA graduates complete National Certificate I-II programs, which are also offered in senior high school (SHS). Likewise, a number of Training Regulations (TRs) are found to be “outdated, and industry involvement in curriculum development and financing innovation ... remains limited.”<sup>74</sup>

EDCOM2 has suggested an overhaul of TESDA’s charter to enable it to better meet the requirements of the 21st-century labour market. TESDA notes that there has been an initiative in the previous administration to align senior high school TVL offerings with ABDD, which is TESDA’s core strategy - to offer courses and produce graduates based on the demand of areas, of government, and of industries. TESDA mentions that industries appreciate and support the current TVL track for senior high school, “their one comment was ... [that they hope] the courses offered in DepEd schools are NC and up.”<sup>75</sup> This implies the assumption that senior high school TVL programs may not yet be at the level of a National Certificate, which is what TESDA programs provide.

With the recent creation of the cabinet cluster for education, TESDA hopes that there will be greater alignment between TESDA and the DepED, and that the senior high school curriculum be area-based as well. But even with an area-based approach, certain TVL programs in senior high school, such as in manufacturing, require significant investment in tools and machines. Many schools are unable to invest and as such, cannot offer corresponding courses despite industry demand. Further, if few students choose tracks that are in high demand by industries, the tendency would still be for schools to offer the more popular choices. An examination of how the SHS tracks match the needs of local jobs and industries in Cebu finds a mismatch between TVL strands and in-demand and projected in-demand jobs (Pajares et al, 2018)<sup>76</sup>. It maintains that SHS programs were not designed according to the needs and demands of the locality but on student preferences. Courses offered were based on

<sup>73</sup> To follow: data on how nurses in GSP programs have fared in nursing exams.

<sup>74</sup> <https://edcom2.gov.ph/tesda-charter-needs-overhaul-to-meet-demands-of-21st-century-workforce/>

<sup>75</sup> Interview with TESDA officials, 25 June 2025.

<sup>76</sup> Pajares, G., M. Yadao, M. Bongcales, and J. Avenido (2018) “The Sectoral and Skills Mismatch between the Senior High School Program and the Top In-Demand Jobs and Projected In-demand Jobs in the Province of Cebu & Philippines,” *Researchers World – Journal of Arts Science & Commerce*, DOI: 10.18843/rwjasc/v9i2/24.

what students wanted to take. As such, SHS graduates were not readily employable given the employment demands of the districts (ibid). Close coordination among stakeholders was recommended to address the skills gap.

### 7.3 Training and Education in STEM, Health and Construction

The bilateral agreements for nurse training can fill the skills gap, given a fluctuating passing rate in nursing licensure exams that averages 60%. In these agreements, nursing schools obtain knowledge and technology from foreign partners, which should raise the level of training received. CHED has also partnered with the Department of Health (DOH) and the Private Sector Advisory Council (PSAC) in July 2023 to re-skill and upskill nurses. An example of such a partnership is the tapping of HEIs with a good track record to provide review classes.

TESDA, on the other hand, notes that National Certificates for health-caregiving, in particular, are highly valued and recognized abroad.

When we were [developing a course on caregiving]... we had the Caregiving Society of the Philippines as our subject matter. It is an association but they really encourage their members to take the course. So I think, even if taking TESDA courses [and getting certified] may not be a requirement of employers, associations advocate for TESDA courses.<sup>77</sup>

Many of those who take caregiving courses, however, are either returning from abroad to upgrade their skills and get certified, or about to migrate.

Caregiving is a Training Regulation (TR) which results in a National Certificate II. What was originally just one course has now been broken down into Caregiving-newborn, grade-schooler, elderly, and special needs. Overseas Filipino Workers who previously held the NC2 for caregiving will now be required to choose a “specialty” when they renew their certifications, although at the moment, the current NC2 still holds. Enrolment for the different caregiving specialisations is modest but a majority of those enrolled are in elderly care. In 2024, the completion rate for those enrolled in TESDA health and healthcare-related courses was at 89%, with 73,258 graduates among the 82,210 enrolled.

There is also significant enrolment in a number of TESDA programs in construction, despite the general stereotyping of construction jobs as dirty, dangerous, and difficult. Industry consultations, in fact, reveal difficulties in getting students to enrol in construction tracks because of this stereotype. TESDA notes that while there are many programs for construction that are popular, for instance, carpentry, painting, masonry, and heavy equipment operation and servicing, a number are also unutilized. But the rate of certifications for construction is high, at 96.41% in 2024. Under a system that recognizes prior learning, the number of those assessed in construction as of 2024 was greater than the number of those who enrolled and graduated, with the assessed at 106,000 and the graduates of the programs at 73,000 (from 78,000 enrolled students). The difference is made up of those who were not required to undergo training given their prior learning and could go directly to the assessment for a National Certificate.

<sup>77</sup> Interview with TESDA officials, 25 June 2025.

While TESDA does not classify specific courses as STEM, high completion rates - 80% to more than 90% - can be seen in courses with STEM elements such as agriculture, automotive and land transportation, chemicals, electrical and electronics, heating and ventilation, ICT, metals and engineering, and utilities<sup>78</sup>. Among these courses, the highest enrolment can be seen in metals and engineering, ICT, healthcare, electrical and electronics, automotive, and agriculture. These courses registered more than 200,000 enrollees in 2024, with agriculture having 1.1M enrollees.

With regard to STEM training in basic and higher education, the Department of Science and Technology (DOST) recently signed a Memorandum of Understanding with DepEd to enhance the STEM curriculum and improve scientific literacy. As previously discussed, the quality of STEM training in basic (SHS) and higher education is perhaps reflected in the low pass rates for licensure exams. In the 2019 Trends in International Mathematics and Science (TIMSS) study among 4th grade students, the Philippines ranked last in science and math among 58 participating countries. In addition to what has been mentioned earlier, the 2018 PISA results show that more than 80% of Filipino students “failed to achieve the required level of reading competence.”<sup>79</sup>

To encourage Filipino youth to take up science and technology courses and to sustain human capital, the DOST-Science Education Institute provides scholarships for students to pursue science and technology courses in higher education. There are currently 130,998 DOST scholars nationwide, with 117,320 taking a Bachelor’s degree; 11,007 doing a Master’s degree; and 2,671 in PhD programs. There are also 432 students studying overseas on DOST-SEI scholarships. Likewise, courses in Science and Math; Information Technology Education; and Engineering and Technology are also among the top national priority programs for the CHED Merit Scholarships in 2024-2025.

This means that the scholarships allotted will be for graduating SHS students who will take up courses in the national priority programs, which have been determined in collaboration with DOLE, DOST, and TESDA, among others. There are also regional priority programs based on the labour market needs of specific regions.

While CHED scholarships are non-binding, DOST scholars are mandated to render service in the Philippines in their area of expertise after completing their degree. Under a Return Service Agreement (RSA), scholars serve the country for the number of years in which they were on the DOST scholarship to ensure that the country can utilize their skills.

Should they decide to work overseas, they are required to pay back the financial support they have received in its entirety, including a one-time 12% interest, before they can leave the country. However, there are still a number of scholars who decide to pursue work overseas<sup>80</sup> instead of rendering service in the country, with higher pay being one of the reasons for the decision to migrate.

---

<sup>78</sup> Water supply, sewage, waste management.

<sup>79</sup> De La Cruz, Robert John D. (2022) “Science Education in the Philippines,” in R. Huang et al. (eds.), *Science Education in Countries Along the Belt & Road: Lecture Notes in Educational Technology*, Springer Nature Singapore Pte Ltd. [https://doi.org/10.1007/978-981-16-6955-2\\_20](https://doi.org/10.1007/978-981-16-6955-2_20)

<sup>80</sup> Narratives to follow.

## 7.4 Labor Market Demand and Supply

The Philippines has one of the highest percentages of youth Not in Education, Employment, or Training (NEET)<sup>81</sup>. While TESDA data show that most of their graduates are employed (8 out of 10), there could be a mismatch when many young people are unable to find jobs in regular and entry-level positions despite the vacancies. This also perhaps hints at the need to raise awareness and access to TVET programs and scholarships among underserved communities.

Higher education is also characterized by a slow school-to-work transition, with 65% of graduates unable to get jobs in their sector of choice (refer to Dacuycuy et al, 2023)<sup>82</sup>. There has also been an increase in the number of the educated unemployed, from 1.057M in 2024 to 1.22M in 2025<sup>83</sup>. These are individuals with a high school or higher education degree. DOLE maintains that those with higher education degrees tend to demand higher wages and will wait until better job offers come along, making them unemployed in the meantime. Another reason is the possible mismatch of the program they completed with the current demands of the market<sup>84</sup>. This mismatch is also taking place among SHS graduates.

The goal of the shift to a K-12 learning system in basic education was to make senior high school graduates more employable, especially with the implementation of TVL tracks in SHS.

A study of the pioneering graduates of SHS in Butuan City shows, however, a degree of mismatch between their TVL specializations and the jobs they landed, with agri-fishery and industrial arts graduates both posting the highest mismatch at 68% (Autentico and Alerta, 2020)<sup>85</sup>. With the growth of the retail industry in Butuan, many of the SHS graduates found work in malls - they may be employed but they have not been using their specializations. The study echoes the need for SHS tracks to be aligned with the needs of industries in the region, rather than simply attuned to the preferences of students. Further, the study suggests that having a National Certification on a competency-based assessment from TESDA increases the chances of students landing a job aligned with their specialization (ibid).

Many of the graduates of TESDA courses in 2023 are service and sales workers, clerical and support workers, truck and related trades workers, and skilled agricultural workers. Among those who have taken up TVET in agriculture are farm owners - those running their own farms - who need the competency and certification. TVET students' preference for training in the fast-growing sectors of

<sup>81</sup> Orbeta, A., J.P. Corpus, and N. Araos (2021) "Who are the Youth NEET in the Philippines Today?," Philippine Institute for Development Studies Discussion Paper Series No. 2021-21.

<sup>82</sup> Dacuycuy, C., M. Epetia, A. Vargas, J. Ocbina (2023) "Inputs to the Philippine Labor Market Information System," Philippine Institute for Development Studies Discussion Paper Series No. 2024-06. [assets/premium-content/philippines-nationalemployability-report-2017-en.pdf](#)

<sup>83</sup> <https://www.pna.gov.ph/articles/1258445>

<sup>84</sup> <https://www.philstar.com/headlines/2019/01/02/1881616/dole-most-unemployed-are-educated>

<sup>85</sup> Autentico, J. and G. Alerta (2020) "Incidence of Job Mismatch among TVL Graduates in Butuan City, Philippines," PEOPLE: International Journal of Social Sciences, 6(2), 164-176. DOI- <https://doi.org/10.20319/pijss.2020.62.164176>

tourism and agriculture might create a pool of workers for these industries but also a persistent need in other sectors.

In the long term, the World Bank<sup>86</sup> finds that the fastest-growing sectors are those in technology, such as IT, finance, and AI, as well as construction. The fourth industrial revolution is seen to change labor markets needs towards AI, automation, machine learning, and digital jobs. However, the World Bank notes that the Philippines still has a long way to go when it comes to adapting to global megatrends: the quality of education remains poor, as reflected in test scores and proficiency; the tertiary sector is experiencing slow expansion; and skills for life-long learning and global mobility are not prioritized (World Bank, 2023).

In some predominantly agricultural areas, labour is transitioning out of agriculture and into the services sector. In an interview, DOLE representatives have also recognized the shift in employment patterns in traditional agriculture<sup>87</sup> and mention the digital economy, green energy, and IT-BPM as emerging sectors.

#### 7.4.1 Demand and Supply in STEM, Health and Construction

While the overall employment rate in the Philippines is high, at 96.1%, there is significant underemployment, at 13.4%, with many workers in low-paying elementary occupations.

Healthcare is the sector with the most number of job vacancies, particularly in hard-to-fill positions. This could be due to a low passing rate for board takers and the outmigration of healthcare workers<sup>88</sup>. In 2021, the physicians per population ratio was at 7.92 physicians per 10,000 population, which is compounded by a shortage of 127,000 nurses.<sup>89</sup> A study on the implementation of Universal Health Coverage in the Philippines suggests that scholarships and return service agreements have the potential to address the shortage of health workers in the Philippines (Pepito et al, 2025) so long as graduates are guaranteed job placements.<sup>90</sup> With many health positions besieged by low salaries and poor employment conditions such as long hours and heavy workloads, nurses, for instance, opt to change professions or leave the country instead (Alibudbud, 2023). For similar reasons, a number of DOST scholars have chosen to pay for their scholarships and seek work overseas.

Given the demand for Filipino nurses abroad, the out-migration of nurses comes as no surprise. The nursing shortage is expected to soar to 250,000 by 2030<sup>91</sup> and according to the Department of Health, it will take 12 years to close this gap and 23 years to fill the shortage of physicians<sup>92</sup>. An educator

<sup>86</sup> The World Bank (2023) Philippine Jobs Report: Shaping a Better Future for the Filipino Workforce.

<sup>87</sup> Interview with DOLE representatives. 22 May 2025.

<sup>88</sup> Philippine Statistics Authority.

<sup>89</sup> Alibudbud, R. (2023) "Addressing the Burnout and Shortage of Nurses in the Philippines," Sage Open Nursing. doi: 10.1177/23779608231195737. PMID: 37584034; PMCID: PMC10424539.

<sup>90</sup> Pepito, V., A. Loreche, R. Legaspi, R. Guinaran, T. Capeding, M. Ong, and M. Dayrit (2025) "Health workforce issues and recommended practices in the implementation of Universal Health Coverage in the Philippines: a qualitative study," Human Resources for Health (2025) 23:21 <https://doi.org/10.1186/s12960-025-00988-3>

<sup>91</sup> <https://www.hospitalmanagementasia.com/talent-skills/fighting-philippines-growing-nursing-shortage-capitol-medical-centre-shares-retention-approach>.

<sup>92</sup> <https://newsinfo.inquirer.net/1764748/doh-it-will-take-12-years-for-ph-to-solve-shortage-of-nurses-23-years-for-doctors>

laments that “the nurses we lost are our best nurses. It is painful that the trained ones are the ones who leave. The ones left with us are either the new ones or are very old, because their salary (overseas) is five times what we pay here.”<sup>93</sup>

DOLE shared ongoing programs to address the shortage of nurses, including scholarships, nurse deployment to underserved areas in the Philippines, and upskilling initiatives for underboard nurses, as well as efforts to increase salaries for government nurses and the push for private hospitals to improve compensation. But it would also be good to consider the non-financial reasons for why nurses choose to go overseas, such as “emotional exhaustion, moral distress, and systemic inequities, frustration caused by insufficient staffing, lack of resources, and minimal institutional support during crises (Norh 2024, p.157).<sup>94</sup> Nurse retention strategies should respond to these needs. Private hospitals will also benefit from “a comprehensive approach that integrates professional development opportunities, recognition of contributions, and robust support systems” (ibid, 158). The case of the University of the Philippines Manila-School of Health Sciences (see Box 1) illustrates how nurse retention can be achieved through the provision of scholarships to disadvantaged students to train in healthcare and requiring them to serve in underserved communities through a Return Service Agreement.

At the moment, nursing is also identified by DOLE as a Mission Critical Skill, and as such, there is an imposed deployment ceiling that is reevaluated periodically. In 2022, the cap for deployment was at 7000 nurses.

With regard to STEM and IT-BPM workers, DOLE explained that IT-BPM workers have traditionally been low-skilled, but there is now a growing demand for highly technical roles due to digitalization and AI adoption. In fact, the technology market is forecasted to grow to USD 51.55 billion by 2030<sup>95</sup>, which could lead to more openings in the technology industry in the future. There is little data on the out-migration of STEM professionals, such as engineers and other scientists from the Philippines, but brain drain not only in health but also in other sectors has been a persistent concern. In the past, STEM professionals looked for work overseas because of the inability of the economy to absorb graduates. In 2016, the country produced 160,000 science and technology graduates, but demand then was low<sup>96</sup>. But as DOLE mentioned, this demand has been increasing with the rapid expansion of the science and technology sectors. However, there remain perceptions of higher salaries and better advancement opportunities for scientists abroad.

To reverse the effects of brain drain, the DOST is banking on its *Balik Scientist Program (BSP)* to encourage “experts, scientists, inventors, and engineers” to return and employ their skills in the country to promote “scientific, agro-industrial, and economic development.”<sup>97</sup> Under this program, professionals who are Filipino or with Filipino descent and with higher education degrees are invited

<sup>93</sup><https://www.ateneo.edu/news/2025/05/22/ateneo-study-highlights-workforce-hurdles-universal-health-care-philippines>

<sup>94</sup> Norh, Susa (2024) “Enhancing nurse retention in private hospitals in the new normal: A comprehensive approach for post-pandemic healthcare stability,” *Davao Research Journal*, 15(4):149-160  
DOI:10.59120/drj.v15i4.285

<sup>95</sup> <https://www.mordorintelligence.com/industry-reports/philippines-ict-market>

<sup>96</sup> <https://www.pids.gov.ph/details/s-t-innovation-ecosystem-can-address-brain-drain-in-ph-expert>

<sup>97</sup> <https://bsp.dost.gov.ph/our-purpose/>

to apply for short (15 days to 6 months), medium (6 months to 1 year), or long term (1-3 years) employment in sectors or institutions identified by the DOST. If the intention is for returning professionals to stay permanently, or longer than the duration of their BSP engagement, it might be worth considering the provision of employment or placements that will last longer than 3 years.

Similarly, construction is a key employment-generating sector, with the majority of workers in road and railway construction, building construction, and other services. DOLE notes that while the sector faces short-term employment challenges because of project-based work, new graduates tend to be attracted to promising benefits and working conditions<sup>98</sup>. This fact runs counter to the perceived stereotype of construction work, which can still dissuade SHS students from enrolling in TVL tracks in construction. As mentioned earlier, there are about 106,000 assessed TVET graduates in construction in 2024 but there remains a shortage, particularly for skilled labour. More than two million workers are needed to meet labour requirements of the construction industry in 2025<sup>99</sup> as many of the skilled workforce leave for countries, for instance in the Middle East, that offer higher wages<sup>100</sup>. Incidentally, what TESDA also mentioned as in high demand is truck driving because “potential truck drivers either go abroad or move to TNVS [Transportation Network Vehicle Services] work.”<sup>101</sup>

In response to labour shortages from overseas migration, DOLE brought up the existence of a technical working group tasked with assessing mission critical skills, the complete listing of which is still unavailable. To prevent a disadvantage to local labour markets, collaborations between DOLE and the Department of Migrant Workers (DMW) are necessary, with DOLE emphasizing the importance of a whole-of-government approach to retain skilled workers in the Philippines.” (DOLE interview)<sup>102</sup>

### **BOX 1. A SCHOOL PRODUCING HEALTH WORKERS WHO STAY**

Many foreign-trained nurses working in the developed countries trace their roots to the Philippines. Taking up nursing in college is a popular field of study among young Filipinos, and one important motivation for this is that nursing is a passport to working abroad. The United States was the main destination of Filipino nurses before the Philippines launched the overseas employment program in 1974. The adoption of American nursing education during the colonial period set the stage for nurses who can be recruited to fill the needs of the US (Choy, 2003). The 1965 immigration reforms in the US opened the doors for Filipino nurses to be recruited and admitted as immigrants in the US. The demand for Filipino nurses became global. Canada, the United Kingdom, Ireland, the Gulf countries, Singapore and other countries also recruited nurses and healthcare workers from the Philippines.

The overseas option spurred the proliferation of nursing programs, especially in the 1990s and 2000s, with the spike in the recruitment of nurses in the US (e.g., Masselink and Lee, 2010; Ortiga 2014) and the demand for nurses expanding to other countries. Between 2008 and 2010, Saudi Arabia recruited 90,382 Filipino nurses, outpacing the numbers of those who went to the UK (15,701) and the US (14,895) (Bautista, Ducanes and David, 2019). The growing demand was matched by more schools producing nursing graduates. Beyond the US, the “traditional” and preferred destination of Filipino

<sup>98</sup> Interview with DOLE representatives. 22 May 2025.

<sup>99</sup> <https://www.jcvassociates.ph/blogs/hard-hats-harder-challenges-the-hurdles-faced-by-construction-consultancy-firms-in-the-philippines>

<sup>100</sup> <https://businessmirror.com.ph/2022/07/13/labor-shortage-in-construction-sector-to-persist/>

<sup>101</sup> Interview with TESDA officials. 25 June 2025.

<sup>102</sup> Interview with DOLE representatives. 22 May 2025.

nurses, nursing in the Philippines has become embedded in the global chain (Ortiga, 2014). In 2011-2012, there were 176,646 students enrolled in nursing; the year before was marked by 86,816 graduates (Philippine Daily Inquirer, 2013). Some doctors even re-trained to be nurses because it was easier to find work abroad as nurses. During this frenzy, the quality of nursing education declined, as indicated by low passing rates in the nursing licensure exams—in 2009, only 40.7 percent of 172,344 takers passed the exams (Philippine Daily Inquirer, 2013). Some schools failed to meet the minimum 30-percent passing rate set by the Commission on Higher Education (CHED) Memorandum Order No. 14 Series of 2009. These worrying trends urged CHED to impose a moratorium on new nursing programs in 2011 (Philippine Daily Inquirer, 2013). The moratorium was lifted in 2022 as a solution to the shortage of nurses in the Philippines (Yang, 2022).

According to data from the Department of Health, of the 617,898 registered Filipino nurses, more than 316,000 are working abroad as of December 2021. Not all of those in the Philippines are practicing number; an unknown number are unemployed or not working as nurses (GMA News Online, 2022). As of 2024, the country produced 37,098 new registered nurses, which is lower than the yearly average of 63,800 a decade ago. According to the World Health Organization, the Philippines has a shortage of 127,000 nurses, which may rise to 250,000 if the government does not address the issue (Politiko, 2025). Bills to increase the salaries of nurses have been introduced in the Philippine Congress as a solution, but even with this measure, will the nurses decide to work in the Philippines? (Politiko, 2025) Will the opening of new nursing programs fill the nursing shortage, or will it produce more nurses for the global labour market? The needed policies go beyond these interventions (Pepito et al., 2025).

Concerning training, the experience of the University of the Philippines Manila School of Health Sciences (UPM SHS) in offering a step-ladder health program with community involvement offers an inspiring example. In 1976, the first UPM SHS was started in Palo, Leyte which can be described as a school of, by and for the people. The idea was to train health workers who come from disadvantaged communities—they have to be nominated and financially supported by their local government unit, and scholars must commit to a Return Service Agreement, where they will serve underserved areas for two years for every year of support they received. The school offers midwifery, nursing and medicine. Students start with midwifery and after passing the licensure exams, they may continue to the nursing program, and those who pass the licensure exams may proceed to the medicine program. For every level completed, students return to their communities for “service leave.”

Students receive a “pass” or “needs tutorial” rather than a numerical grade. As former dean Fidelito Tandinco of the UPM SHS in Palo explained, the system of grading shifts from competition to competency. The training is geared towards going to where health workers are needed.

"The healthcare profession typically produces graduates that go abroad. But in our school, 95% of our graduates are in the country and returned to their endorsing communities," said Tandinco. A tracer study that they conducted bears this out. According to him, for every 10 students that complete midwifery training, only three will go to nursing, and out of those, only one will become a doctor. The school has a good track record—97 to 100 percent of its midwifery graduates pass the licensure exam, with consistent topnotchers. Janus Navier Gatela, one of the midwifery graduates who is now in the nursing program has this to say on going where they are needed: "We are really bound to go back to the grassroots, to the communities *kung saan tayo nanggaling* (where we came from), because we are Filipinos," he said.

The “Tacloban experiment” as the program was called in 1976 has been introduced in Baler, Quezon and Koronadal, Cotabato. All three campuses cover the three major island groupings – Baler in Luzon, Palo in the Visayas, and Koronadal in Mindanao (Chi, 2024).

## 7.5 Conclusion

The preceding discussion highlighted the efforts of, and linkages between, government institutions and the private sector to adapt to the changing needs of labor markets and respond to corresponding training and education requirements.

Given the Philippines’ long history of out-migration, the challenge for institutions is not simply to build a skilled workforce but to retain it. Brain drain has taken place at various levels - from professionals in healthcare and STEM, to students and scholars who study abroad and decide to remain abroad, and to the middle level workforce, for instance, in construction and logistics, whose skills are increasingly needed abroad. Bilateral agreements with foreign governments and institutions can secure the rights of Filipino workers abroad and help with the training of those in the country, but their impact on worker retention has yet to be seen. Nurses, for instance, are often hounded by low pay and overwork, conditions that can drive them to leave regardless of the shortage in the country or the purpose of their training. Collaborations between institutions can lead to better outcomes if policies for worker retention, for instance, through service agreements or definite job placements, can be drawn, and more attractive incentives offered. The prospect of good wages and supportive work environments could entice workers and graduates to stay and could also motivate those abroad to return.

Ultimately, building a skilled workforce that will serve the needs of the country begins with investments in basic education. The basic education curriculum can help shift young people’s perspectives from working abroad towards working in the country. The gap in the quality of public and private education, however, is worth noting. With the exception of the Philippine Science high schools, public schools for basic education tend to underperform in comparison to private schools. While a number of factors, including qualified instructors, resources, and facilities, are necessary to bridge the gap, student access to industry and enterprise-based learning, especially in TVL, could also improve outcomes for lower performing schools. Coordination between government agencies regulating education to streamline and strengthen skills and competencies in basic and higher education is also a good start.

Given the recognition accorded by industry to TVET competencies and National Certifications, the country can also cultivate a competitive workforce that responds to both the immediate and future needs of the labour market by raising awareness of the value of TVL, not only among senior high school students but also among the youth NEET, the underemployed, and those looking towards reskilling and upskilling.

## REFERENCES

- Bautista, John Robert, Ducanes, Geoffrey and David, Clarissa C. (2019). Quality of nursing schools in the Philippines: Trends and evidence from the 2010-2016 nursing licensure examination results. *Nursing Outlook*, 67(3): 259-269, May-June.
- Chi, Cristina (2024). The Philippine school who produces health workers who stay, *Philstar.com*, November 14, <https://www.philstar.com/headlines/2024/11/14/2399332/philippine-school-produces-health-workers-who-stay>
- Choy, Catherine Ceniza (2003). *Empire of Care: Nursing and Migration in Filipino American History*. Durham: Duke University Press.
- GMA News Online (2022). Over 300,000 PNA members are working abroad, June 7, <https://www.gmanetwork.com/news/topstories/nation/834213/over-300-000-nurses-are-working-abroad-pna/story/>
- Masselink, Leah and Lee, Shouh-Yih (2010). Nurses, Inc.: Expansion and commercialization of nursing education in the Philippines, *Social Science & Medicine* 71(1):166-72, July, DOI:10.1016/j.socscimed.2009.11.043
- Ortiga, Yasmin Y. (2014). Professional problems: The burden of producing the “global” Filipino nurse, *Social Science & Medicine*, 115: 64-71, August, DOI: 10.1016/j.socscimed.2014.06.012
- Pepito, Veincent C., Loreche, Arianna M., Legaspi, Ruth S., et al. (2025). Health workforce issues and recommended practices in the implementation of Universal Health Coverage in the Philippines: A Qualitative Study. *Ateneo School of Medicine and Public Health Publications*. April 23. <https://archium.ateneo.edu/asmph-pubs/314/>
- Philippine Daily Inquirer (2013) What went before: Glut of nursing graduates, *Inquirer.net*, July 9, <https://newsinfo.inquirer.net/441097/what-went-before-glut-of-nursing-graduates>
- Yang, Angelica Y. (2022). After 11 years, CHED lifts moratorium on new nursing programs, *Philstar.com*, July <https://www.philstar.com/headlines/2022/07/13/2195123/after-11-years-ched-lifts-moratorium-new-nursing-programs>

## 8.0 ASSESSMENT OF SKILLS DEVELOPMENT AND UTILISATION AT ORIGIN – UKRAINE

Authors: Viktor Borshchevskyy, Myroslava Chekh, Iryna Lapshyna, Yevheniy Matvyeyev, Oksana Vasylytsya, Valentyna Zasadko (Ukrainian Catholic University)

### 8.1 Training and Education in STEM, Health and Construction

#### 8.1.1 Alignment of Curricula with Labour Market Demands

In Ukraine, the alignment between education and labour market needs remains inconsistent across the health, STEM, and construction sectors. While the healthcare system has undergone reforms aimed at modernization, educational programs have been slower to adapt. Although most medical graduates find employment within six months, the practical orientation of their training and responsiveness to patients' expectations remain concerns. Newer disciplines such as physical therapy and rehabilitation, which emerged without rigid institutional traditions, have demonstrated greater flexibility and modernity in their curricula. As one of our interviewees explained:

*The general trend appears to be that in areas where there are no strong traditional constraints, and there is openness to change, there is a greater likelihood of developing more modern and responsive educational products» (L4S\_transcript\_UA\_pol\_1).*

In the construction sector, a significant gap persists between training content and industry needs. Educational institutions rarely offer programs focusing on energy-efficient technologies or sustainable construction, forcing employers to independently train specialists.

*Very often, developers have to find specialists on their own, as educational institutions do not currently offer programs or provide the knowledge required for these specialties (L4S\_transcript\_UA\_pol\_4 ).*

STEM education, particularly in computer science, has shown more progress, but remains largely theoretical and detached from practical industry applications. Emerging fields like artificial intelligence, biotechnology, and green energy are introduced too slowly, leading to skill shortages in these growing sectors. The business sector expresses a clear demand for an increased number of high-quality educational programs.

*In general, businesses tend to take a rather sceptical view: in their perception, there are not many programs that adequately match labour market needs. However, in reality, there may be more such programs than businesses are aware of.*

*While there is certainly a desire to see a greater number of relevant programs, the current situation is not entirely negative (L4S\_transcript\_UA\_exp\_3).*

Experts highlight that Ukraine lacks a systemic mechanism to align education with labour market forecasting. In contrast to many European countries, where dedicated agencies coordinate education with workforce needs, Ukraine relies on ad hoc cooperation initiated by proactive institutions or individuals.

*"Our vocational education is lagging behind the labour market. In Europe, agencies annually forecast labour market needs and coordinate them with universities, but here, an effective head of an educational institution tries to establish such cooperation individually." (L4S\_transcript\_UA\_pol\_4).*

### 8.1.2. Strengths and Weaknesses of Curricula

The strengths of Ukrainian education lie in its strong theoretical foundation and high-quality knowledge transfer, which allows graduates, especially in STEM and medicine, to be internationally competitive. Innovative examples, such as the integration of rehabilitation studies and IT-focused programs at leading universities (e.g., Ukrainian Catholic University and Kyiv School of Economics), demonstrate growing responsiveness to global trends.

However, several weaknesses hinder alignment with market needs:

- **Institutional inertia:** Resistance to curriculum change due to bureaucratic and outdated structures.
- **Resource constraints:** Outdated infrastructure and lack of modern teaching equipment in technical and vocational institutions.
- **Skill mismatch:** Strong academic training but insufficient practical experience, particularly in engineering and construction.
- **Fragmented communication:** Weak cooperation between universities and employers, resulting in curricula that overlook specific industry needs.
- **Underdeveloped adult education:** Limited opportunities for lifelong learning and reskilling among professionals.

*"After all, most of our higher education institutions are still primarily focused on students who are, if we are talking about a bachelor's degree, around 18–22 years old, or if it is a master's degree — then 22, 23, maybe 24 years old. And that, overall, is a problem that adult education is underdeveloped here.*

*It is currently being developed through schools or continuing education programs, and many higher education institutions are working on these. At the Ministry of Education, we have deliberately chosen not to license or regulate them in any way.*

*Access to such programs is currently supported through funding for veterans, unemployed individuals, and others who want to retrain, this is handled through the Ministry of Economy, using vouchers" (L4S\_transcript\_UA\_pol\_2).*

Consequently, many graduates require substantial on-the-job training to adapt to real work environments, especially in construction and engineering. Dual education models, combining

theoretical and practical learning, exist in select institutions like Lviv Polytechnic and Dnipro Polytechnic, but remain exceptions rather than the norm.

### 8.1.3. Standardisation of Informal Training and Certification

Ukraine faces systemic challenges in formalising informal training and certification, particularly in the construction and STEM sectors. Certificate and short-term training programs are limited, especially in hardware-related engineering fields where infrastructure costs are high. Informal training often occurs through workplace initiatives rather than accredited programs.

The government has initiated some steps to address these gaps. The Ministry of Education and the Ministry of Economy support continuing education through vouchers for veterans and unemployed individuals seeking retraining<sup>103</sup>. However, a comprehensive Law on Adult Education, which would institutionalize lifelong learning, is still pending. This lack of legislative framework restricts the recognition of informal learning outcomes and hinders the scalability of reskilling initiatives.

In practice, the private sector often compensates for the absence of formal mechanisms. Large companies in IT and construction organize internal training programs, mentor-based learning, and support for certification exams. The growing drone production industry, for example, has catalysed new informal training opportunities that could serve as models for other sectors.

### 8.1.4. TVET–Industry Partnerships

Partnerships between Technical and Vocational Education and Training (TVET) institutions and industry remain uneven but are gradually expanding. Notable examples include:

- Lviv Polytechnic University and the Lviv IT Cluster, which implement dual education programs combining academic study with hands-on training in technology companies.
- Dnipro Polytechnic University, which collaborates with energy and mining enterprises in the Dnipro region, tailoring curricula to industrial needs.

*Lviv Polytechnic and the Lviv IT cluster represent advanced dual education. Another very active collaboration example is Dnipro Polytechnic, which works with energy companies, mining companies, reflective of the Dnipro region, energy and mining, metallurgy, processing, and so on.*

*These are currently our two leaders in dual education when it comes to higher education in Ukraine (L4S\_transcript\_UA\_pol\_2).*

- Sumy State University and Kyiv-Mohyla Academy, which partner with technology firms to modernize STEM programs.

<sup>103</sup> Ministry of Veterans Affairs of Ukraine. Veterans can get vouchers for education.

<https://mva.gov.ua/presenter/category/86-novini/zahisniki-ta-zahisnitsi-mozhut-otrimati-vaucheri-dlya-zdobuttya-osviti>

In healthcare, internships and residency programs remain crucial forms of practical training. However, similar structured collaboration is lacking in construction and traditional engineering. Experts suggest that expanding dual education and incentivizing company participation through tax benefits or co-funded programs could enhance the quality and employability of graduates.

To summarise, Ukraine's training and education systems in STEM, health, and construction demonstrate strong academic traditions but limited responsiveness to contemporary market dynamics. While progress is evident in newer disciplines and select dual-education partnerships, systemic reform is needed to synchronize educational planning with economic strategy.

## 8.2 Labour Market Demand and Supply

### 8.2.1 Skill Mismatch and Graduate Unemployment in Health, STEM, and Construction

Ukraine's labour market displays a structural contradiction: a growing number of highly educated individuals coexists with persistent unemployment, particularly among graduates in health, STEM, and construction-related fields. Official statistics reveal that over half of registered unemployed persons hold higher education degrees. However, this does not indicate overqualification but rather a phenomenon of "over-diplomation," a situation where individuals possess formal degrees but lack the applied competencies demanded by the economy.

*This may be an indicator of an oversupply of higher education diplomas among the population. People are not exactly overqualified, they are over-diplomated. It seems that in Ukraine higher education is very accessible. In all public spheres, as in the post-Soviet system, it worked on the model of low quality and high accessibility (L4S\_transcript\_UA\_pol\_1).*

The mismatch stems from several interrelated factors:

- a) **Misalignment between education and labour market needs.**  
Educational programs, particularly in engineering and construction, remain theoretical and detached from industry practice. The absence of forecasting mechanisms to align curricula with economic trends exacerbates this disconnect. For instance, although Ukraine faces growing demand for energy-efficient construction technologies and digital engineering, educational institutions have been slow to incorporate these subjects into training programs.
- b) **Misinformed selection of fields of study.**  
Students often make career choices without sufficient labour market information or guidance. Cultural and social factors inherited from the Soviet model continue to prioritize university education over vocational training, leading to an oversupply of degree holders and an undersupply of technicians, skilled tradespeople, and applied scientists. Career guidance mechanisms at secondary and community levels remain weak, leaving young people unaware of high-demand technical professions.
- c) **Non-availability of jobs and weak transition to employment.**  
Employers frequently report that graduates, though formally qualified, are unprepared for real-world work environments. In healthcare, newly graduated doctors and nurses often face

barriers entering state medical facilities due to limited budget-funded positions, low salaries, and outdated employment structures. In STEM, many companies require practical experience with digital tools or industrial technologies not taught in universities. As a result, on-the-job retraining becomes the norm, and some graduates either emigrate or shift to unrelated sectors.

d) **Decline in fundamental education quality.**

Experts note a steady decrease in mathematics and physics proficiency among engineering entrants, reducing the quality of graduates in core technical fields. While Ukraine continues to produce top-tier IT professionals and researchers, the overall readiness of engineering graduates for industrial application is declining.

Collectively, these factors explain why high educational attainment does not guarantee employment, particularly in technical and health professions. The system continues to produce more graduates than the domestic economy can absorb, especially in traditional disciplines with limited modernization.

### 8.2.2 Paradox of Nursing Graduate Growth and Health Workforce Shortages

A particularly concerning trend in Ukraine's labour market is the paradoxical coexistence of rising numbers of health graduates, especially nurses, and persistent shortages of healthcare personnel. Over the past five years, nursing schools have expanded their output, yet hospitals and clinics face increasing difficulty filling positions.

Several interlinked dynamics explain this contradiction:

- **Emigration and workforce mobility.**

Many nurses and doctors migrate abroad, especially to EU countries, attracted by significantly higher wages, better working conditions, and professional development opportunities. The war has further intensified these migration flows.

- **Weak retention and entry mechanisms.**

There is no national registry or licensing system that tracks medical professionals or regulates entry into practice. Consequently, many graduates never formally enter the profession. Those who do often leave within the first few years due to poor working conditions, lack of career progression, or rigid labour relations.

*We do not have a registry of medical professionals. The data collected by the National Health Service are incomplete and do not fully reflect the situation. Likewise, official reporting provides only a partial picture.*

*Labour market demand data are also highly approximate. We cannot assess what the actual structure of the market should be because demand is significantly distorted. This requires structural solutions, such as a registry of medical professionals. And for such a registry, licensing is essential (L4S\_transcript\_UA\_pol\_1).*

- **Low remuneration and professional stagnation.**

Despite the social importance of the sector, public sector wages for nurses remain among the lowest in the economy, with limited scope for differentiation based on experience or skill<sup>104</sup>. This discourages both new entrants and retention of experienced workers.

- **Policy gaps in workforce planning.**

Ukraine lacks a comprehensive health workforce strategy that links educational output with regional demand projections. The absence of accurate data further hampers planning, as national statistics undercount professionals working informally or abroad.

### Policy Directions

Recent initiatives aim to correct these imbalances. The National Health Service of Ukraine (NHSU) has proposed creating a unified registry of medical professionals and introducing mandatory licensing. The Ministry of Health is also advocating for incentive-based retention policies, including salary increases, housing support, and rural practice bonuses. Additionally, international donors and NGOs are supporting targeted programs that retrain and upskill healthcare workers to meet post-war needs, particularly in rehabilitation, mental health, and emergency medicine.

However, the impact of these policies will depend on long-term implementation, improved data collection, and inter-ministerial coordination between the Ministry of Health, the Ministry of Education, and the Ministry of Economy.

### 8.2.3 Demand and Supply in Health, STEM and Construction

In August 2025, the Ukrainian labour market experienced a shortage of personnel. According to data from the Unified Job Portal<sup>105</sup>, which combines offers from the State Employment Service and leading commercial websites, there were 241,000 vacancies available, while only 132,000 people were actively looking for new jobs. On average, there were two vacancies per applicant.

#### Health Sector

The Ukrainian health sector faces a structural shortage of qualified personnel, particularly in rural areas and specialized care (rehabilitation, mental health, and emergency services)<sup>106</sup>.

<sup>104</sup> World Health Organization, Regional Office for Europe. *Results of initial health labour market analysis in Ukraine*. (Nov 2024). [https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm\\_source=chatgpt.com](https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm_source=chatgpt.com)

<sup>105</sup> State employment service 2025 <https://www.dcz.gov.ua/news/singlenews/1063>

<sup>106</sup> *Results of initial health labour market analysis in Ukraine*. World Health Organization, Regional Office for Europe. (Nov 2024). [https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm\\_source=chatgpt.com](https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm_source=chatgpt.com)

Although the number of graduates has increased, the active workforce is shrinking due to emigration and early career exits. Without systemic intervention, the shortage of nurses and general practitioners is projected to deepen over the next 5–10 years, especially in regions heavily affected by war and population displacement.

### STEM Sector

In STEM, the situation is more complex. IT and digital engineering fields are experiencing high demand and relatively balanced supply, driven by the private sector's investment in education partnerships. However, traditional engineering disciplines, mechanical, electrical, and industrial, are facing acute shortages, as enrolment continues to decline due to perceptions of low prestige and outdated facilities.

*In STEM, there are a huge number of state-funded study places. Very often, we face the problem that these specialties are simply not popular enough. As a result, state-funded slots go unfilled" (L4S\_transcript\_UA\_pol\_2).*

The mismatch between university output and industrial demand is expected to persist, with labour deficits in applied technical fields likely to grow over the next decade.

### Construction Sector

The **construction industry** presents one of the most critical skill gaps in Ukraine's post-war reconstruction context. The demand for skilled builders, architects, and engineers far exceeds current supply. Despite a modest increase in construction-related training programs, youth interest in the sector remains low due to its reputation for physical hardship and low pay.

Over the next 5–10 years, the demand for construction professionals is projected to surge, driven by large-scale rebuilding and infrastructure renewal. Without targeted vocational reforms, Ukraine risks a chronic shortage of skilled labour in this key sector.

## 2.4 Policies and Incentives for Attracting Workers to Health, STEM, and Construction

Recognizing these challenges, Ukraine has begun introducing policy instruments and incentives to attract students to high-demand sectors.

### Financial Incentives

- **State-funded scholarships and tuition waivers** for priority specialties, including nursing, medicine, and engineering.
- **Wage supplements and housing subsidies** for medical workers in rural areas.
- **Grants for students in STEM disciplines**, particularly IT, data science, and renewable energy engineering, financed through public-private partnerships.
- **Post-war reconstruction programs** include stipends for construction apprentices and incentives for companies offering dual-education placements.

### Non-Financial Incentives

- **Career guidance and awareness campaigns** highlighting the social value and career potential of technical professions.
- **Academic mobility programs** that allow students to gain international experience while remaining connected to domestic institutions.
- **Expansion of dual education models** linking universities and employers to ensure students gain practical experience.
- **Recognition of informal learning and certification** to facilitate retraining for adults seeking to enter high-demand fields.

While these measures are promising, experts note that their impact remains limited due to fragmented implementation and inconsistent funding. A more comprehensive incentive framework is needed, linking financial support with long-term workforce planning.

### 8.2.5 Enrolment and Workforce Projections, Data Systems and Policy Coordination

Enrolment trends in Ukraine's health, STEM, and construction education programs reflect both **policy priorities** and **societal perceptions**:

- **Health:** Student enrolment in nursing and medicine has risen steadily; however, dropout rates and post-graduation migration continue to offset the benefits. Workforce projections indicate persistent shortages in nurses and primary care physicians by 2030 unless retention measures improve.
- **STEM:** Enrolment is high in computer science and IT but declining in traditional engineering disciplines. The demand for data scientists, environmental engineers, and AI specialists is expected to grow sharply in the coming decade.
- **Construction:** Enrolment in vocational construction programs remains low, despite reconstruction-driven demand. Policy efforts are underway to rebrand construction careers and improve technical training facilities.

#### Data Gaps

A major barrier to effective workforce planning is the absence of up-to-date and integrated data systems. Ukraine lacks comprehensive registries for health professionals, certified engineers, and construction workers. Labour market forecasts are fragmented across ministries and rarely shared with educational institutions.

Efforts to address this include:

- The draft Law on Adult Education, which would establish mechanisms for continuous learning data collection.
- The Ministry of Economy's voucher program supports retraining for unemployed and veteran populations.
- Donor-supported initiatives for creating labour market observatories that integrate education, employment, and demographic data.

To summarise, Ukraine's labour market faces deep structural imbalances between the supply of educated individuals and the actual demand for skilled professionals in critical sectors. Skill mismatch, weak career guidance, emigration, and outdated training systems contribute to persistent unemployment among graduates.

While the government has introduced targeted incentives and partnerships to strengthen health, STEM, and construction workforce pipelines, more coordinated action is required. Future policy priorities should include:

- Establishing robust forecasting and labour intelligence systems.
- Expanding dual education and employer partnerships.
- Enhancing the attractiveness of technical careers through financial and social recognition.
- Building comprehensive registries to inform policy and resource allocation.

Addressing these gaps will be central to ensuring that Ukraine's **post-war recovery and modernisation efforts** are supported by a capable, well-trained, and adequately motivated workforce.

### 8.3 Migration of STEM, Health and Construction Personnel (from origin country)

Since 2022, Ukraine has experienced substantial emigration of skilled personnel. Emigration of nurses, doctors, engineers, IT specialists and construction workers is driven by a mix of economic, professional and security motivations. Key drivers identified in interviews and labour-market data include:

#### a. Economic factors

- **Low wages** in the public sector (especially for nurses and many junior medical staff) make foreign offers financially attractive.

*People will only come back when there is a favourable economic situation for them, when there is a decent salary (L4S\_transcript\_UA\_pol\_4).*

- **Weak social protections and pension prospects** reduce long-term security for professionals.
- **Irregular pay and precarious contracts** in construction and some private engineering roles push workers toward more stable foreign employment.

#### b. Professional factors

- **Limited career progression and professional autonomy** at home: many clinicians and engineers report narrow or poorly structured career paths and few opportunities for promotion or research funding.
- **Insufficient facilities and equipment:** hardware-intensive STEM and construction fields suffer from outdated labs, tools and site conditions; health workers face clinical environments lacking modern equipment. These conditions make practicing abroad professionally more attractive.

- **Recognition and professional standards abroad:** Ukrainian specialists are often well-trained academically and can competitively enter EU labour markets where credentials and experience command higher standing and pay.

### c. Security and displacement

The war has introduced **forced migration** dynamics: destruction of homes, community breakdown, and mobilization create insecurity that accelerates departures. Interviewees stress that many recent moves are survival-driven rather than purely economic

*People are not leaving because they are looking for a better life abroad, but because their homes have been destroyed (L4S\_transcript\_UA\_pol\_2).*

### d. Labour-market signalling and opportunity

- **Active recruitment** by host countries and simplified licensing routes for Ukrainian health professionals have created clear pathways abroad.
- **Migration network effects:** early migrants establish connections that reduce migration costs for later cohorts (information on vacancies, housing, credential recognition).

### Consequences for supply in Ukraine

Despite large numbers of graduates (e.g., nursing cohorts), the active domestic stock of practitioners falls because many either emigrate, move to private practice, or are mobilized. This yields the counterintuitive situation of rising graduate output yet acute sectoral shortages.

#### 8.3.1 How unemployment and conditions of service influence outflow

Even where unemployment among degree-holders exists, the primary drivers of emigration are not always lack of jobs but poor job quality:

- **Unemployment among the highly educated** is often due to credential inflation and skill mismatch (“over-diplomation”): diplomas do not guarantee marketable practical skills, prompting graduates to seek better-matched opportunities abroad.
- **For those employed**, low pay, lack of clear career trajectories, and poor working conditions (especially in frontline health roles and construction sites) push professionals to leave.
- **In STEM**, while IT roles have shown resilience and remote work options, many hardware-oriented engineers face stalled careers at home and therefore migrate.

#### 8.3.2 Existing retention policies and employer measures

Ukraine has some targeted but limited measures aimed at retention. These exist across government and private actors, but scale and coherence vary:

#### Government-level and public incentives

- **Salary supplements and rural bonuses** for health workers in underserved areas (intended to improve retention in primary care and rural hospitals).
- **Housing support and service-related bonuses** in select regional schemes to keep staff in high-need posts.
- **Retraining vouchers and labour market programs** (administered by the Ministry of Economy) to help unemployed adults and veterans re-skill for high-demand roles.
- **Draft Law on Adult Education** (pending) aims to formalize lifelong learning and could expand short-cycle retraining options that improve domestic employability.

### Sector and employer responses

- **Corporate academies and in-house training:** major IT firms, some manufacturing and larger construction firms run their own training pipelines and pay for certification, reducing staff turnover by investing in employees' skills and career paths.
- **Dual-education pilots** (e.g., partnerships at Lviv Polytechnic, Dnipro Polytechnic) embed internships and guaranteed employer engagement to smooth school-to-work transition. These models improve retention when employers commit to hiring graduates.
- **Targeted reforms** in family medicine and primary care introduced clearer career paths and performance-linked pay in some specialties, temporarily reducing migration of young doctors.

Most retention measures are fragmented, underfunded or pilot-scale. Nationwide, salary and working condition gaps remain large compared to EU standards, limiting their effectiveness in stemming emigration at scale.

### 8.3.3 Bilateral Agreements, Memorandum of Understandings and Ethical Considerations

#### Formal bilateral frameworks:

- As of the latest sector reports and expert interviews, there are no comprehensive, sector-specific bilateral labour agreements that systematically govern the migration of nurses, doctors, engineers or construction workers from Ukraine to major destination countries.
- Some host countries have simplified recognition or fast-track licensing pathways for Ukrainian health professionals (implemented ad hoc in response to the crisis), but these are not always embedded in negotiated, reciprocal agreements with protective safeguards.

#### Ethical gaps and risks

- **Diploma recognition and worker protections** are inconsistent across destinations, producing ethical risks (exploitation, mismatch between job roles and credentials).
- The absence of comprehensive agreements leaves Ukraine relatively vulnerable to unmanaged brain drain, while limiting its ability to negotiate protective terms (e.g., temporary migration with guaranteed pathways back, training exchange linked to equipment support, or bilateral funding for in-country capacity building).

## Prospects

- Experts see scope for regulated, ethical mobility frameworks—negotiated with EU partners—that would protect Ukrainian workers’ rights, support credential recognition, and include cooperation on training and capacity-building in Ukraine (e.g., exchange programs tied to investments in domestic training infrastructure).

### 8.3.4 Concluding observations and policy implications

- Migration of STEM, health and construction personnel from Ukraine is driven primarily by security and quality-of-work factors (low pay, limited prospects, war-related disruption), not simply better wages abroad.
- Current retention measures exist but are insufficiently scaled or coordinated to offset large outflows.
- The absence of robust bilateral migration agreements creates both ethical risks for migrants and strategic vulnerabilities for Ukraine’s workforce planning.
- Policy priorities to mitigate unmanaged brain drain should include: improving pay and working conditions (especially in health and construction), scaling dual education and corporate partnership models, accelerating recognition and upskilling pathways (including adult education law implementation), and negotiating ethical, reciprocal mobility agreements with destination countries that include safeguards and reinvestment in Ukrainian training capacity.

## 8.4 Conclusion

The analysis of **training, labour market demand and supply, and migration** in Ukraine’s health, STEM, and construction sectors reveals a deeply interconnected system affected by war, demographic shifts, and structural weaknesses.

Ukraine continues to produce a **large pool of graduates** in STEM, health, and construction, reflecting strong academic traditions and an extensive vocational network. However, these programmes often lack **practical, market-responsive components** and updated equipment, limiting graduates’ readiness for modern workplaces. The **labour market** faces a paradox: rising numbers of qualified individuals yet growing shortages in critical occupations. This mismatch is intensified by war-related displacement, low wages, and limited professional opportunities, pushing many skilled workers abroad.

The result is a combination of **brain drain and brain waste**, rather than sustainable brain circulation. Nurses, doctors, engineers, and technicians emigrate to countries offering stability, better conditions, and recognition, while Ukraine struggles to replace them. At the same time, many skilled migrants are underemployed abroad—unable to work in their full capacity due to credential barriers—illustrating elements of **brain waste**.

### 8.4.1 Policy Directions: Migration Corridors and the “Triple Win”

In theory, managed migration corridors through **bilateral or regional agreements** could deliver a “triple win”, benefiting the destination country (labour supply), the origin country (remittances and skill development), and the individual worker (career advancement). In practice, Ukraine’s migration patterns in health, STEM, and construction remain **unregulated and unilateral**, with most flows benefiting **destination countries disproportionately**.

The lack of formal **bilateral agreements or ethical recruitment frameworks** means that outflows are largely demand-driven by foreign employers rather than strategically managed by Ukrainian authorities. As a result, the “triple win” remains **unrealized**—Ukraine bears the training cost and workforce loss, while host countries reap the productivity benefits. Developing structured agreements that include return pathways, training exchanges, and investment in Ukrainian institutions could transform this one-sided dynamic into a more equitable model of **brain circulation**.

#### 8.4.2 Addressing the Shortage-Surplus Discrepancy

Discrepancies between international assessments (which often point to shortages) and local government reports (sometimes citing unemployment among graduates) stem from **fragmented data systems and mismatched qualification frameworks**. At the ground level, many graduates lack the specific competencies demanded by employers, while internationally recognized specialists continue to emigrate.

Bridging this divide requires **coordinated labour market intelligence**, real-time workforce tracking, and policy alignment between education, employment, and migration ministries. Equally crucial is embedding **ethical recruitment and reinvestment clauses** in international agreements to ensure fair processes that do not exploit Ukraine’s human capital crisis.

Thus, at present, Ukraine’s situation leans toward brain drain rather than balanced brain circulation. Without comprehensive migration governance and fair partnership frameworks, the benefits are skewed toward destination countries. The way forward lies in **strategic coordination between training, employment, and migration policy**, underpinned by bilateral agreements that ensure **ethical, sustainable, and mutually beneficial labour mobility**, transforming Ukraine’s skilled migration from a loss into a lever for recovery and innovation.

## KEY REFERENCES

State employment service 2025 <https://www.dcz.gov.ua/news/singlenews/1063>

World Health Organization, Regional Office for Europe. (Nov 2024). *Results of initial health labour market analysis in Ukraine*. [https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm\\_source=chatgpt.com](https://www.who.int/europe/publications/i/item/WHO-EURO-2024-10458-50230-75692?utm_source=chatgpt.com)

Ministry of Veterans Affairs of Ukraine. Veterans can get vouchers for education. <https://mva.gov.ua/prescenter/category/86-novini/zahisniki-ta-zahisnitsi-mozhut-otrimati-vaucheri-dlya-zdobuttya-osviti>

## Appendix 1. List of interviews with stakeholders

Partner Institution	Authors	List of institutions and or Experts Interviewed
Scalabrini Migration Center	Maria Andrea Soco-Roda, Maruja MB Asis and Geoffrey M. Ducanes	<p>5 Philippine government agencies 3 European organizations 1 college of nursing 3 private recruitment agencies 1 training center 1 independent migration expert</p> <p>We interviewed a total of 23 key informants. In some organizations, we conducted more than interview; in other organizations, one interview may involve more than one key informant.</p>
Centre for Migration Studies, University of Ghana	Mary Boatemaa Setrana, Justice Richard Kwabena Owusu Kyei, John Narh, Joseph Kofi Teye	<p>Ministry of Health Ghana Health Services Nursing and Midwifery Council of Ghana Commission of Technical Vocational Education and Training Ghana Tertiary Education Commission International Migration Policy Recruitment and Advisory Center Ghanaian migrant nurse in the UK Recruitment Agency in Canada 2 local recruitment agencies Expert in international recruitment Don Bosco Training Institute SIMONCOT Ghana Institute of Engineering Ministry of Labour, Jobs and Employment Ministry of Foreign Affairs and Regional Integration Xanthi and Associates International Organisation for Migration Idream Consortium High Commission of Canada in Ghana</p>

University of Ibadan	Olayinka Akanle	<ol style="list-style-type: none"> <li>1. Federal University</li> <li>2. School of Nursing</li> <li>3. Capital Nigeria (NGO)</li> <li>4. Nigeria Labour Congress</li> <li>5. Nigeria in Diaspora Commission</li> <li>6. National University Commission</li> <li>7. Ministry of Health</li> <li>8. Nigeria Immigration Service</li> <li>9. Nursing Sciences</li> <li>10. Win Travel Limited</li> <li>11. Nigerian Society of Engineers</li> </ol>
Ukrainian Catholic University	Viktor Borshchevskyy, Myroslava Chekh, Iryna Lapshyna, Yevheniy Matvyeyev, Oksana Vasyltytsya, Valentyna Zasadko	<ol style="list-style-type: none"> <li>1. Ministry of Health care of Ukraine</li> <li>2. Ministry of Education and Science of Ukraine</li> <li>3. Ukrainian Catholic University, Innovation Office</li> <li>4. Parliament</li> <li>5. Lviv region council</li> <li>6. The Frontier Institute (NGO)</li> <li>7. International Organisation for Migration</li> <li>8. Ministry of National Unity of Ukraine</li> <li>9. International recruiting agency</li> <li>10. Ministry of Social Policy of Ukraine</li> <li>11. Institute for Demography and Social Studies</li> <li>12. International Institute of Education, Culture and Diaspora Relations</li> </ol>
The International Institute of Migration and Development, India	S Irudaya Rajan, Rohit Irudayarajan and Varsha Joshi	<p>Future International Skills Academy (FISA), Government Industrial Training Institute (Kerala), Jeyamata Industrial Training Institute (Pvt Limited), Marian Engineering College (Pvt Limited), Barton Hill Government College and Trivandrum Medical College (Kerala)</p> <p>6 Interviews Conducted - 3 with experts and 3 with practitioners</p>