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EBES - Eurasia Business and Economics Society

EBES is a scholarly association for scholars involved in the practice and study of economics, finance, and business worldwide. EBES was founded in 2008 with the purpose of not only promoting academic research in the field of business and economics but also encouraging the intellectual development of scholars. In spite of the term "Eurasia", the scope should be understood in its broadest term as having a global emphasis.

EBES aims to bring together worldwide researchers and professionals through organizing conferences and publishing academic journals, and increase economic, financial, and business knowledge through academic discussions. Any scholar or professional interested in economics, finance, and business is welcome to attend EBES conferences. Since our first conference in 2009, around *19,538* colleagues from *102* countries have joined our conferences, and *10,442* academic papers have been presented. *EBES has reached 3,298 members from 87 countries.*

Since 2011, EBES has been publishing two journals. One of those journals, ***Eurasian Business Review*** - *EABR*, is in the fields of industrial organization, innovation, and management science, and the other one, ***Eurasian Economic Review*** - *EAER*, is in the fields of applied macroeconomics and finance. Both journals are published quarterly by ***Springer*** and are indexed in ***Scopus***. In addition, EAER is indexed in the ***Emerging Sources Citation Index*** (*Clarivate Analytics*) and EABR is indexed in the ***Social Science Citation Index (SSCI)***. EABR's 2023 CiteScore is 6.9 (Q1) & 2023 JCR IF is 4.0 (Q1). EAER's 2023 CiteScore is 6.0 (Q1) & 2023 JCR IF 2023 is 2.5 (Q2).

Furthermore, since 2014, Springer has started to publish a new conference proceedings series (***Eurasian Studies in Business and Economics****),* which includes selected papers from the EBES conferences. The series has been recently indexed by **SCOPUS**. In addition, the 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th & 27th, 28th, 29th (Vol. 1), 30th, 33rd, and 34th EBES Conference Proceedings have already been accepted for inclusion in the ***Conference Proceedings Citation Index - Social Science & Humanities (CPCI-SSH).*** Other conference proceedings are in progress.

On behalf of all EBES officers, I sincerely thank you for all your support in the past. We look forward to seeing you at our forthcoming conferences. We very much welcome your comments and suggestions in order to improve our future events. Our success is only possible with your valuable feedback and support!

I hope you enjoy the conference!

With my very best wishes,

Klaus F. ZIMMERMANN
President

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Welcome to the 51st EBES Conference

We are excited to organize our 51st EBES Conference, which will take place on April 11th, 12th, and 13th, 2025, in Rome, Italy. The conference is hosted by the John Cabot University, Rome, Italy. The conference will be hybrid (with two days in person), allowing participants to join the conference in person or virtually.

We are honored to have received top-tier papers from distinguished scholars from all over the world. We regret that we were unable to accept more papers. 257 papers will be presented, and 543 colleagues from 68 countries will attend the conference. We are pleased to announce that distinguished colleagues **Valeria Costantini** from Roma Tre University, Italy; **Giovanni Dosi** from Scuola Superiore Sant'Anna, Italy; **Marco Vivarelli** from Università Cattolica del Sacro Cuore in Milano, Italy; and **Jonathan Batten** from RMIT University, Australia, will join the conference as invited keynote speakers.

Throughout the years, EBES conferences have been an intellectual hub for academic discussion. Participants have found it an excellent opportunity to present new research, exchange information, and discuss current issues. We believe our future conferences will further improve knowledge development in our fields. In addition, based on the paper's contribution to the field, the *EBES Award Committee* has selected one of the papers for the *John P. Rust Best Paper Award* sponsored by *Springer Nature*. The *Best Paper Award* winner will be announced during the conference.

On behalf of EBES, I would like to thank all presenters, participants, board members, and keynote speakers. I am looking forward to meeting you at the conference and seeing you all again at the upcoming EBES conferences.

Best regards,

Ender Demir, PhD
Conference Coordinator

SCIENTIFIC COMMITTEE

VOLUME II - CONTENTS

Brain-Drain and Skill Mismatch: Can Higher and Vocational Education Bridge the Gap?

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ABSTRACT

Objectives: This study explores how migration dynamics can shape the ability of education and training systems to address skill shortages and labor market mismatches through a unique comparative study of findings from North Macedonia, Ethiopia, and Ukraine which are considered countries of origin for migrants. Specifically, it investigates whether Higher Education Institutions (HEIs) and Vocational Education and Training (VET) providers can produce graduates whose qualifications align with the evolving economic demands, and how these institutions adapt their curricula, foster collaboration with the industry, and cope with resource constraints to mitigate skill gaps which are notably pronounced by brain-drain.

Data and Methods: Based on primary qualitative data from conducted interviews with HEIs and VETs, labor market intermediaries, and policy stakeholders, we employed a thematic content analysis to extract patterns regarding curriculum relevance, tracking of graduate employability, perceptions on the quality of education, and responsiveness to technological and structural labor market changes. Additionally, secondary data from statistical databases on migration flows and employment trends throughout the last decade contextualize the interview findings, thus providing a comparation between the four countries.

Results: Findings show that a significant share of education institutions believe their qualifications meet the labor market needs, but systematic tracking of graduate outcomes remains a challenge. Interviewees acknowledge skill mismatches since curriculum updates struggle to keep pace with the rapid organizational and technological changes. As a significant contributor towards this is also the insufficient cooperation with businesses. While many institutions attempt to update programs through stakeholder consultation or national accreditation processes, financial constraints were highlighted to limit the required improvement. Furthermore, it is generally understood that brain-drain amplifies the national labor shortages, as graduates with relatively better skill and performance often emigrate for better opportunities. Policy measures such as targeted training programs, wage subsidies, and even active labor market interventions seem to be already employed but yield mixed results across countries. Interviewees emphasize the importance of practical internships, flexibility in

learning, and modernized educational frameworks in mitigation of skill shortages and retention of domestic talent.

Conclusions: The study highlights an urgent need for reinforced institutional collaboration and robust curriculum reforms that align with global standards. Strengthening public-private partnerships, greater integration of technology as well as enhancing international cooperation particularly through EU-led frameworks appears to be essential in mitigating brain-drain and ensuring that education and training systems in the four countries respond effectively to the labor market demands.

JEL Classification: I25, J24, J61

Keywords: brain-drain, skill mismatch, migration, higher education, vocational training, labor market

1. INTRODUCTION

Labor markets worldwide are transforming rapidly due to technological advancements, demographic shifts, and evolving economic structures (Andabayeva *et al*., 2024). These changes have intensified skill shortages and mismatches, particularly in countries experiencing high levels of emigration. For many economies, the loss of skilled workers, which is also commonly referred to as brain-drain, impairs labor market imbalances, leaving critical sectors undersupplied with qualified professionals (Bongers *et al*., 2022; Vega-Muñoz *et al*., 2021). While higher education institutions (HEIs) and vocational education and training (VET) providers are expected to equip graduates with skills aligned with market demands, their capacity to do so is increasingly under scrutiny in the face of migration pressures and shifting industry needs (Cohen & Eyal, 2021). Subsequently, it is observed that the prevailing gaps in skills can often be a small part of the mosaic of reasons why an individual would want to emigrate from a certain country (Jansen *et al*., 2024; Hasselbalch, 2019). Some of the most often cited reasons include disintegrated trust in the entire system, high levels of corruption, poor public services, and similar (Van Hear *et al*., 2020).

Moreover, brain-drain is a prevalent issue in the context of global migration, affecting both countries of origin for migration and destination countries. For countries of origin, such as North Macedonia, Ethiopia, and Ukraine, the outflow of highly skilled professionals undermines national economic development as well as industrial growth (Jansen *et al*., 2024; Lapshyna & Düvell, 2015; Usman *et al*., 2022). At the same time, labor markets struggle to fill skill gaps, intensifying economic disparities and reducing productivity (Smolina *et al*., 2021). The loss of qualified individuals is particularly unfavorable to critical sectors such as healthcare, information technology, construction, and hospitality, where shortages can have a long-term negative impact on the performance of these industries and their contribution to the respective national economies (Bhardwaj & Sharma, 2023). Addressing these challenges requires re-examining education and training systems to determine whether they effectively prepare graduates to meet labor market demands while considering strategies to retain skilled workers.

In these countries of origin for migration, education and training institutions face mounting pressure to adapt their curricula, enhance their collaboration with industry stakeholders, and develop mechanisms to track graduate employability outcomes. While some institutions have attempted to reform their educational frameworks through stakeholder consultation and national accreditation processes, these efforts often fall short of mitigating skill mismatches, leaving plenty of space for improvement (Syed *et al*., 2024).

Despite the growing interest in the role of skill mismatch in emigration, most of the studies in the field have been focused on a single country or a small region. After performing a search query in the Scopus database of high-quality global research, we found a gap in the literature for a cross-country comparison of the education ecosystem in the function of reducing brain-drain effects. In other words, we believe that a unique comparison between developing countries that exist in different geographical contexts can paint a more comprehensive picture of how curricula can be designed to fit industry and labor market needs.

Our research objective is to explore how migration dynamics can shape the ability of education and training systems to address skill shortages and labor market mismatches. This is achieved through a comparative analysis of North Macedonia, Ethiopia, and Ukraine, representing countries that serve as major sources of migrant labor. Further, we examine whether HEIs and VET providers can produce graduates with qualifications that align with evolving economic demands and how these institutions update their curricula, establish industry collaborations, and navigate financial and resource limitations to mitigate skill gaps, which are further intensified by the ongoing brain-drain phenomenon. By leveraging qualitative data from semi-structured interviews with key stakeholders, including education providers, labor market intermediaries, and policymakers, which was later analyzed through a thematic content analysis approach, this research identifies patterns of curriculum adaptation, graduate employability tracking, and institutional-industry cooperation. The methodological approach is supported by quantitative analysis of secondary data from statistical databases on migration flows and employment trends throughout the last decade to contextualize the interview findings and provide a more comprehensive comparison between the countries of interest.

In more detail, the study sets out to answer two key research questions: (1) How do education and training systems in North Macedonia, Ethiopia, and Ukraine adapt to the challenges posed by brain-drain and migration, and what are the key factors influencing their effectiveness in addressing sector-specific skill shortages? (2) What roles do the outflow of skilled workers, and the influx of migrants play in shaping skill mismatches within the labor markets of North Macedonia, Ethiopia, and Ukraine, and how can education and training systems be reformed to better align with these dynamics?

Findings reveal that while HEIs and VET institutions largely believe their qualifications meet labor market needs, systematic tracking of graduate outcomes is inconsistent. Skill mismatches persist due to curriculum updates lagging technological and organizational shifts, which is additionally worsened by insufficient engagement with businesses. Additionally, financial constraints limit the ability of institutions to implement necessary reforms. As brain-drain further amplifies labor shortages, countries have adopted various policy interventions, including targeted training programs and wage subsidies, with mixed results. Hence, the study underscores the need for stronger institutional collaboration, increased public-private partnerships, and modernized educational frameworks that align with global labor market trends, highlighting the urgency of reforming education systems to ensure sustainable economic growth and workforce stability in the most affected countries, which are losing qualified workers.

Considering this, the research has significant contributions for practitioners, i.e., policymakers, decision-makers in institutions-providers of education, and business leaders, who can implement the findings into the policy discussions on the workforce and craft educational strategies and action plans that align the educational services with the needs of the industry and the labor market. The actionable insights stemming from the findings aim to enhance the responsiveness of education and training systems, ultimately leading to a more resilient labor market in the face of continued migration dynamics.

The article is structured as follows. In the next section, we elaborate on the literature on brain-drain, skill mismatches, and the responsiveness of education and training systems to labor market needs amid migration trends through a theoretical lens. Then, the article explains the methodological approach followed by an in-depth data analysis. Subsequently, in the discussion we compare the strategies and effectiveness of education and training systems across the identified countries, highlighting mutual challenges and unique contexts and ending with concluding takeaways and policy recommendations.

2. LITERATURE REVIEW

2.1. The concept and nature of brain-drain

Brain-drain refers to the emigration of educated, talented, and skilled individuals to countries with better socioeconomic conditions, driven by the desire for improved living standards, higher salaries, advanced technology, and political stability (Eyerusalem, 2016; Metin, 2023). It encompasses various forms, including physical relocation or "brain export," hidden brain-drain (working for multinational companies while staying at home), and virtual brain-drain (engaging in remote work) (Metin, 2023). Metin's classification of brain-drain patterns is observable across Ethiopia, North Macedonia, and Ukraine, albeit with differing intensities, although no comprehensive comparative study has been conducted yet (see Beyene & Tekleselassie, 2018; Breines, 2021; IOM, 2022; Schewel & Fransen, 2018).

The phenomenon of virtual brain-drain, although not well-documented in Ethiopia, potentially due to recent IT infrastructure investments, is prevalent in the other three countries. In Ukraine, the ongoing conflict with Russia has accelerated virtual brain-drain (Bucos, 2024), while in the specific context of North Macedonia, it is primarily driven by the pursuit of better pay and work conditions as indicated by some authors (Soysal & Atalan, 2024). Hidden brain-drain, prompted by limited local job opportunities and the continuous demand for skilled labor, offers prospects for local experts and allows foreign companies to secure qualified workforces across these nations (Gurel & Baykal, 2024; Semela, 2011). As the term suggests, brain-drain often results in the depletion of vital resources in the home country, regardless of its form. According to Bakirtzis, Koukos, and Sakellari (2022), brain-drain can detrimentally affect national development over time, exploiting fewer wealthy nations by diminishing their intellectual capital when individuals particularly choose not to return after their overseas experiences.

2.2. Causes and consequences of brain-drain

The Brain-drain is a complex issue with various contributing factors and significant consequences. Push factors such as poor economic conditions, limited opportunities, and political instability, alongside pull factors like better career prospects and higher wages, drive this phenomenon (Eyerusalem, 2016; Semela, 2020). Ethiopia faces a significant exodus of medical professionals due to unfavorable working conditions and better opportunities abroad (Eyerusalem, 2016; World Bank, 2023). Additionally, the ongoing war in Ukraine and internal conflict in Ethiopia exacerbate the outflow of highly demanded professionals (ILO, 2023; IOM, 2024). Factors such as educational deficits, inadequate employment opportunities, economic crises, experiences abroad, and future intentions may contribute to brain-drain (Bakirtzis, Koukos, & Sakellari, 2022), which corresponds with the Macedonian context.

Skill mismatch is another motivating factor for emigration (Beyene & Tekleselassie, 2018). Mojsoska-Blazevski (2019) categorizes mismatches in the labor market into vertical

(over- or under-education) and horizontal (misalignment of skills and qualifications) types. Vertical mismatch occurs when individuals' education or skills levels do not match job requirements, while horizontal mismatch occurs when the field of skills acquired does not correspond to the job's demands.

Factors such as macroeconomic instability, lack of employability skills, and poorly designed higher education curricula contribute to skill mismatch, particularly in Ethiopia (Beyene & Tekleselassie, 2018; Yizengaw, 2018). Teshome (2024) consolidates this assertion, indicating that Ethiopian higher education often fails to equip graduates with essential soft skills crucial in today's job market. Similarly, inadequate skills training and misalignment with future market needs contribute to skill mismatches in North Macedonia and Eastern Europe (Mojsoska-Blazevski, 2019; World Bank, 2019).

The consequences of brain-drain extend profoundly, leading to a loss of human capital and economic stagnation in source countries. It weakens education and training systems as existing staff become overloaded and face burnout (Getahun, 2006). While destination countries benefit, source nations endure knowledge spillover losses and diminished institutional capacity, exacerbating economic challenges due to the departure of sought-after talent and expertise (Metin, 2023). The consequences include lower job satisfaction, reduced wages, decreased productivity, and inefficiencies for employers due to skill gaps and higher turnover rates (Beyene & Tekleselassie, 2018; Semela & Cochrane, 2019; Teshome, 2024). The migration cycle also affects higher education and vocational education providers, diminishing student motivation amid resource constraints, thereby impacting educational quality (Fantahun, et al 2024; Yizengaw, 2018).

Migration has the other side for skilled migrants, though the main picture is the positive one. For skilled migrants, integration into host countries is challenging. They face obstacles in obtaining employment that matches their skills and qualifications due to non-recognition of credentials and language proficiency limitations (Schewel & Fransen, 2018). Discrimination, a lack of job market information, and limited access to professional networks further impede their successful employment (Beyene & Tekleselassie, 2018; Semela & Cochrane, 2019). These barriers significantly impact the ability of migrants to secure jobs that reflect their training and expertise and appropriately respond to the employers' demands in the industry.

2.3. Brain-drain and the potential for "brain-gain" or "brain circulation"

While brain-drain is typically regarded negatively, there is acknowledgment in the literature of the potential for "brain-gain," which involves leveraging the outflow of skilled individuals to generate tangible benefits (Eyerusalem, 2016). "Brain circulation" refers to skilled individuals living and working in multiple countries while contributing to their home countries through the transfer of knowledge and financial support (Eyerusalem, 2016; Getahun, 2006). The benefits of brain circulation and gain include remittances, knowledge transfer, increased personal freedoms, enhanced skills upon return, and collaborative partnerships between diaspora communities and home-country institutions (Eyerusalem, 2016).

However, the realization of brain gain is contingent upon emigrants returning to their home countries, which does not always happen. In the African context, there are distinct challenges related to resource mobilization, which make achieving the same level of success in brain circulation as other European countries difficult (Semela, 2020).

3. METHODOLOGY

In this study, we acquire primary data qualitative data from interviews conducted with three categories of respondents linked to the brain-drain and skill mismatch across the three countries i.e., North Macedonia, Ukraine, and Ethiopia. We focus on structured, open-ended

question interviews with higher education institutions (HEIs), vocational education and training (VET) institutions, policy creators involved in designing policy measures impacting the labor market and the education system as well as labor market intermediaries and social partners. Through a thematic content analysis, we obtain insights regarding the design of the educational system, curriculum relevance and suitability for labor market demands, alongside technological and labor market challenges. Additionally, through secondary data obtained from national and international statistical databases we support our theses regarding the migration flows, brain-drain, and employment trends in the recent decade, thus contextualizing the qualitative findings in a comparative manner.

Regarding the chosen higher education and vocational training institutions, the primary focus is put on public, classical universities preferably highlighting those involved in teaching specialized fields, such as medicine or technical fields. Involvement of private universities was also considered albeit their number is minimized. On the other hand, the chosen VET providers offer a multi-profile qualifications, with a focus on those specializing in the service sector programs which are considered relevant to the regional needs depending on the individual country context. Only reputable institutions showing proactive collaboration with the related industries were considered, leaving out any potentially unimpactful education providers that may provide irrelevance to the topic of interest. For the national and regional policy creators, only institutions which are directly involved in the field of education and training, employment as well as migration were deemed relevant to this study. Furthermore, interviews with the social partner organizations (e.g. trade unions, professional organizations) and labor market intermediaries (e.g. employment agencies and government bodies) as an additional group of informants were obtained. For each of the four categories of respondents the minimum sample was set to 5. However, if the specific context or the structure of the institutional aspect does not allow at least 5 representatives per category, then a standard minimum sample of 20 respondents was considered necessary for the research.

In North Macedonia the sample of interviewed institutions amounts to 20, consisted of 6 HEIs, 4 VETs, 5 policy creators, and 5 social partners and labor market intermediaries. In Ukraine, a total of 26 responses were obtained with 6 HEIs and 6 VETs being interviewed as well as 7 respondents for each of the remaining two target groups. The Ethiopian sample is consisted of 20 respondents, with 5 HEIs, 6 VETs, 5 policymakers and 4 labor marker intermediaries. Resultingly, the final sample across the three countries which we base our study upon is $n = 66$. A mixed approach was used to obtain answers i.e., through face-to-face, online interviews, and focus groups. Prior to conducting the interview an informed consent was obtained by the representatives in each institution, however due to the retention of the anonymity of our respondents this study will often refer to them as just ‘respondents’.

Figure 1 schematically presents the methodological flow in acquiring information for this study. Since each of the four groups of respondents received a different questionnaire regarding their general activities, perceptions on the labor market, offered qualifications, migration, and skill mismatches, we extract only those that strictly abide to the topic of this research. The questions were carefully designed to address how educational and training institutions perceive their effectiveness in meeting labor market demands amid migration challenges as well as focusing on the measures used to adapt to such circumstances. For the section “Relevance and fit of provided skills and qualifications to the labor market needs”, 5 questions were given to the HEIs and VETs. However, our research specifically focuses on two of them: 1) “*How would you evaluate the fit of your provided qualifications/degrees to the demand for qualifications in the local/regional, national, and international labor market? Is there any evidence (statistical data on employment, graduate tracking data) on this fit? If so, could you share with us this information?*” and 2) “*How do you update and maintain your provided training/study curricula in the context of new skills needs in the labor market caused by technological, environmental,*

organizational, and other changes? What are the key challenges and problems in the field?" In the series of questions devoted to the "Migration of graduates" our specific interest is observed in the first question i.e., "*Do you have any information about the employment and further learning pathways of your graduates who emigrate abroad? What is the share of such graduates? To what extent do they find jobs that fit the level and area of their obtained qualification?*" When considering the "Perceived role in dealing with the challenges and problems caused by migration" we are interested in finding out "*How does your institution contribute to the solution of the problems of skills shortages caused by emigration and brain-drain in your country?*"

In the case of the policy creators, we ought to find out "*How are these problems related to the supply and demand of skills and qualifications?*" when referring to the shortage of skilled workforce, structured unemployment, etc. The observe the level of national impact, we asked the interviewed policymakers "*To what extent and how is migration (emigration) a problem for the labor market and employment in your country?*" When referring to the "Labor market policy interventions", we ought to specifically find out "*What employment policy measures are applied to cope with the above-mentioned challenges and problems?*", among else.

Finally, when discussing the employment and the labor market policy context with the social partners and labor market intermediaries, we draw targeted insights when asking "*What are the roles of social partners and labor market intermediaries in solving the problems of matching the demand and supply of skills in the labor market? How do you perform these roles?*"

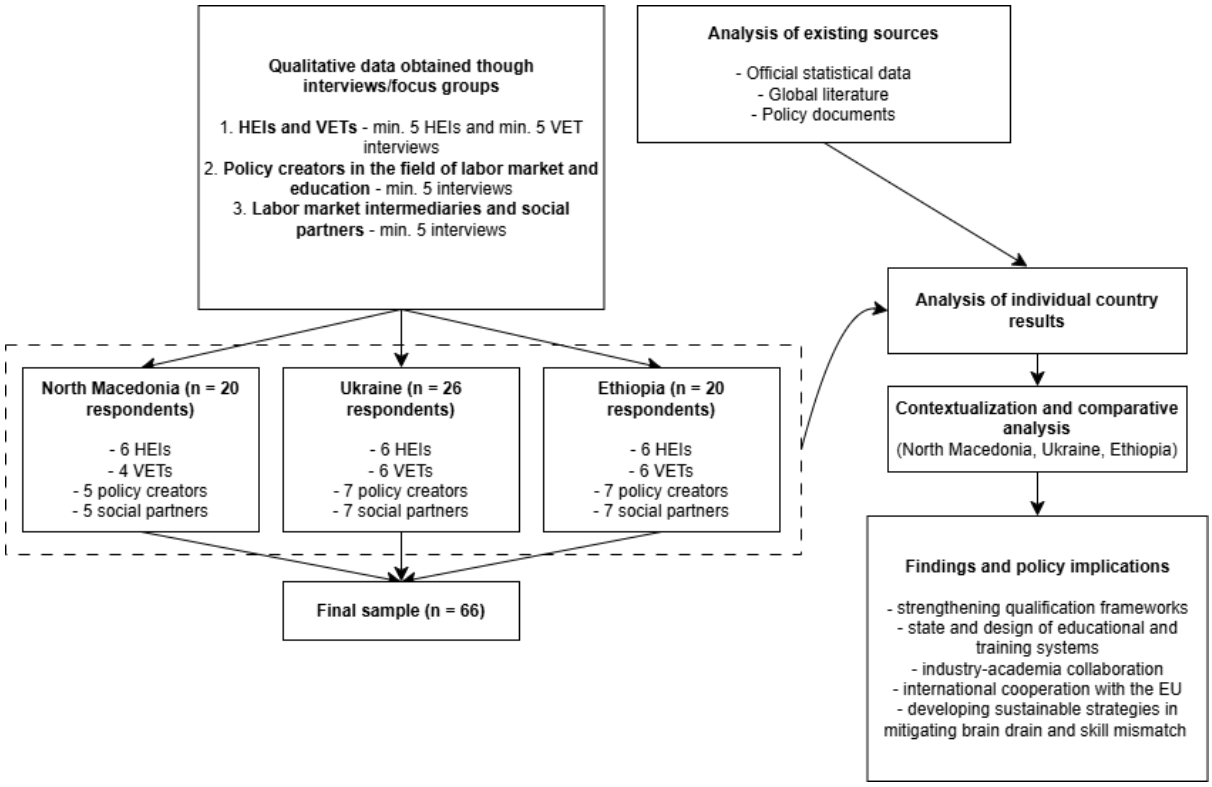

Figure 1. Methodological workflow.

4. FINDINGS

4.1. Insights from North Macedonia

4.1.1. Qualification relevance and labor market demands

Macedonian HEIs and VETs were asked to assess the relevance of their qualifications and provide supporting employment or graduate tracking data, as well as their views on how well their programs align with labor market demands. Around 70% of these educational institutions believe their programs meet both local and international workforce needs. Some highlighted their alignment with top universities, ensuring graduates acquire in-demand skills. Others note that students often secure jobs before graduation.

However, challenges persist, including outdated curricula, slow adaptation to technological advancements, and a lack of formal graduate tracking data. About 20% of respondents expressed concerns over a skills mismatch, pointing to outdated programs and an imbalance between theory and practice. The rapid growth of private universities has further complicated the higher education landscape, with some suggesting it has diluted quality. While HEIs report collaborations with businesses, VETs emphasize their strong industry ties. However, the effectiveness of these efforts requires further assessment considering evolving labor market needs.

4.1.2. Curriculum updating, collaboration with the industry and financial constraints

HEIs and VET providers in North Macedonia reported regularly updating their curricula in response to shifting labor market demands, particularly those under a more direct and strong impact from technological, environmental, and organizational changes. To keep programs relevant, they engage in ongoing dialogue with industry partners, incorporate student and alumni feedback, and undergo regular accreditation processes. However, they face significant obstacles, including rapidly advancing technology, limited financial resources, and the challenge of balancing theoretical foundations with practical application.

Some institutions have established advisory boards in collaboration with the public sector and industry to guide curriculum development, ensuring alignment with market needs and international standards. Companies frequently request specific skills such as project management, software proficiency, and statistical analysis, prompting educators to refine and adapt course offerings. While in-person instruction remains the most common, certain providers utilize hybrid learning methods to broaden skill development. Despite these efforts, respondents emphasize that financial constraints persist, underscoring the need for enhanced public and private investment in education.

4.1.3. Graduate tracking and strategies to mitigate brain-drain

Limited tracking of graduates who emigrate, and the lack of comprehensive data on their employment or further studies abroad are other aspects of insufficient brain drain mapping and analysis, which HEIs and VET providers noted. Nonetheless, informal evidence suggests these graduates often secure positions aligned with their qualifications, particularly in fields like engineering, and are valued for their expertise overseas. Institutions pinpointed the need for improved monitoring mechanisms (e.g., alumni associations) to better understand graduates' career trajectories, both domestically and internationally.

To address skill shortages caused by emigration, HEIs and VETs accented the required effort that should be made to update curricula to meet global standards, offer career development initiatives, and foster international partnerships. Strengthening relationships with local employers and establishing robust career centers are also seen as crucial strategies for retaining talent within the country.

4.1.4. Skill mismatches and the role of employment measures and intermediaries

When examining issues of skill mismatches of supply and demand, labor market intermediaries and social partners emphasized several key points. One stakeholder suggested that while North Macedonia's formal education system is strong theoretically, it falls short of practical training, thereby contributing to a shortage of workforce-ready personnel. Employers often invest considerable time and resources to train new hires, underscoring the need to integrate practical experience into education so that graduates can "start working immediately." Another concern raised was the "insufficient competence of job seekers," especially regarding digital and technological skills. The interviewed social partners also pointed to a broader technological skills gap despite the overall strong educational background of many workers.

This gap often results in prolonged job searches, with some individuals reluctant to seek further training. The interviewees similarly reflected upon a lack of alignment in VET, leading to graduates who are "not ready for employment." Additionally, they observed potential oversupply in certain academic fields, notably information technology, which additionally negatively impacts the labor market trends.

Labor market intermediaries and social partners recognized emigration as a serious challenge for North Macedonia. One interviewee noted it went largely unnoticed a decade ago due to high unemployment rates, but now the loss of skilled and experienced workers significantly undermines local industry competitiveness. Businesses face difficulties replacing emigrants or must invest heavily in training new hires, leading to drastic labor market mismatches.

Respondents underlined two main approaches to address emigration: retaining the existing workforce by assessing and upgrading their skills to match market needs or importing labor from other countries. However, foreign workers often view North Macedonia as a short-term stopover on their way to more developed European nations, limiting the effectiveness of this strategy.

In terms of employment policy measures that are applied as a direct response to brain drain, the Ministry of Labor and Social Policy's operational plan, along with the Employment Agency's strategies, were brought up as generally sound. In these strategic documents, the key measures include self-employment grants, funds pooling, subsidies for job creation, and specialized support for hiring individuals with disabilities. Some respondents highlighted training designed for specific employers, programs targeting in-demand occupations, advanced IT courses, internships, wage subsidies, tax breaks, and other employer incentives, as well as mentoring schemes and business incubators as viable solutions.

However, the results are seen as mixed. While entrepreneurship initiatives have fostered some new businesses, the broader ecosystem remains underdeveloped, especially in rural areas with limited access to markets, funding, and mentorship. Dual education and apprenticeship programs show promise in aligning vocational training with employer needs, but several respondents shed light on their perception that information about available measures fails to reach young people effectively. Only one respondent believes these policies have no positive impact at all.

Furthermore, respondents reflected upon the role of labor market intermediaries and social partners, which was identified as pivotal in bridging skill gaps. These institutions are viewed as ones that can foster communication between job seekers and employers, advise policymakers, conduct labor market research, and organize training programs. One respondent noted that social partners, often through the Economic and Social Council, meet to discuss issues such as minimum wage adjustments and to align labor supply with employer demand. Another intermediary highlighted involvement in shaping educational policies, accreditation processes, and councils to ensure training remains relevant. Employers' associations also

collaborate with government entities and educational institutions to align curricula with market needs, although some respondents worry that staffing shortages may limit these efforts.

4.2. Insights from Ukraine

4.2.1. Relevance and compliance with the labor market needs

In Ukraine, a total of 12 educational service providers were interviewed, among which 4 represented VET institutions, 2 – professional pre-higher education institutions and 6 - HEIs. They covered 8 regions of the country. The average age of functioning of the covered educational institutions was 56 years. The number of educational programs (specialties/qualifications/professions) currently offered by these educational institutions ranged from 6 to 184. The approximate number of students/pupils/listeners at these educational institutions ranged from 125 to 9,100 people. It is important that representatives of IDPs study in these educational institutions, primarily from Donetsk, Kherson, Luhansk and Mykolaiv regions.

Experts were asked to answer more than 30 questions grouped into 7 thematic blocks. The most relevant results for this study were as follows. According to the block "Relevance and compliance of the provided skills and assigned qualifications with the needs of the labor market", the interviewees assessed the compliance of the provided/assigned qualifications/degrees with the needs of the local/regional, national and international labor markets as "moderate" (57.1%) and "high" (42.9%). They confirm this by the fact that most graduates are successfully employed after completing their studies. Some VET institutions note that 70.0-90.0% of their graduate's work by profession, and at some enterprises, for example, Kryvorizka TPP, graduates always find a job. According to other data, 87.0% of graduates are employed, 64.0% of them secured their first job a year after graduation, etc.

Representatives of all educational institutions claim that their educational standards and curricula are regularly updated and adapted in accordance with state requirements, regional needs and changes in the labor market caused by technological, environmental, organizational changes and martial law. Advanced training courses are being implemented, for partial qualifications, educational programs are being revised considering the needs of employers in wartime conditions. Employees of educational institutions participate in the development and discussion of new standards. Educational programs are updated on a scheduled basis once every two years or unscheduled, considering the current needs of the labor market and society.

4.2.2. Main challenges and problems in demand and supply matching

The interviewees also indicate that the main challenges and problems include: the lack of a general indicative educational program for some qualifications/professions, difficulties with passing working practice at enterprises, the state of war, as well as the lack of funding for training for partial qualifications, which complicates practical training and does not provide remuneration for teachers, masters of working training.

The respondents assessed the general situation with the matching of demand and supply for the qualifications of VET institutions/professional pre-higher education institutions/HEIs in the national, regional and local labor markets as "moderate" (71.4%) and "high" (28.6%). Among the main reasons for the existing mismatch of skills, they single out: the military situation in Ukraine; special characteristics of pupils/students; a large variety of equipment at various enterprises, and the outdated material and technical base of the educational institution, etc. To reduce or eliminate this discrepancy, it is necessary to license and introduce new professions, simplify the licensing procedure, and update the material and technical base at the expense of financial infusions, primarily from stakeholders.

4.2.3. The role of education institutions in overcoming skill shortages

According to the block "The role of educational institutions in overcoming the lack of skills, in particular, caused by labor migration, the outflow of teachers from the borders of the region or the country", the interviewees note that educational institutions contribute to overcoming the lack of skills by conducting individual consultations, involving pupils/students to work in technical creativity clubs, participation in master classes and STEM education. Teachers and masters of working training constantly undergo internships at enterprises and improve their qualifications, through participation in international projects and grant programs. Young specialists and other employees of enterprises are also involved in the educational process.

Solving the raised problem is not a difficult technology for experts. Today, they can provide scientific and pedagogical workers with internship opportunities both within the state and abroad through advanced training, educational tours, exchange of experience and various areas of cooperation. Educational institutions should have corporate values and aspirations to improve the skills of not only students, but also the teaching segment, which is related to self-study, self-improvement of teachers, increasing their competences by considering teaching activities, innovations, digitization processes, attracting the possibilities of artificial intelligence, modern teaching methods, etc.

4.2.4. Policy, education authorities and international cooperation

According to the block "Using comparison tools and the possibility of transferring skills and qualifications", the majority (71.4%) of the represented educational institutions apply the norms and provisions of the National Qualifications Framework (NQF) in their practical activities. At the same time, only 42.9% of respondents indicated that they use NQF for recognition, comparison and validation of qualifications. In general, 57.0% of respondents give a low or moderate assessment of the potential of the NQF. Most of them note that the NQF does not help in any way in recognizing the educational level of foreign pupils/students who apply for studies. 71.4% of respondents do not use EU tools such as ESCO, Europass, etc. to ensure the visibility and transparency of their qualifications in the national qualifications system and abroad.

According to the last block "The need for support of educational institutions for the development of partnerships with other countries", experts indicate the most urgent need for the provision of quality educational services in the future for such resources as: human (lack of qualified personnel), material (partially outdated material and technical base), and financial. Among the priority components/expenditures that will most require investment and support in the post-war reconstruction period of Ukraine, educational institutions identified: equipment and more opportunities for self-education, for participation in international grant projects; restoration or formation of the institution's infrastructure; training of teachers and development of their new competencies; development of new educational programs.

All respondents are interested in cooperation with providers of educational services from other countries (non-EU members), whose citizens will potentially come to Ukraine during its post-war reconstruction. They see the priority areas of such cooperation as: exchange of experience; investment attraction; organization and implementation of joint international research projects; development of dual education and adult education; differentiation of the educational process; provision of services for training and retraining of qualified employees.

To study the opinions of representatives of central and regional authorities responsible for policy in the field of education, skill formation and qualifications, anonymous interviews were conducted with representatives of the National Qualifications Agency, the Ministry of Education and Science of Ukraine, the Ukrainian Union of Industrialists and Entrepreneurs, and the regional body for methodological support of VET institutions.

To the question: ‘What are the most priority tasks related to balancing the demand and supply of skills and qualifications in Ukraine?’ respondents expressed themselves with the following key aspects: labor market statistics are necessary in dynamics; it is important for the education system to promptly respond to the needs of employers in terms of qualifications, new skills and abilities; the expediency of defining professional standards by the main developer with the participation of employers' educators, their participation in the development of educational programs, work curricula; rapid transition of Ukraine to professional standards; cooperation and communication of employers and the field of education at the level of a specific subject of educational activity and enterprise, mutual and constant search for counterparties; completeness, openness and availability of information about the needs of the labor market on the one hand, and on the other hand, opportunities in the field of education.

4.2.5. Disparities and impact of migration

Among the sectors of the economy where the highest discrepancy in the qualifications of employees was identified, the interviewees identified the following: mechanical engineering; electronics; health care. The reasons for this discrepancy are: low quality of educational services; professional education is removed from technological processes at enterprises due to the absence of legal regulations that would regulate it; knowledge-intensive and technological types of economic activity require large costs over a long period of time, and the result (return, economic effect, opportunities for obtaining profits) is prolonged in time, not always obvious and not always expressed in financial and material dimensions.

The majority of respondents believe that in Ukraine it is obvious that employers and the economy are oriented towards their requirements for qualifications due to the development of professional standards (as of September 1, 2024, 350 are in force and about 400 projects are being developed), qualification centers (as of the specified date – 115), where about 3,000 applicants of professional qualifications underwent independent evaluation, recognition of the results of non-formal and informal education, etc.

Regarding gender disparities in the relevant field, the interviewees agree that the acute shortage of labor force during the war accelerates the blurring of the gender characteristics of certain professions and contributes to the elimination of gender imbalance, where it could be. Among the sectors of the economy where certain gender problems are most present, individual respondents single out: metallurgy, coal and chemical industry, road construction, humanitarian demining, etc. Regarding the impact of foreign labor migration on the current practice and policy in the field of education and training, the interviewees note its absence in wartime conditions. But in the future, when the period of post-war reconstruction will come, Ukraine should consider the practices of EU countries and develop its own strategy when attracting labor from outside.

Among the problems created by the regional movement of IDPs for the Ukrainian system of education and qualifications, the respondents pointed to the following: the quality of training is deteriorating due to the mass false admission to training of persons who avoid service in the Armed Forces; there are no legislative and normative documents that would determine the role and rights of the regional government to use its own resources (financial, material) regarding the continuation of the education of IDPs, the education of citizens from other territories in educational institutions, etc.

4.3. Insights from Ethiopia

4.3.1. Fitness of degrees or qualifications in the labor markets

All HE (5) and VET (6) providers interviewed reported that they are aware of and strive to align their academic programs and qualifications with labor market demands. HE providers in Ethiopia are demanded by proclamation to prove the relevance of their study programs to local, national, and international labor market demands. In response, all participants we interviewed from HE institutions provided concrete evidence for the fitness of their programs to the three levels mentioned. For example, one of the HE leaders interviewed witnessed the relevance of their qualification to the local, national, and international demands by mentioning that his university is *benefiting at least one member from each household through employment, community engagement, or research outputs;* exemplar in meeting national demands through its *textile engineering and* responding to the international market by *training maritime engineering to international standards.*

In contrast, VET providers focus on aligning their programs and qualifications with national and local needs due to policy constraints. All VET leaders interviewed anonymously agreed that their curricula and exit examinations are developed at the provincial or national level, based on skills gaps identified by local and national labor market demands. As one interviewee noted, *«All programs we have are those identified by the government as relevant to labor market demands. Normally, the government looks at the gaps in government organizations* and develops training programs with the assumption that it is these organizations who will absorb the graduates.

4.3.2. Maintaining and updating provided training and related challenges

Conducting needs assessment and reviewing curricula as per the gap indicated is one of the strategies all the 11 leaders of training providers claimed to do. However, both the training providers themselves and social partners and intermediaries who participated in the study noted that HE and VET providers are struggling to keep pace with the rapidly changing environment and technological advancements. For example, one of the HE leaders interviewed witnessed that inadequate adaptation of curricula and training to modern construction industry standards has resulted in *civil engineering graduates facing unemployment.*

Furthermore, HE and VET providers, along with social partners and intermediaries involved in the study, highlighted the fundamental challenges in equipping graduates with market-relevant skills, a major factor contributing to the current skills mismatch. For illustration, one of the social intermediaries interviewed said," *The current graduates fall short of demonstrating competencies required of their qualifications; hence,* they *failed to secure decent job".* On the other hand, one of the social partners claimed that *"the existing national market failed to create decent jobs and as a result, best minds are migrating abroad in search of better job opportunities while the others are forced to work under capacity".*

4.3.3. Graduates' employability and learning paths

The absence of a modernized graduate information management system at both the national and institutional levels has hindered HE and TVET providers in Ethiopia from systematically tracking their graduates to obtain timely and accurate information about their whereabouts, employability, and progression to higher-level training. This lack of an information management system also complicates efforts to balance labor market demand and supply, thereby affecting decisions related to the expansion of training provisions.

4.3.4. Responses of institutions to the challenge caused by emigration and brain-drain

Participants of the study viewed migration positively as it supports skilled workers getting better employment opportunities and supporting family members back home as well as contributing to the national economy. In support of this notion, Gidey (2023) claims that as the number of Ethiopians migrating abroad increases, international remittance flows to Ethiopia increase, remain stable, and support the national economy than foreign direct investment. Ethiopian migration policy has evolved from negative to positive, recognizing the potential economic benefits of emigration and efforts to reduce the unemployment rate among young graduates from higher education (Wieser, Makonnen, Cardona-Sosa, and Abubakar, 2022). The shift in migration policy is seen in the recent government's attempt to "*map international market demands for skilled workers and re-tooling graduates according to international market demand*", as one of the participants noted.

However, intellectual flight in the form of brain-drain is seriously affecting the local industries including universities and vocational Education where workers with higher level education and with advanced technical and technological skills are leaving the country. The issue is critical when someone sees "*all the young and senior physicians preparing to leave their home institution"*, one of the interviewees noted.

HE and VET providers are responding and planning to respond in various ways. Firstly, they aim to increase their intake capacity, if human, material, and financial resources can be secured. To achieve this, they are working with local and international partners, engaging in the co-creation of curricula, teaching, assessment, and co-financing of training as plausible strategies to address the challenge. Additionally, they plan to trace, network and involve the diaspora in curriculum development, teaching, mentoring, research, and assessment as other strategies.

5. DISCUSSION

To solve the problem of the brain-drain and skill mismatches the three countries use somewhat common strategies that differ due to specific problems faced by them. In North Macedonia, to fight mismatches of skills, educational institutions are actively updating and maintaining their curricula to align with the evolving needs of the labor market. Through close collaboration with industry partners, regular accreditation processes, incorporation of student and alumni feedback, and engagement in professional development, they strive to equip their students with the proper mix of relevant and needed qualifications. The most demanding challenges to overcome are the rapid technological change, financial limitations, and balancing theoretical and practical components. To facilitate the process, the companies tend to communicate specific skill requirements, such as proficiency in project management, software usage, management, and statistics, and thus influencing curriculum development. Some of the educational institutions have already established boards for cooperation with public entities and industry partners, utilizing continuous dialogue about curriculum relevance and necessary updates.

As for the specialized professional training, VETs indicate that certain programs have been developed to fill gaps not covered by traditional faculties, such as management of sales facilities in retail and practical training for export sectors. They also recommend implementing training on big data, human resource management, project management, and artificial intelligence to address technological advancements and organizational needs. Most educational institutions actively collaborate with local companies and employers' organizations to align their qualifications and skills with industry demands, as stated multiple times previously.

Most education and training institutions in North Macedonia report that they have not observed significant gender-specific skill gaps within their programs. While some

acknowledge existing gender imbalances in certain fields, efforts to address these gaps vary. A few institutions have implemented initiatives to promote gender diversity, particularly in areas where women are underrepresented.

It was noted that educational institutions in North Macedonia need to have better infrastructure, modern facilities, and updated equipment to improve training quality and align graduates' skills with market demands. Staffing is another priority. Institutions need to simplify hiring procedures to lower workloads and facilitate retaining talent. They plan to have teacher training in practical and digital skills, updated curricula aligned with current market needs, and events that foster student community and networking.

One of the essential strategies to slow the brain-drain is the international cooperation, especially with EU institutions, involving the exchange of expertise, joint research opportunities, and access to European funding. VET providers should develop program exchanges, student mobility, and business links to adopt the continuous education culture prevalent in EU countries and ultimately improve educational and industry practices in North Macedonia. The primary challenge was the brain-drain of educated and skilled labor as they left the chain of the skills transfer. The most serious issue to overcome here is the fact that emigration in North Macedonia seems to not be driven solely by economic factors but also by political and legal issues.

Despite acknowledging the theoretical benefits of migration—such as increased financial, human, and social capital, it was noted that these gains remain unrealized in North Macedonia due to low levels of return migration. While some believe circular migration could bring valuable expertise back, evidence suggests most expatriates remain abroad long-term. Internal migration within the country partially alleviates labor shortages in certain regions but diminishes economic activities where the workforce departs. Overall, potential advantages are limited, as people tend to leave permanently rather than return, resulting in a minimal positive impact on the national economy. North Macedonia's National Qualifications Framework (NQF) and related instruments show limited use in some public institutions due to legal constraints, but they still have their potential benefits. Alignment with the European Qualifications Framework improves recognition of domestic qualifications abroad, facilitating both horizontal and vertical mobility and bridging gaps between educational outcomes and labor market needs. However, their impact on sustainable migration and reversing brain-drain remains modest, with returnees facing persistent challenges. Labor market intermediaries and social partners in North Macedonia collectively recognize the significant potential of the National Qualifications Framework (NQF) and related instruments in addressing the mismatch between supply and demand of qualifications and influencing migration patterns of the skilled workforce. The NQF is seen as a critical tool for ensuring that educational outcomes meet the requirements of employers, potentially reducing skill mismatches.

In Ukraine, the situation is complicated by the war as it completely changed the structure of demand for skills and qualifications, created demand for new skills needed for defense sector that require the creation of new education programs. Most of the data for the specialized military training is classified but the vast destruction of infrastructure increased the demand for qualifications that were not among the most demanded before the war. On the other hand, it almost eliminated the gender discrimination among employees as there is distinct shortage of male workforce in civilian professions. The new sought-after educational programs include obtaining professions of electricians of power networks, tilers, plasterers, as well as short-term certification courses for electricians in the repair and maintenance of electrical equipment. Programs have also been already developed for workers in complex maintenance and repair of buildings, cooks and mechanics in the repair of agricultural machines. In addition, certificate programs such as "Current geopolitics and problems of international relations", "Social policy

for the protection of the population during martial law", "Green energy", "Military social work", etc. appeared in the field of non-formal education.

The strategy to overcome the effects of the brain-drain in Ukraine include active cooperation with local companies or employers' organizations to improve the relevance of the provided qualifications to the requirements of employers. The main forms of such cooperation are:

1. Working training and practice, internship: Apprentices/students could practice and consolidate labor techniques and skills at real workplaces.

2. Joint events: Organization and holding of Open Days, joint meetings, round tables, master classes, seminars-workshops for familiarization with modern technologies and their implementation.

3. Participation in projects: Cooperation within the framework of various projects, such as, for example, "New Factory-2" and "New Factory-3", which are implemented at the ArcelorMittal Kryvyi Rih enterprise.

4. Internship of pedagogical and research-pedagogical workers: Teachers undergo internships at production plants to familiarize themselves with new technologies and their introduction to the educational process.

5. Joint webinars and mini-fairs of professions: Conducting webinars on the study of new production technologies and organizing mini-fairs of professions based on professional career centers.

6. Participation of employers in the development of educational programs: Managers, representatives of business and public organizations participate in the development and review of educational programs, discussion of changes and updates. They also teach certain professional disciplines.

7. Organization of joint projects and research: Employers and educational institutions co-organize projects, research, scientific conferences, seminars and round tables.

8. Management of qualification thesis: Employers act as reviewers and manage the writing of qualification thesis of learners, forming in them the skills and competencies needed in the modern labor market.

The high level of employability of graduates is achieved because they expand their opportunities due to additional competencies acquired during their studies. Educators actively introduce new production technologies into the educational process, adapt work curricula for a deeper study of innovative production technologies. This allows graduates to be better prepared for the requirements of the modern labor market. Practical training at the stakeholders' enterprises enables learners to demonstrate their skills, knowledge and professionalism, which often attracts the attention of employers. In many cases, after the internship, graduates receive offers of employment in these institutions. In addition, former graduates, who have already become successful professionals, often become stakeholders in the educational programs at which they themselves studied. They value the professional training and skills that are formed during training and have an interest in cooperation or in involving specialists of a certain specialty.

The policy makers and social partners in Ukraine consider the formation of the practice of qualitative assessment and the assignment of professional qualifications; use of the existing VET institutions network, proven forms of training, personnel and material resources; implementation of directions for the development of professional standards, creation and maintenance of the activity of qualification centers, as the most effective strategies to eliminate skill mismatches. To overcome this situation, they recommend to implement such measures as prevention of the assignment of professional qualifications without proper accreditation of business entities; creation of a network of professional education centers with the possibility of providing graduates with the 4-5 level of the NQF; comparison of the NQF with the

European Qualifications Framework, which will simplify the recognition of Ukrainian qualifications in EU countries, and European qualifications in Ukraine.

Among the potentially fruitful areas of cooperation with politicians and institutions of the EU and its member states in the search for sustainable and mutually beneficial development of education and training for Ukraine and the EU, the following should be noted: to spread the technologies and practice of quality assessment of learning outcomes at all levels; introduce state regulation of certain important professions in accordance with the EU requirements; spread international projects, introduce grants to meet the needs of the material base of the educational process for IDPs and migrants; to develop the NQS, in particular, in the matters of comparison of the NQF and the EQF, the development of the Unified Register of Qualifications, the development of professional standards and advisory support for integration into the pan-European qualification space; jointly develop the direction of adult education.

Among the support from the EU, necessary for the development of personnel training and skill formation in war and post-war times, experts highlighted: the introduction of modern learning technologies and evaluation of learning results, first of all for such fields of knowledge as engineering, health care and agronomy; formation of a quality system of accreditation of educational programs and educational institutions; assistance in the development of educational programs in terms of taking into account the requirements of professional standards in the training of specialists; investing in the development of professional standards; financial support for the organization of processes of qualification improvement and re-qualification; renewal of the material base of educational institutions (scientific, technological), taking into account innovative standards for energy efficiency and energy independence.

The situation in Ethiopia is somewhat different. As all the educational programs and curriculum are developed in cooperation with the government, they are considered relevant and match the local and national labor market demands. As that programs primarily address the needs of the local economy, internationalization of curricula contents and instructional approach is not considered a priority. However, training providers were unable to provide evidence regarding the relevance and effectiveness of their programs in terms of graduates' employability. The significance of the qualifications offered is closely tied to the availability of employment opportunities and the employability of graduates. Some of the educational institutions even reported that their graduates secure employment opportunities even before graduation. On the other hand, there are several challenges to the brain-drain prevention such as the trend of accessing employment through social networks rather than competencies, a lack of self-reliant companies to accommodate internships, a lack of companies to absorb graduates, pedagogy used by trainers, and HE and VET graduates lacking the requisite skills and knowledge to meet labor market demands.

It is noted that the education institutions consider the establishment of an efficient dialogue with the employer as a must to improve curricular and skills obtained. For graduates to acquire the necessary skills and work culture, companies must acknowledge their role by providing practical opportunities and allowing trainees to learn through hands-on tasks under the guidance of company experts. Without this collaborative effort, expecting graduates to possess the required skills is unrealistic. On the other hand, as the curricula and related Occupational Standards are developed centrally and distributed to colleges for implementation, it allows for the swift exclusion of outdated curricula and supports the emergence or continuation of programs that meet market needs. It means that the HEIs and VET providers are somewhat limited in their autonomy to change curricular based on the feedback from the labor market. Five key factors emerged as challenges in adapting to changes brought about by technology and environmental shifts. Lack of consistently applying tracer study, lack of access to state-of-the-art content and technology in curricula and teaching, theory-dominated traditional teaching approach, gaps in integrating technology in the learning process, and

limitations in equipping graduates with technical and transferable or soft skills are common factors that emerged as a challenge.

One of the challenges to overcome in Ethiopia is a positive gender discrimination policy for admissions to higher education, program placement, and recruitment. The universities and TVET colleges are still facing challenges in closing gender gaps, particularly in programs focused on hard skills. One of the proposed strategies to fill the gap caused by the brain-drain is to increase the intake capacity of educational institutions which leads to producing quality graduates in quantity, so that the country can be easily compensated for the gap that would be created by brain-drain.

As all policymakers and social partners who participated in the study agreed on the existence of an unbalanced demand and supply of skilled labor force in the current market economy, it was highlighted as a critical challenge for the nation. There is a surplus supply of graduates in the field with less demand. This automatically leads to unemployment and underemployment. Conversely, in some areas, industries struggle to find suitable applicants, resulting in increased costs for companies that need to recruit experts from abroad using hard currency or make additional investments in capacity building. It is considered that the gaps in understanding industries' needs by HE providers have contributed to the current imbalance between demand and supply. HE providers have conducted superficial needs assessments, resulting in graduates with knowledge and skills that are not in demand. Furthermore, the lack of differentiation among programs and institutions nationwide allows all public universities to produce similar graduates through standard curricula and systems, resulting in a homogeneous skill set among graduates, regardless of whether these skills are desired or not. The policymakers offered the following strategies to improve the quality of education obtained:

1. *Developing graduates to fit in with the international market*. Upskilling is required due to the observed skills mismatch between graduates' profiles and the skills demanded by the international labor market.
2. *Placing strong quality assurance mechanisms ranging from curriculum development to graduation*. Only competent secondary school completers are allowed to enter HE and VET. The number of entrants has substantially decreased since 2022, with the hope that it will increase once key stakeholders understand and prioritize quality over merely counting the number of years and trainees. Finally, all graduates are required to pass an exit assessment designed to evaluate the development of the minimum competencies required.
3. *Differentiated higher education system*. Higher Education Institutions (HEIs) are currently undergoing reforms, with each institution designated as either a Research-Intensive, Comprehensive, or Applied Science University, focusing on specific areas of specialization. Among them, fifteen universities have been categorized as Applied Science universities, shifting their curricula and pedagogies to better align with labor market demands.
4. *A move towards program accreditation*. The current move towards national and international accreditation of programs is expected to transform the relevance and quality of graduates to the local and international market. Federal Education and Training Agency established as an independent entity to oversee the implementation of program accreditation.

As a result, it is obvious that the skills mismatch due to the brain-drain is present in all three countries but the strategies to overcome it differ greatly. It is explained by the varying initial conditions. In North Macedonia and Ukraine, the reasons for brain-drain are not purely economic so the improvement in the quality of education can only mitigate it. On the other hand, their educational programs are rather flexible and are developed in concert with the employers. In Ethiopia, the curricula are very much inflexible and uniform across the country so the cooperation with employers is minimal and very formalized. More so, there is a distinct lack of applicants for professional and higher education. It means that the most common strategy in all three cases should be the development of new joint programs with employers to

guarantee the employment to their graduates to ensure high income for skilled workforce. It will prevent their migration due to economic reasons leaving only social and security factors to mitigate.

6. CONCLUSION

The intertwined issues of brain-drain, skill mismatch, and migration have significant impacts on Ethiopia, North Macedonia, and Ukraine. The study highlights the complex interplay between migration dynamics, education systems, and labor market needs with their subsequent impact on brain-drain aspects. By examining how higher education and vocational education and training systems adapt (and even fail) to the constantly evolving labor market demands and emigration, the conducted research fills an academic gap in understanding how policy measures alongside institutional strategies deal with the identified skill mismatches and the resulting brain-drain. Even despite the varying socio-economic contexts, all three countries portray evident skill shortages exacerbated by the emigration of qualified personnel, commonly known as brain-drain. The findings reveal that even though Higher Education Institutions (HEIs) and Vocational Education and Training (VET) providers tend to align their curricula with the demands of industries mainly through industry consultations, accreditation processes, and curriculum reforms, rapid technological advances and financial constraints are some of the main inhibitors to the success of this process. Moreover, inefficient collaboration with the employers and the practically non-existent graduate-tracking systems in some cases further undermine efforts to supply highly demanded labor skills across the three countries.

Simultaneously, we find that policy interventions show mixed success among countries. Although North Macedonia, Ethiopia, and Ukraine already employ measures such as targeted training and wage subsidies, they seem to have a limited impact, indicating that lasting solutions require structural changes. In that context, strengthened public-private partnerships, greater emphasis on international cooperation, and efficient accreditation processes emerge as critical for bridging gaps and retaining domestic talents. However, substantial changes cannot be achieved without addressing the core drivers of emigration. By adopting a collaborative approach that creates synergy between policy creators, educational institutions, and industry stakeholders, these countries that are considered originators of migration can more effectively align human capital formation with market requirements. Consequently, this should in turn mitigate both the current skill mismatches and the long-term negative impact of brain-drain. While acknowledging the relatively small sample sizes in each of the three countries, future research should therefore be focused on incorporating more robust quantitative indicators of graduate outcomes while investigating cross-border policy harmonization that hinders brain-drain pressures while supporting the international portability of skills and qualifications.

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