LELAM-TVET4INCOME ETH zürich DMTEC Chair of Education Systems

LELAM-TVET4INCOME: Synthesis of results from the first phase of the project

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Contents

List of tables

List of figures

1. Introduction

The LELAM-TVET4income project[1] responds to a gap in knowledge about the link between Technical Vocational Education and Training (TVET) and the labor market, and how TVET affects employment opportunities and quality for youth in low and middle-income countries. Case studies and project partner institutions in Benin, Chile, Costa Rica and Nepal, which differ widely in culture and stages of economic development, allow for analysis of education-employment linkage and youth labor market paradigms across a variety of contexts. Moreover, reforms, interventions and implementations in each of the four countries permit impact assessment and experimental and quasi-experimental research. The project is driven by a key question that underpins this research agenda: *Under what conditions can Technical Vocational Education and Training (TVET) improve the income of the youth?* In order to provide answers to this question, the project has developed four targeted research questions. These questions provide a concrete framework for the overarching question, by defining the actors in the education and employment systems, measuring institutional linkages and labor market outcomes, and assessing the quality of education and employment systems, their linkages, and how they can be improved:

1. How can we define and measure social institutions of TVET?
2. How can we measure the youth labor market situation in low and middle income countries?
3. Does improving the linkage between the actors of the education and employment system reduce unemployment, improve gainful employment, job quality, and thus income of the youth?
4. How can the implementation and continuation of systemic changes in TVET be enhanced?

The first phase of the project (2017-2020) has seen important research activity related to each of these four research questions. The purpose of this paper is to provide an overview and synthesis of this research activity. We do so by documenting the research output related to each of the four questions, indicating how this research contributes to answering the driving question of the project. The key achievements of the first phase of the project have been the development of a theoretical framework to measure the social institutions of TVET, indices that capture the extent and quality of institutional linkages and youth labor market situations, and assessments of system linkages and effectiveness of new reforms and programs in the partner countries. We also discuss how this knowledge generation and development of measurement tools make a broader contribution to the TVET policy and practice. Finally, we outline in which areas the second phase of the project (2020-2023) will focus to develop further contributions to research and policy for TVET to have a higher impact on the livelihoods of the youth.

[1] Research partners of the project are the following six groups: Chair of Education Systems, ETH Zürich, Faculty of Agronomic Sciences, University of Abomey-Calavi, Benin, Agronomic Faculty, University of Parakou, Benin, School of Economics and Business, Alberto Hurtado University, Chile, Institute of Education Research, Faculty of Education, University of Costa Rica, NADEL Center for Development and Cooperation, ETH Zürich, Kathmandu University School of Education, Nepal. More information on this project can be found on its website: https://r4d.tvet4income.ethz.ch/

2. How can we define and measure social institutions of TVET?

The first question of the research project seeks to apply the framework of social institutions to the TVET context. This addresses the overarching research question by providing a systematic method for understanding the different institutions within and around TVET systems, in order to subsequently be able to better answer questions concerning the conditions under which TVET is best positioned to make a positive impact on youth labor market outcomes.

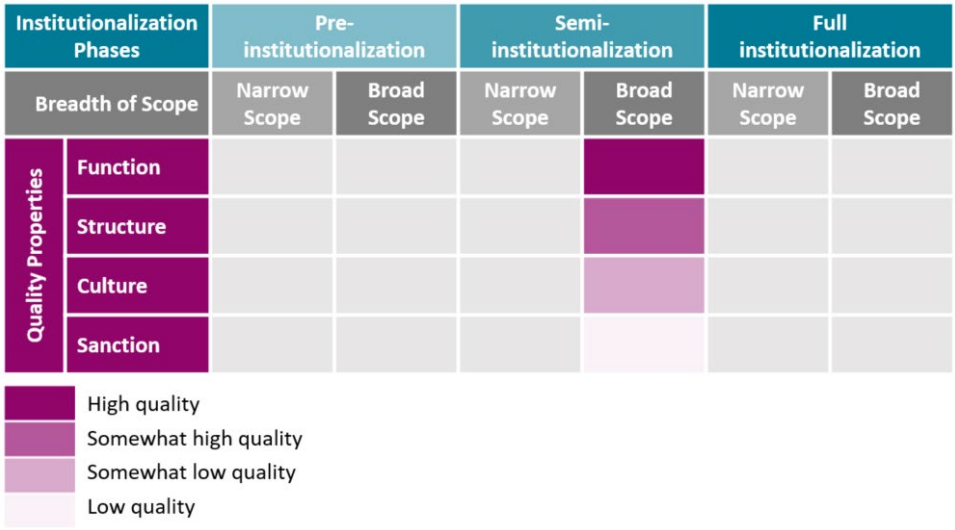
2.1 Defining social institutions and their role in TVET

For a TVET program to successfully improve youth labor markets, job quality, and income, it needs to serve specific functions, such as setting qualification standards, matching students to training places, and organizing resources and materials (Rageth & Renold, 2019). The social institutions of TVET provide the key mechanisms that facilitate these functions, as, in their strongest form, they provide a stable, well-recognized and trusted context for the development and implementation of education programs and education-employer links. Defining social institutions and providing a means of measuring their efficacy and robustness, is therefore an integral contribution to the project. Work on this topic by Renold, Caves, Rageth and Bürgi (2019), which has been developed further since, provides a basis for these definitions and measurements.

Social institutions can be broadly defined as *relatively stable patterns of behavior or joint action that help overcome fundamental problems in society*. However, as noted by Abrutyn (2014), contemporary institutional scientists use the term in ambiguous and even colloquial ways without properly defining it. We define institutions as *meso-level entities that exist within institutional fields, organizing common patterns of behavior towards some purpose*. We use the term *"robust"* to describe *theoretically ideal, long-lasting, or otherwise strong institutions*, and suggest a literature-based framework that captures the dimensions of institutional robustness. Figure 1 summarizes the three-dimensional framework.

It is not always useful to compare TVET programs across contexts by comparing the same group of institutions because different social institutions carry out the same functions in different societies. Therefore, a more appropriate method of comparison is to identify the social institutions carrying out equivalent functions, assess their robustness, and use that assessment to compare TVET programs' robustness: their strength, longevity, and relevance to those they serve. To that end, we develop a theory-based framework that assesses the robustness of social institutions in any field, which we then apply to TVET specifically.

Figure 1. Theoretical framework of social institutions (illustration)



Note: Location (all four properties/rows) is determined by institutionalization level and scope. The properties of the quality dimension are colored according to robustness, from white (not robust) to dark magenta (very robust).

The first dimension is the *degree of institutionalization* (Berger and Luckmann 1967, Tolbert and Zucker 1999, Turner 2010). This dimension describes the process of institutionalization and development of institutional structures. As institutions move through institutionalization levels, their common patterns of behavior stabilize and become more persistent over time. Social institutions gain stability and power to determine behavior as they progress through the institutionalization process (Tolbert and Zucker 1999). We make our first proposition for this dimension:
Proposition 1: A social institution is more robust as it advances through the institutionalization process.

The second dimension of institutional robustness is the *institution's scope* (Goffman 1961, Jepperson 1991, Leslie and Clunan 2011). We differentiate between narrow and broad scope in social institutions. Narrow institutions are small or low-density, representing a smaller part of their possible jurisdictions. Broad institutions are large or widely adopted, representing a bigger part of their possible jurisdictions. An institution that fills its niche is more robust than one competing with others in the same niche, and a larger institution is more robust than a smaller one. Thus our proposition on the social institution's scope is:
Proposition 2: A social institution is more robust when it is broader in scope.

The third dimension is a quality dimension that includes four properties defining *institutional quality* (Miller 2019, Scott 2008, Abrutyn 2009 & 2016, Parsons 1940). The four properties are function, structure, culture, and sanction. We make propositions for each property specifically, and all of those feed into the proposition for this dimension:
Proposition 3: A social institution is more robust when its quality is higher in all four properties of the quality dimension—function, structure, culture, and sanctions.

Finally, following Abrutyn (2014), we relate the dimensions to one another as interconnected rather than independent variables. Therefore, we also make the following proposition for robust social institutions:
Proposition 4: A robust social institution is robust in every dimension of the framework: it is fully institutionalized, broad in scope, and has high quality in all four properties. A weak element in any dimension makes for a weaker institution.

Based on this theoretical framework and further field-specific theory, we developed a methodological approach for comparing and measuring TVET programs, based on the Curriculum Value Chain (CVC; Rageth and Renold 2019) and expert evaluations of the importance of curriculum setting, implementation and feedback processes. This framework will be tested in the partner countries in the second phase of the LELAM project, and enables us to meaningfully compare across social institutions with equivalent functions in the same institutional field. Therefore, we will be able to compare not only the outcomes or single characteristics of TVET programs, but also how robust the social institutions are that carry out their key functions.

2.2 Identifying and mapping TVET institutions in the partner countries

A better understanding of the institutions that underpin TVET programs is vital to understanding the conditions under which TVET can reduce unemployment, improve employment, quality of work and income of youth. Such institutions are shaped by cultural conditions, which can be seen, for example, in the behavior of the actors or in structural characteristics. Identifying the similarities and differences between such institutions is a prerequisite for understanding why TVET programs work or not.

Therefore, one of the principal tasks of the LELAM project in the early phase was to gain a deeper understanding of institutions governing and otherwise implicated in the TVET systems of the four partner countries. This step is vital in being able to provide a full assessment of TVET systems prior to any possible intervention that would modify the system. Moreover, it served as an opportunity to validate the hypothesis of Renold et al. (2019) that while the social institutions of TVET may differ by country context, they essentially cover the same roles in their respective systems. We mapped the different institutions in each of the systems. Based on the output so far, we present here an overview of the institutions of TVET based on the actors who offer vocational education and training, the level of and differences in formalization and certification of TVET programs, and the interaction between TVET institutions.

The TVET systems in the LELAM partner countries are all characterized by a multitude of providers and training options, though the nature of these providers and their training opportunities differs. School-based programs are a feature of formal TVET in all countries, and generally focus on theoretical skills. In some cases, these are dedicated institutions – the Professional Technical Colleges in Costa Rica, Technical Schools in Nepal, and Benin's Technical High Schools. Dual-education programs are also present in all partner countries, though again these differ both between countries in terms of their scope and reach, and within countries, such as in Chile, with distinct programs for Traditional Professional Technical Secondary Education (EMTP-T), where school and work-based training are sequential, and Dual Professional-Technical Secondary Education (EMTP-D), a newer program where they are simultaneous. Likewise in Benin, in recent years a dual-apprenticeship program or certificate of professional qualification (*Certificat de Qualification Professionnelle* - CQP) has been developed to improve the level of training of apprentices with school-based learning. As yet, this program reaches only a small portion of occupations accessed through TVET. In Nepal, an important role of the LELAM project has been to accompany the development of the ENSSURE program, which has created a dual school-apprenticeship program and seeks to address perceptions that TVET programs are school-based. Costa Rica has at present only one dual-apprenticeship program (excluding small pilots), that of the National Apprenticeship Institute (INA), which is non-formal in nature and small in numbers. Costa Rice does, however, have dual professional education programs at the tertiary level.

Alongside these institution-based programs, “traditional” apprenticeships with varying levels of formalization are prevalent in some of the partner countries. In Benin, apprenticeships are very informal with little oversight from public TVET institutions. As such they are often low-quality, with poorly (if at all) trained teachers. TVET institutions have stepped in to improve this situation and the quality of apprenticeships with the “upgraded apprenticeship” program or certificate of occupational qualification (*Certificat de Qualification aux Métiers* – CQM), which provides a framework for competences and training standards for some craft occupations, leading to formal certification of the apprenticeship. Like the CQP however, its scope remains limited. On the other hand, in Chile, the Training in the Workplace program is overseen by governmental actors through the Ministry of Labor. Nevertheless, the government’s interest in this program is more in expansion than quality control and they therefore also offer a lower-quality alternative to the dual programs. Historically, traditional forms of apprenticeships remained important TVET activities in Nepal where government investment in a formalized TVET system began about 70 years ago.

The extent to which TVET actors and institutions are linked, and the level of formality of these links, vary between countries, as does the level of involvement in curriculum value chain (CVC), oversight, and other quality-control related tasks. In Benin, collaboration between government and donor organizations, and donor organizations and education providers is generally good, but due to many overlapping roles within public institutions, the link between government and educational providers, both public and private, is weak, leading to poor oversight of many programs. Chile also suffers from poor links between institutional actors, but in this case, the quality of institutional linkage is rather due to the business sector being officially represented in formal bodies by advisory bodies made up of employer and trade-union representatives, with little curriculum input. Indeed, the Chilean TVET curriculum is almost entirely controlled by the central Ministry of Education, and the programs are short, change often and in general do not meet the expectations of potential employers. Moreover, the links between the educational providers and the employment sector is an area requiring much improvement. The TVET system in Costa Rica was also characterized by weak links between government and business institutional actors – for instance, the National Apprenticeship Institute dual program has no form of external oversight or accreditation, and business groups have little input into curriculum or program content. However, the advent of the LELAM program itself has seen improvement in this area. The linkage between the government and the business sector is weak in Nepal too. Furthermore, there is less coordination even among the government agencies in implementing TVET programs. A federal-level study on TVET financing in Nepal showed how clarity in financing mechanisms in TVET as well as having clarity about the distinction between formal programs and non-formal courses is important for better resource allocation to the sector, because the institutional framework for formal and non-formal offerings differs and thus the incentive systems would also have to be designed differently. The issue of linkage is studied in more detail in research question 3.

2.3 Summary of contributions and link to overarching research question

Social institutions may well create, or at the very least contribute to, the conditions under which TVET can function optimally. It is therefore vital that developing tools and strategies to assess and measure social institutions be a part of any research on the impact of TVET on youth labor market outcomes.

Below, we briefly describe the key results of the project for this first research question, as they relate to the overarching research question of the LELAM project.

Under what conditions can TVET reduce unemployment, improve employment, quality of work and thus the income of the youth? – Intermediary Conclusions

- The four case studies analyze and classify the four countries' TVET programs and courses. They also contribute to a common understanding among stakeholders and help organize the governance of institutions and the related sub-sectors (formal/non-formal) in a more targeted way. An important condition is therefore that this ecosystem of institutions can be grasped and that their actors are involved in an institutionalized dialogue
- We developed a theoretical **framework and methodological approach** for assessing the robustness of social institutions, laying the groundwork for future empirical assessments of TVET programs' social institutions' robustness. This is a necessary condition for bringing the socially constructed institutional framework into a function-oriented framework that makes country comparisons possible.
- In **Chile**, vocational education is of poor quality and low relevance. Thanks to detailed insights into the coordination of actors from the education and employment systems, reform leaders can better identify which strengths within a program they can reinforce and which weaknesses need to be overcome. Since these are partial aspects of social institutions, each case must be considered from a culture- and country-specific perspective.
- Strengthening the social institutions of existing, trusted forms of TVET through formalization and better oversight, such as the introduction of CQP and CQM in **Benin**, may lead to improved outcomes.
- Understanding the institutional framework for formal and non-formal TVET programs is a pre-condition to identify the financial flows within formal TVET. This is particularly important for **Nepal**, which has had a right to formal education at primary and secondary level since the constitutional amendment of 2015.
- The mapping and visualization of existing institutions, programs and courses in TVET was an important prerequisite for the new legislation in **Costa Rica**, which aims to overcome institutional fragmentation in particular.

2.4 Output and future research plan

The bulk of the output of the project concerning research question 1 has been Country Case Study papers, as well as the theoretical contributions regarding defining and measuring social institutions of TVET. Table 1 summarizes the formal research output related to this question[2].

Phase 2 of the project will continue to investigate some of the sub-questions related to the social institutions in TVET programs. Notably, research on social institutions will continue with an empirical investigation into which institutions carry out TVET functions and how they differ by country context. This phase of the project is time and resource consuming, in terms of preparation, data collection and analysis, but when complete will provide a meaningful contribution to education systems research and practice by identifying how the the robustness of social institutions and the functions and processes they govern impact the success of education programs. Furthermore, the impacts of formalizing informal education types will continue to be assessed, as will the process of better integrating actors from the employment system into TVET systems.

[2] A full table of all publication output of the project, including detailed publication status, can be found in the Appendix.

Table 1: Research output, Research Question 1

Year	Authors	Title	Type
2019	Renold, Rageth, Caves, Bürgi	Theoretical and Methodological Framework for Measuring the Robustness of Social Institutions in Education and Training	LELAM Working Paper (No. 2)
2019	Baral	Positioning Informal Skills Learners in Nepal's TVET System.	LELAM Working Paper (No. 4)
2019	Peralta Rojas, Bordón Tapia, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Chile.	LELAM Working Paper (No. 6)
2019	Baral, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Nepal. LELAM Working Paper	LELAM Working Paper (No. 7)
2019	Cannacho-Calvo, García-Fallas, Kemper, Maldonado-Mariscal, Vargas-Porras	Country Case Study on Technical Vocational Education and Training (TVET) in Costa Rica	LELAM Working Paper (No. 8)
2019	Nouatin, Bankole, Gandonou, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Benin	LELAM Working Paper (No. 9)
2019	Parajuli, Renold, Bhandari, Lamsal	Financial Flow in TVET in Nepal: Transiting from the Old to the New Constitution	LELAM Working Paper (No. 10)
2020	Baral	Developing a Typology of Informal Skills Learning Places in Nepal.	LELAM Working Paper (No. 17)
2020	Bankole, Nouatin, Gandonou	The Dual Apprenticeship in Benin: Strategic Actors and Roles	LELAM Working Paper (No. 18); published as book chapter.
2020	Camacho-Calvo	Nociones y prácticas evaluativas basadas en el enfoque por competencias implementado en los Colegios Técnicos Profesionales de Costa Rica (Notions and evaluation practices based on the approach for competences implemented in the Professional Technical Colleges of Costa Rica).	Peer-reviewed publication: Revista Actualidades Investigativas en Educación, 20(2), 1-36.
2020	Camacho-Calvo, Hilje-Matamoros, Rodríguez-Ríos	Un acercamiento a la formación por competencias en la educación técnica costarricense (An approach to training by competences in Costa Rican Technical Education).	INIE-UCR Publication

3. Measuring youth labor market situations in low and middle-income countries

In order to assess the impact of TVET programs and institutions on youth labor market outcomes, it is first necessary to have accurate, reliable measures of the youth labor market in low-income and mostly informal labor market settings, which has been a neglected field of research up to now. As such, the second research question of the LELAM project focuses on devising theoretical and empirical strategies for measuring youth labor market situations. The focus is on more than simply income and unemployment: the Youth Labor Market Index for Low-Income Countries (YLILI) provides a multidimensional measure of job quality, accounting for the particularities of labor and education market situations in many countries around the world. In addition, the Mobile Youth Survey explores if and how labor market data of youth can be collected on a more frequent basis, which is particularly important (as our first results show) for young people who change educational institutions, and who jobs more often than adults.

3.1 Indicators of labor market quality

Income and unemployment are the two aggregate measures most often used to measure the strength of a labor market, in wealthy countries especially. However, these two indicators do not necessarily capture either the strength of the youth market in particular, nor the quality of employment for those transitioning from education into the labor force. We therefore developed the Youth Labor Index for Low-Income Countries (YLILI). This index de-emphasizes unemployment as a measure of labor market strength and replaces it with measures that are relevant to varying informality rates in the economy. The YLILI comprises 12 indicators organized into 3 dimensions: Transition into the labor market, Working Conditions in the labor market, and quality of Education. The International Labor Organization (ILO) and UNESCO are the two main sources for youth-specific country-level statistics; included among the 12 indicators are the youth NEET (Not in Employment, Education or Training) rate, youth working poverty rate, share of youth in informal employment, and the youth illiteracy rate. A list of all individual indicators can be found in Appendix A. The indicator, dimension, and index scores are shown for 78 low- and lower-middle income countries in Appendix B, alongside country rankings in terms of the YLILI score, GDP per capita (PPP) and the youth unemployment rate.

The YLILI suggests that strengths of youth labor markets vary widely across countries. Analysis suggests the strength of the youth labor market is the highest in Central Asia, followed by South Asia and sub-Saharan Africa. Working conditions and education remain important issues in all of sub-Saharan Africa, while the picture is more mixed for South Asia. Interestingly, transition scores are high in developing countries, suggesting that many workers are unable to withstand extended periods of inactivity. Concerning the LELAM project partner countries, only Nepal and Benin are classified in the low- and lower-middle income range. The results for these two countries vary considerably: Nepal ranks highly – tenth – on the YLILI index while recording unemployment rates towards the lower end of the rankings, in 51st place. Benin, on the other hand, ranks 42nd for YLILI respectively, but does better on unemployment, ranking 13th, which again illustrates that unemployment is of limited use for analyzing the labor market situation of the youth in low-income settings. Unemployment is, however, still the most commonly used indicator for measuring labor market strength. This suggests that the YLILI incorporates important information that is not captured by the standard measures of labor market strength -

particularly for countries whose high economic informality makes those measures inapplicable. We hope that this holistic but concise measure will thus gain traction as an indicator of countries' progress against stagnating labor market opportunities for youth. Moreover, the three dimensions – transition, working conditions, and education, do not correlate highly with each other, making the index a useful tool for identifying areas of relative concern for specific countries or geographic areas. Nepal and Benin again provide examples of this phenomenon – while Benin scores relatively well for transition, its results for working conditions and education are much lower. Nepal, on the other hand, scores reasonably well on transition, moderately well on education, but less so on working conditions.

Last, our analysis also shows that data for youth around the globe is scarce. Whereas disaggregated statistics for women and men have long entered mainstream analysis this is not the case for labor market statistics disaggregated by age, which we argue is essential if further improvements in policy for the youth are to be made. Moreover, key indicators for understanding the labor market of the youth are completely missing.

3.2 Measuring youth labor market situations

3.2.1 Youth labor market in Benin

Apart from the meta analysis across countries, we explored if and how countries can collect high frequency data for the youth (specific to their country context) which is essential if one wants to understand the effect of various TVET reforms on the youth labor market. A phone-based youth survey in Benin, with the principal aim of gaining greater understanding of transitions from education to work for those having completed vocational education programs has been set up in the first phase and will be continued in the second phase as well as expanded to Nepal (if COVID allows). A novel data collection method was used to measure youth transitions into the labor market. Modelled on the ILO's School-to-Work-Transition Surveys (SWTS), which were carried out in various lower- and lower-middle income countries in the early 2010s, we began with a detailed in-person survey concerning young people's schooling and employment. The innovative component was a battery of low-cost, mobile-phone based "follow-up" surveys generating longitudinal data capturing youth at various stages in their transition. In contrast to the SWTS, more emphasis was placed on youth still in education and training (with special attention paid to TVET), and an older sample was chosen (20-29 instead of 15-29) – as most young people in Benin between the age of 15 and 19 are still in secondary school. The survey was carried out with apprentices in various urban areas in Benin. First results are:

Phone survey attrition rates have been mixed
On one hand, the 11% attrition rate between the baseline and the first follow-up round, conducted three months later, compares positively to similar studies and, given the potential savings in costs, suggests that phone-based surveys may be a tool for studying youth labor markets. The second follow-up round, conducted four months after the first (and seven months after the baseline), saw, however, a 27% rate of attrition relative to baseline, despite multiple attempts at reaching non-respondents. This is severe enough to make biased attrition (e.g. self-employed dropped out at twice the rate of apprentices) a potential threat to statistical inference. However, the second follow-up was conducted as preparations for the Coronavirus were beginning in Benin, possibly increasing non-response. The third follow-up round (planned for September 2020) will be telling.

Rising education rates have side-effects
31% of 20- to 29-year-olds in urban Benin are enrolled in education (not including apprenticeship). This is high, on par with enrollment rates in industrialized economies such as Germany (33.6% in 2017, per

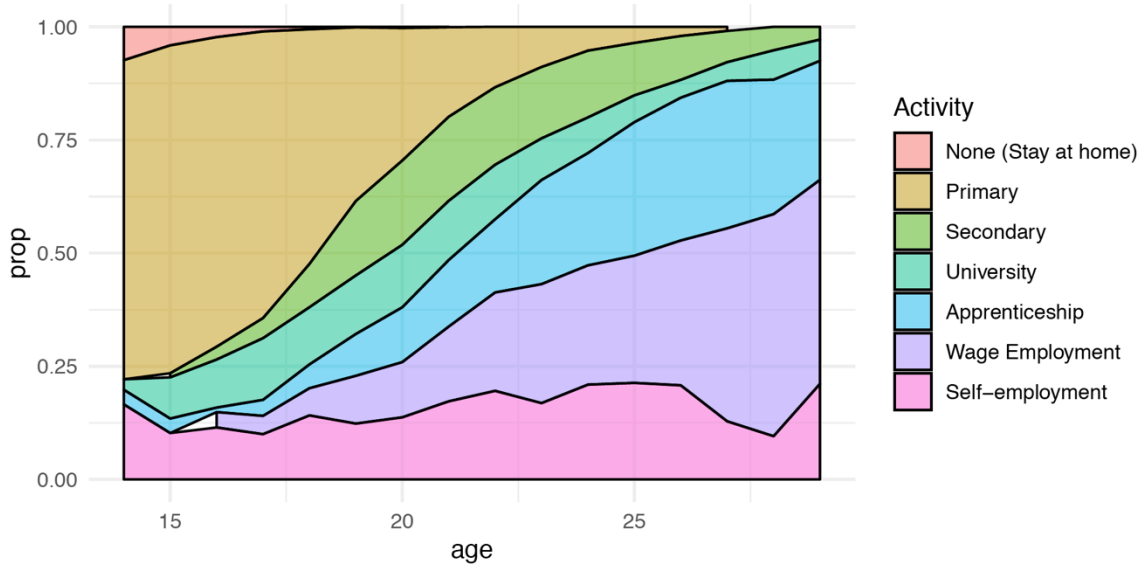
the OECD) and Switzerland (27.2%), and higher than the US (24.6%) or France (21.9%), from which the formal education system in Benin is largely inherited.

The distribution of educational attainment by activity suggests that ever-increasing educational attainment can be a double-edged sword. Youth in wage employment are indeed more educated than the self-employed – but so are youth that are economically inactive (in neither education, employment, nor training - NEET). This may be in part because the reservation wage - the wage for which youth are willing to work - is higher for youth who complete more education.

The transition to work in Benin takes place late and is slow

The longitudinal structure of the survey allows us to track the transition from education to work in detail, by looking, for example, the paths that school graduates take. Questions pertaining to respondents' past activities also allow to visualize the transition from school to work (Figure 2). The inactivity rate fluctuates between 10% and 20% for all youth, while the proportion of youth in either education or apprenticeship does not drop below 50% until age 23. After this age, however, exit from the education system is rapid, and by the age of 26, 85% of youth have left the education system.

Figure 2: The transition from school to work in urban Benin is slow and late



Job market is highly dynamic and informal

The time-series allows us to identify the most common paths through the various activities. 40% of respondents transitioned between various types of employment and economic inactivity over only 10 months. Transition between self and wage employment and vice-versa was between 10% and 16% in both waves; transition from either self or wage employment into inactivity is between 14% and 17%. Encouragingly, NEET appears to be a transitory stage, with 44% of inactive youth transitioning to either wage or self-employment within the two follow-up surveys. Formal employment is exceedingly rare - only 6.22% reported having a written contract. The majority of youth with written contracts describe their job as being in the "professional, scientific and technical" domain - jobs which exceedingly scarce in low-income labor markets, particularly for younger workers.

Youth are highly dependent on parental income

A surprisingly large proportion of youth in urban Benin are found to be dependent on their parents well into their 20s, a likely consequence of the delayed school-to-work transition described above. 46% of the youth in our sample live with their parents, and even the employed and independent workers are

just as likely to live with their parents as they are to rent. Parents sought out the master trainer for 30% of apprentices in the sample and support the daily expenditure of 63% of apprentices. Dependency for older students is even higher: parents supported the daily financial needs of 92% and made the tuition payments for 85% of students.

Youth labor markets are strongly segmented by gender, but there is little evidence of wage discrimination

Though school attendance has been steadily increasing for both men and women in SSA in recent years, young women have yet to catch up in terms of absolute attainment, especially at higher levels of schooling. Many women leave school early to begin lives as homemakers or petty traders. Accordingly, almost two-thirds of the inactive (NEET) youth and over half of the self-employed in our sample are women. Gender is consistently predictive in regression analyses of labor market outcomes. Young women are less likely to finish secondary school or participate in an apprenticeship and less likely to be working, either for themselves or for an employer. Wages are lower for self-employed women but not for those working for a wage, suggesting that gender discrimination in the more formal sectors of the economy are not the decisive factor driving women's lower labor market participation[3].

Youth are optimistic, but most foresee self-employment in their future

When asked, "What do you see yourself doing in five years?", most youth see themselves as self-employed, regardless of their education or current status. This includes those who had a job at the time of the survey. Youth are in general optimistic, with more positive feelings about the future than satisfaction with their current situation. This optimism includes youth not participating in the labor market. When asked where they see themselves in 5 years, NEET youth were decidedly optimistic. Less than 3% expected to still be searching for work, while over 90% envisaged themselves working either for themselves or for an employer. The majority (69.7%) of youth in this category saw themselves running their own business, which is higher than the rates seen among those in wage employment (50%), or even among the already self-employed (62%). Unfortunately, the optimism of the inactive does not quite match reality on the ground, which is one of low labor market demand. The rate of NEET youth who foresee themselves working in a wage job in five years (21.2%) is almost double the actual wage-employed rate (11.7%).

3.2.2 Youth labor market in Nepal

For the case of Nepal, we analyzed seven individual-level surveys between 1995 and 2014 to study formal education, wage-employment and formal sector employment. The results suggest that formal sector employment amounts to about 23%, while wage employment is about 51%. This finding highlights the necessity to choose measures for the youth labor market situation carefully.

The results further show that formal tertiary education increases the probability of employment in the formal sector by 51% compared to individuals without education. This relationship is less strong for secondary education (22%) and primary education (7%). These effects are relatively small compared to the results from meta-analytical studies. This comparison shows that the ability of TVET to improve the youth labor market situation is not set in stone: where employment in the non-formal sector remains prevalent, TVET may only make a small impact on the likelihood of finding a job in the formal sector.

This conclusion is corroborated by further results showing that about half of the relationship between formal education and formal sector employment arises from working in government related sectors. Therefore, the hiring practice of the government matters substantially for the potential of TVET to enable

[3] See Appendix C for summary survey statistics based on gender.

graduates to find formal sector employment. If the government does not promote TVET graduates or hire them itself in greater numbers, the acquired human capital of TVET graduates has a limited impact on formal sector employment, suggesting that improving the recognition of TVET alongside increasing human capital is important.

3.3 Summary of contributions and link to overarching research question

If the first research question of the LELAM project focuses on the social institutions of TVET systems and how they contribute to TVET's success, the second focuses on measuring the outcomes of such systems. Outcomes-based research necessitates both a robust measurement strategy and access to quality data for an empirical implementation of this measurement. Only with both these elements is it possible for the LELAM project to provide accurate and useful information that shapes the response to the overarching research question. Below we outline the key contributions made to this research question by the project thus far, in the context of the motivating question of the project.

Under what conditions can TVET reduce unemployment, improve employment, quality of work and thus the income of the youth? – Intermediary Conclusions

- "Traditional" measures of labor market strength such as unemployment rates are not always well-adapted for analyzing the youth labor market situation in low- and middle-income countries, especially for youth **transitioning from education to employment**.
- The newly developed **Youth Labor Market Index for Low-Income Countries** (YLILI) accounts for the particularities of such labor market paradigms. Empirical analysis using this index shows that it is **not necessarily correlated with unemployment rates**, nor are the dimensions, education, transition and working conditions, correlated with each other. This suggests such a multidimensional index is important for a holistic understanding of education to labor market transitions for youth. Provided that reform leaders have access to empirical evidence that correctly diagnoses the situation of youth in the labor market, the conditions for sustainable TVET programs can improve.
- TVET systems need first of all to lead to better working conditions. As the YLILI has shown, transition from education to the labor market is usually not an issue in low-income settings, as most youth probably cannot afford to stay unemployed for extended time periods.
- A phone-based survey in **Benin** found that TVET graduates are mostly **satisfied and optimistic**, but that youth transition relatively late into the labor market, are dependent on parental income and anticipate self-employment. A condition for the success of TVET in improving youth outcomes is therefore that it should continue to work to be seen as a path to speedy integration into stable and independent work.
- In **Nepal**, **formal education** is somewhat linked with a greater likelihood of **formal and salaried employment**. The position of TVET in this reality is related to the **hiring practices of the government sector**, and whether it prioritizes the hiring of TVET graduates throughout the economy. It follows that a condition for better integration of young people into the labor market is the expansion and consolidation of formal TVET programs.

3.4 Output and future research plan

The research output for research question 2 has been largely related to the development of tools to provide a more detailed picture of youth labor market situations in low- and middle-income countries, notably the YLILI. Empirically, analysis of the first waves of the Benin survey has commenced, as well as analysis of existing surveys for Nepal and meta-analyses of literature concerning transitions for TVET to employment. Table 4 provides an overview of the research output to date.

Future research on research question 2 in the second phase of the project will center on continuing labor market surveys in Benin, as well as launching – if COVID allows – a longitudinal survey in Nepal. The learnings and questionnaires from the first phase can also be used to analyze intervention (research question 3) on labor market outcomes in other partner countries. The YLILI will be moved online for policy makers to compare and track progress of their labor markets. Moreover, the YLILI will be disaggregated by gender. As with much labor market research covering recent years, the impact of the COVID pandemic on youth in the partner countries can also be analyzed.

Table 2: Research output, Research Question 2

Year	Authors	Title	Type
2019	Bolli, Parajuli, Renold	Has the relationship between formal education and the formal employment sector in Nepal changed between 1995 and 2014? (Published title: Changes in the relationship between formal education and formal employment sector in Nepal between 1995 and 2014)	LELAM Working Paper (No. 1); peer-reviewed publication
2020	Kudrzycki, Günther, Lefoll	Youth Labor Market Index for Low Income Countries	LELAM Working Paper (No. 13); accepted for publication
2020	Kudrzycki, Günther, Kpenavoun Chogou, Bankolé	The Working Lives of 1250 Urban Youth in Benin	LELAM Working Paper (No. 14); accepted for publication

4. Improving linkages between education and employment systems

While the first two research questions of the LELAM project focus on understanding the TVET system, labor market and youth outcomes, the third question turns to how improving links between actors in both education and employment can improve outcomes for youth – to an extent, combining elements from the first two questions. As has already been discussed in section 2 of this paper, the different TVET systems of the partner countries are at different stages and levels of development, including concerning their links to other institutional actors. In this section, we delve into greater detail regarding links between education and employment systems, how these links have developed, and what impact they have on outcomes for youth exiting TVET.

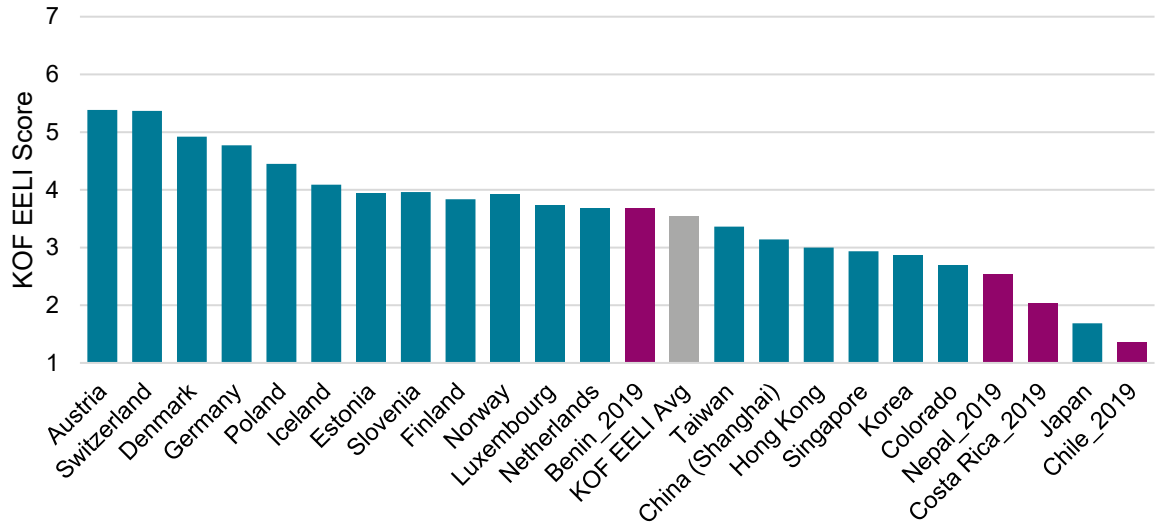
4.1 Linkage assessment in a global context

4.1.1 Education-employment linkage index

The education-employment linkage index (EELI; Renold et al. 2016) was developed to measure the degree of linkage between the education and employment systems in a country across several factors, and to assess the curriculum design, delivery, and updating phases of each program, each of which are governed by one or more social institutions. We use the index to compare linkages across countries, with a particular focus on the four LELAM partner countries. We measure the index via an online or offline survey designed for expert respondents from education, industry, and research. The overall response rate was 62% (147 out of 238 experts responded), with specific response rates of 76% in Benin (39 of 51), 38% in Chile (26 of 29), 80% in Costa Rica (55 of 69), and 55% in Nepal (27 of 49). We used the weighting scheme detailed in Bolli et al. (2018) to calculate total index values.

Figure 3 shows total index scores for all four countries in relation to all of the countries that have already been measured using the EELI. Possible scores range from one (no linkage, education-system actors have all of the power in the program) to seven (high linkage, actors from the education and employment systems share power). Chile and Costa Rica, the middle-income countries, score low relative to the field at 1.4 and 2.0, respectively, on a one-to-seven-point scale. Nepal scores slightly higher at 2.5, and Benin scores the highest of these countries and the only one above the overall average, at 3.7. The overall average reflects the initial 18 countries measured in Renold et al (2016), all of which are top performers on either TVET enrollment or youth labor market outcomes: the benchmark is therefore higher than a true global average would be.

Figure 3: Results in international context



After delving into the specific characteristics of each program and the component phases, processes, and sub-processes that make up the EELI, we find that all countries tend to have relatively lower scores in the curriculum design phase. Benin's success appears to come from its strategy of bringing formal education into an existing employer-led program of traditional apprenticeship – since this program (CQP, see section 2.2 for more details) is relatively new, the second phase of the project will include an evaluation of the CQP to obtain a more accurate measure of its success in improving youth labor market outcomes. The other countries have to bring employers into education-led programs. As a result, we find two patterns to increasing linkage and therefore TVET program quality, which will lead to better outcomes for youth employment, income and job quality. These patterns are the education integration approach exemplified by Benin, and the more common—and possibly more difficult—employer integration approach followed by the other three countries.

4.1.2 Meta-analysis of vocationally-oriented training interventions

We also conducted a meta-analysis of the literature concerning the impact of vocationally oriented training interventions on youth labor market outcomes in low-, middle-, and high-income countries. The first step of the meta-analysis assembles all empirical studies that analyze the impact of informal and non-formal vocationally oriented training interventions targeted at youth and young adults (14-35 years). These programs are typically part of Active Labor Market Programs (ALMPs)[4]. The second step consists of aggregating the results from the different studies. Overall, we find evidence for a statistically significant positive impact of vocationally oriented training interventions on employment and earnings. The third step investigates whether the estimated effects depend on the characteristics of interventions or studies such as their content, design and actors, different outcomes, participants, evaluation methodology and geographical location.

Regarding content, design and actors, we find that interventions combining in-classroom with workplace-based training lead to better employment and earning outcomes than pure workplace-based or in-classroom interventions.

Interventions offering entrepreneurial or business skills training in addition to vocational training do not lead to better outcomes than interventions offering only vocational training. In contrast, interventions

[4] Studies of formal VET programs are planned for future, separate meta-analyses.

that teach soft skills on top of vocational skills improve labor market outcome relatively more. Further, interventions providing a training certificate to participants also lead to outcomes that are more favorable.

We further find that the evaluated impact of training interventions for males is lower. Younger participants aged 24 and below profit relatively less than participants aged above 25.

Relative to studies using other evaluation methods, the impact of interventions on youth labor market outcomes found by studies employing Randomized Controlled Trials (RCTs) are lower in high- relative to low-and middle-income countries.

Concerning intervention duration, in high-income countries, shorter (< 400 hours) and medium (400-800 hours) interventions lead to more favorable employment and earning outcomes than longer (>800 hours) interventions, where training may reflect the opportunity costs of job search. In contrast, in low- and middle-income countries, the duration of programs does not make a difference, all lead to equally good outcomes.

Finally, in low- and middle-income countries, the impact of training is more positive in the short term (<1 year after intervention exit) relative to the medium (1-2 years after intervention exit) and the long term (>2 years after intervention exit). This may reflect that training interventions in low- and middle-income countries act more as a signaling and screening device, while as opposed to a productivity increase through human capital accumulation. In high-income countries, the impact of training is equally positive in the short, medium or long term.

4.2 Linkage assessment in Nepal, Costa Rica, Chile and Benin

We have thus far in this section focused on the question of linkages in broader terms. In the following we describe projects within LELAM that address the linkage question from a different angle, trying, where possible, to identify causal effects as answers to our overarching question.

4.2.1 Nepal – Evaluating the ENSSURE project

The Swiss Agency for Development and Cooperation (SDC) finances the Enhanced Skills for Sustainable and Rewarding Employment (ENSSURE) project in Nepal. This project aims to improve labour market outcomes of Nepali workers. One of its key programs is a pilot project of a Dual TVET-Apprenticeship. This formal higher secondary education programme lasts for 24 months. The first three months consist of classroom education. The following 20 months combine four to five days of workplace training per week with one day of classroom education per week. Finally, the last month consists of classroom education. This aspect of the ENSSURE project represents an effort to encourage greater collaboration between vocational schools and employers, and thus presents an opportunity to analyze the effect on employment outcomes of increasing and improving linkages between education and employment actors. We do so by in the first case, following the apprentices in the first cohort, and in the second case, using a random control trial analytical setup to observe differences between apprentices chosen for the program and those who are not. The project is therefore a useful opportunity to study in detail the impact of a program characterized by strong and improving links between actors on outcomes for apprentices. The program is still in its early phases. However, we are able to present here some preliminary information on the program and first descriptive results.

In summer 2018, 181 apprentices of the first cohort have started the programme as technicians in mechanical and technical engineering, delivered by four schools in States 1, 3 and 5 of Nepal. Expanding the geographic scope to State 6, the second cohort of the Dual TVET-Apprenticeship project has started in November 2019 enrolling 960 apprentices in five occupations, adding hotel management, information technology (IT) and automobile engineering to the list. However, three months after the beginning of the second cohort, when apprentices were preparing for their workplace-based learning after finishing the school-based phase, the COVID pandemic and associated temporal lockdowns have disrupted the program.

The main objective of the project consists of estimating the impact of the Dual TVET-Apprenticeship on the youth labour market situation. Therefore, the project has randomized 1412 applicants that have applied for 446 apprenticeship places of the second cohort in eleven schools with sufficient oversubscription.

The second cohort was planned to finish the program in autumn 2021. The Covid-19 crisis will delay this timeframe by several months. Hence, we plan to analyse the youth labour market situation in 2022. However, while estimating the causal impact represents the main objective of the project, it has already lead to three papers that contribute to the analysis of how the implementation and continuation of systemic changes in TVET can be enhanced (research question 4). These initial studies have already had an impact on the design of the next phase of the SDC ENSSURE project.

The results suggest that the first cohort is going on well. However, the results also raise questions about scaling up the programme. Moreover, we find that companies make a small net benefit participating in the program. The net benefit is similar across company size but is substantially larger for electrical engineering than for mechanical engineering technicians. These preliminary results suggest that linkages between education and employment sectors could be encouraged by underlining to employers the net benefits to them of taking a more active role in TVET programs.

4.2.2 Improving links between educational and employment actors in Chile and Costa Rica

Prior to their participation in the LELAM project, both the Chilean and Costa Rican TVET systems, as far as they existed, were characterized by a lack of linkages between educational and employment actors, as well as a low relevance of the course content and poor outcomes for those exiting. The LELAM project has provided an opportunity for different actors to meet and collaborate with an aim to deepening ties between actors in education, employment and government and consequently an improvement of outcomes for those in the TVET system. The team at the University of Costa Rica has notably positioned itself as an active participant in developing the TVET system in the country, acting as a forum for exchange and a conduit for change based on best-practice recommendations. As an example, the *Thematic Observatory for Education and Professional Technical Training* allows researchers from various universities in the country to undertake research on TVET programs, with the purpose of providing evidence-based advice to facilitate the insertion of young people into the labor market, necessitating improved links between education providers and employers. Moreover, the LELAM project has contributed by implementing surveys aimed at understanding education-employment linkages in the country's main TVET programs: the Professional Technical Colleges of the Ministry of Public Education and face-to-face training programs of the National Learning Institute. The results of this survey allowed us to identify the major structural problems of the country's educational systems, and the need for greater connection with the labor market. This has in turn helped to generate momentum for new educational reforms related to TVET at the government level.

In Chile, despite TVET representing a sizable proportion of those in education (slightly over one-third at the upper secondary level were in the technical-professional stream in 2019), its relevance and outcomes suffer due to a lack of linkage between the educational and employment sectors. Added to this is the ambiguous role of the government, which on the one hand is interested in improving outcomes for those leaving TVET programs, but on the other hand seems to show more intent on oversight and regulation without the input from other actors. It is in this context that the LELAM project both seeks to analyze current links between actors and their effects on outcomes, as well as encourage improvements in this area. As has been previously mentioned in chapter 2, employer participation in many formal TVET programs is limited to advisory bodies. However, in non-formal programs, the latitude for employer intervention is greater. For instance, the Training in the Workplace program allows an employer to choose an educational program for an apprentice that takes into account the needs of the company. If no appropriate program exists among those offered by TVET institutions, it can choose to create an in-house program, approved in advance by the Ministry of Labor. Whether such programs provide improved outcomes for apprentices upon completion requires further study. The project has also studied linkages between actors within the education sector, notably from the secondary to the tertiary level, how the transition between these two levels is facilitated, and whether the professional-vocational track provides improved access to STEM programs than the general. Results indicate that while overall there is no discernible difference in enrollment rates for STEM programs at the university level by type of secondary education, there are significant gender differences: females who have completed secondary education as a part of the Technical-Professional Secondary Education (EMTP) proceed to STEM courses at tertiary institutions at a far lower rate than females who have completed the General Secondary Education (EMCH), while for males the trend is reversed. Encouraging further studies in STEM fields therefore requires the emphasis to be placed on different institutional linkages for males and females. This finding has further implications for institutional linkages within TVET systems in general: how links are forged and managed needs to be considered and modified based on the context and the desired outcome.

4.3 Summary of contributions and link to overarching research question

In order to have smooth and successful transitions from education to employment, robust links between institutional actors are required. Investigating these institutional linkages is therefore central to better understanding of the overarching research question of the LELAM project. The project has both contributed to greater knowledge of the role of these links, as well as used its unique position and expertise to create and improve links between actors in certain circumstances. Below we outline the key contributions of this work to the overall research question of the LELAM project.

Under what conditions can TVET reduce unemployment, improve employment, quality of work and thus the income of the youth? – Intermediary Conclusions

- Successful TVET programs throughout the world are **characterized by strong linkages between institutional actors**, as shown by the Education-Employment Linkage Index (EELI). It is therefore an important prerequisite for the establishment or reform of TVET programs to know this institutional linkage intensity in order to build on strengths and eliminate weaknesses. Without a detailed diagnostic tool based on functional equivalencies and thus internationally comparable, it is likely to be difficult to initiate the right reform steps.
- The four LELAM countries are currently characterized by comparatively **low levels of linkage between education and employment actors**, with the exception of **Benin**, which scores slightly above the KOF EELI average. There is therefore significant scope for improvement in this area, which should lead to improved outcomes for youth employment and income. It is important that reform leaders take note of this evidence and initiate systematic change in the TVET system based on it (see Chapter 5). In addition, by measuring the robustness of social institutions (Chapter 2), we hope to gain further insight into which other functions are relevant to improve the impact of TVET programs.
- A **meta-analysis** of the literature on the impact of vocational training interventions on labor market outcomes shows that the best outcomes are observed in interventions that **combine classroom study with workplace training**, and are often backed by private actors, as well as NGOs and national and international organizations. However, **short-term effects are strongest**, suggesting participation may be used as a screening device rather than a signal of increased productivity in the long term – more emphasis should be placed on the **long-term benefits of TVET**. A meta-analysis of existing research results on the effects of TVET programs and TVET courses is a necessary prerequisite for identifying gaps in research and specifying one's own research.
- In **Nepal**, the 24-month dual TVET Apprenticeship project links employers and technical schools more closely though a dual education program. A random-control trial will be able to provide in-depth information on the success of this program. Preliminary results suggest **employers and apprentices are happy with the program**. Emphasizing the **net benefits to companies** of such an approach could be a way of encouraging further employer participation. Provided that such causal effects can be demonstrated, reform leaders and development partners can be recommended to promote an upscaling of such programs. This is a prerequisite for identifying longer-term effects in labor market data.
- The LELAM project has resulted in **improved collaboration between actors in Costa Rica**, with the University of Costa Rica acting as a forum for exchange and cooperation. Surveys among TVET institutes have **contributed to policy change encouraging greater institutional linkage**. Provided that the relevant partners from education, employment and science establish institutionalized cooperation, social institutions can also be strengthened.

4.4 Output and future research plan

The research plan of the LELAM project placed greater emphasis on developing theoretical frameworks and measurement tools during the first phase. With the third research question, we move towards the implementation of programs and observation of outcomes. This necessarily means that much of the research related to this research question will be concentrated in the second phase. Notably, the RCT in Nepal represents a significant opportunity for analysis of a project that seeks to improve linkages between education and employment actors. However, with the program still in its early stages and the impact of the COVID-19 pandemic still unclear, the bulk of this analysis will be taking place in the second phase of the LELAM project. Likewise, analysis of survey data from Costa Rica continues, as does an analysis of the effects of institutional characteristics on employment opportunities in Chile. In addition, the CQP program in Benin will be evaluated. Baseline evaluations have been conducted during phase

1 and a follow-up survey will be conducted during the second phase (if COVID allows). Nevertheless, the project has already produced a number of research papers on the topic of institutional linkages, the details of which are listed here. The EELI represents a cross-sectional analysis. In order to identify the impact of systemic change (Chapter 5) on this important measure for TVET programs, we will conduct a further measurement towards the end of the second project phase to identify possible changes.

Table 3: Research output, Research Question 3

Year	Authors	Title	Type
2019	Caves, Ghisletta, Kemper, Renold	Meeting in the middle: TVET programs' education-employment linkage in developing contexts	LELAM Working Paper (No. 3)
2019	Bolli, Parajuli, Kemper, Renold, Thapa	First Report on the Dual VET-Apprenticeship Programme in Nepal: Formative Assessment of the First Cohort	LELAM Working Paper (No. 5)
2020	Bolli, Parajuli, Kemper, Renold, Thapa	Projection of Net Benefits for Companies in the Dual VET-Apprenticeship Programme in Nepal	LELAM Working Paper (No. 12)
2020	Nouatin, Gandonou, Bankole, Renold	Reforms of Technical Vocational Education and Training system in Benin: An exploration of social anthropological field	LELAM Working Paper (No. 15)
2020	Peralta, Quiero, Canals, Maldonado	The effects of Professional Technical High School Education when applying to study for STEM undergraduate degrees at Chilean universities. A causal analysis based on observational data.	LELAM Working Paper (No. 19)
Forthcoming	Camacho-Calvo, García-Fallas	Descriptive analysis of the number of students who graduate from Professional Technical Colleges of the MEP and who enter the University of Costa Rica, the National University, the National Technical University and the State Distance University.	LELAM Working Paper (forthcoming)
Forthcoming	Camacho-Calvo, García-Fallas	Preliminary findings of the implementation of the dual education pilot plan in the Automotive specialty in the Professional Technical Colleges in Costa Rica: the students' voice.	LELAM Working Paper (forthcoming)
Forthcoming	Ghisletta, Kemper, Stöterau	Untitled meta-analysis	Manuscript in preparation
Forthcoming	Günther, Kudrzycki, Gandonou, Kpenavoun Chogou	The Effect of Adding Formal Education to Informal Apprenticeships: The case of the Certificat de Qualification Professionnelle (CQP)	Manuscript in preparation

5. How can the implementation and continuation of systemic changes in TVET be enhanced?

The final research question of the LELAM project relates the findings of the other questions to policy change and eventual impact through sustainable policy change. The main purpose is to investigate the enabling factors and barriers that determine successful reform implementation and continuation. We are also interested in how those key factors can be operationalized or measured, how implementation success should be evaluated, and what the roles are for foreign actors like donor countries and NGOs in supporting or hindering the implementation of systemic changes in TVET.

5.1 Research evidence

The project to date has already generated evidence that goes towards answering this research question. Two papers related to the ENSSURE project in Nepal address the question specifically. In addition, evidence from the country case studies demonstrates that reform implementation is supported by the increased visibility of problems in existing programs generated by qualitative and quantitative research. Finally, evidence collected thus far demonstrates two important productive roles for foreign actors: sources of information and sources of funding. These questions are not fully answered, but we present some of the evidence already collected in the following subsections.

5.1.1 Implementation drivers and barriers

The ENSSURE research agenda has already led to two papers that contribute to the analysis of how the implementation and continuation of systemic changes in TVET can be enhanced. The first paper uses interviews with schools, apprentices and firms of the Dual TVET-Apprenticeship to provide early insights into what works well and what might represent roadblocks for the further development of the program. The results suggest that the first cohort is going on well. However, the results also raise questions about scaling up the program. The second paper analyzes these questions in more detail.

The second paper analyzes drivers and barriers to scaling up the pilot project. We apply the 5C protocol[5] based on eight semi-structured interviews among government and industry representatives. The results show that involved actors are committed. Capacity in terms of available resources also represents an implementation driver, but companies lack information about the programme. Consequently, industry associations should receive a more prominent role in the motivation of companies to provide training places. The content category is the most challenging implementation barrier because the program represents a substantial change compared to the current TVET programs.

5.1.2 Evidence as an enabling factor for reform implementation

The case study from Benin notes specific factors that contribute to the implementation of reform of the traditional apprenticeship program. Specifically, all of the following problems with that pre-existing program contributed to the successful implementation of the reformed program: the lack of training standards, non-uniform cost of training, strategic interaction and conflicting relationship between masters and apprentices, unsanitary workplace conditions, outdated material and equipment, low level

[5] The 5C protocol (Brynard 2005: 658-62) is a method for conceptualzing policy implementation based on five interconnected variables: content, context, commitment, capacity, and clients & coalitions.

of education among most master craftsmen, lack of formal qualifications, and training gaps among master craftsman.

In Costa Rica, quantitative survey data on the educational sector and the education-employment linkage of key TVET programs allowed reform leaders to narrow the structural problems highlighted in their proposals, especially with regard to the need for stronger connections to the labor market. As stated by the reform team in Costa Rica, “this discovery has helped to generate processes for new educational reforms related to TVET, such as the Law and the Dual Education Regulation.” Having reliable research results also positioned the University of Costa Rica as a key source of information, leading to the creation of the Thematic Observatory for Education and Professional Technical Training in Costa Rica, based at the Institute of Educational Research. This result will further strengthen the implementation of evidence-based reforms in Costa Rica by developing evidence that can feed back into improved reform implementation towards the goal of improving youth labor market outcomes through TVET.

In Nepal, the evidence uncovered by the TVET case study formed the foundation for TVET reforms in the country. The TVET case study includes analyses of current formal and non-formal TVET programs under public, private, and NGO providers. It also estimates the overall current annual TVET enrollment capacity and explores major occupational areas of informal TVET programs. Such a measure of TVET institutions in the country has been proving to be the important foundational support for TVET reform in the country. The study on the linkage between formal education and formal employment also contributed to policy reform. In Nepal, research activities have helped identify the enabling factors and barriers to reform implementation. Specifically, the networking among stakeholders, knowledge development, and capacity building fostered by research have improved implementation success.

5.1.3 Foreign actors as sources of information and funding

Evidence from this research project has demonstrated that foreign partner countries have at least two productive roles in supporting the implementation of systemic change in TVET. First, foreign actors can contribute necessary financial resources to support reform implementation. In Nepal, the financial flow analysis showed that the development of the formal TVET system will hardly be possible in the coming years without the support of donor partners, especially since the new constitution has introduced a right to education for primary and secondary schools (LELAM Working Paper No 10). In Benin, the case study shows that the financial resources used to support implementation of the CQP program come from donors’ contributions as well as the annual budget of the ministries related to TVET and tuition fees (LELAM Working Paper 9). Further, the CQP program requires that students have funding available to pay tuition, which have also been supported by a combination of donor funding and the government budget (ibid).

The second demonstrable role for foreign actors is the provision and dissemination of information. Project partners in Costa Rica and Chile report that the information disseminated through the CEMETS institutes in Switzerland have been crucial. In both countries, information in the linkage between the education and employment systems has been particularly influential. Further information on the impact of CEMETS—a key part of the LELAM project’s pathway to impact—can be found in the later subsections of this chapter.

5.2 Implementation action outcomes

Because of its impact focus, the output for this research question is characterized not just by publications but also by action-based outputs like conferences, new programs, and reform planning work. The second phase of the project will continue this action-based work and add publications detailing the findings and experiences from that work that relates to each topic. We highlight three main activities of the project that have been particularly impactful in the following subsections: the international conference on TVET held in Nepal in September 2019, the Master's program on TVET management established at Kathmandu University, and the annual institutes that all four partner countries have been attending in Switzerland since 2017. Unfortunately the second congress, which should have taken place in Switzerland at the beginning of June 2020, had to be cancelled due to the COVID pandemic.

5.2.1 International Conference on TVET, September 2019

The international conference held in Nepal in September 2019 gathered about 300 TVET scholars, researchers, and practitioners from more than 35 countries representing all six inhabited continents. The individual papers, keynotes, and workshops allowed exchange on different issues and aspects of TVET. This conference contributed to establishing a network among the TVET actors from academia, practice, and policy. The international conference also created a platform for the LELAM project countries to share their project findings. Its national seminars and symposiums conducted at different times and at different places in the country contributed to bringing all three levels of governments together with other stakeholders, which was helpful to clarify their roles in TVET development. More specifically, these activities built Nepal's knowledge of TVET in the national and global contexts.

The conference also contributed to strengthening national and international networks. Such networks are important not just for implementing various TVET-related programs (i.e. student and faculty exchange in MTVET, providing scholarships for MTVET students, writing and publishing, conferences and workshops) but also for increasing interaction among different stakeholders (i.e. academia, government, private sector, development partners). Selected articles from the conference are being published in a special issue of the Journal of Education and Research, which is expected to be published in the third quarter of 2020. One very important contribution of all these activities has been that TVET has now become a matter of discourse, debate, and discussion among TVET stakeholders in Nepal. The media coverage of all these activities also shows growing general interest among the public.

The third expected outcome was to develop TVET experts who could lead TVET reforms in a sustainable manner and for influencing roles of local stakeholders. To meet this expectation, participation in CEMETS summer school, launching of the MTVET program, and enrollment of PhD and Postdoc were major three interventions. The participation of professionals from academia, government, and private sectors in CEMETS remained supportive towards realizing the need for clarifying the roles and responsibilities of TVET stakeholders at different levels, the TVET act, developing private sector's strategy paper and forming sector skills committee (construction, hospitality, and automobile) by professional associations.

5.2.2 Academic Program: Master's in TVET (MTVET), Kathmandu University

The MTVET program was started in August 2018 after discussing with different stakeholders including representatives of the government, CTEVT, TVET providers, private sector industries, prospective students, and other TVET professionals. It has emerged as one important program for preparing TVET professionals. The 15 students of the first cohort completed their studies in September 2020. The students' theses and research papers, part of their course requirements, contribute to the academic and

practice-oriented literature on TVET in all of their home countries. The MTVET program has integrated technical education in an academic stream, and is intended to be a model for similar programs elsewhere in the world. A study was conducted to capture the MTVET students' perspectives and feedback for improving the quality and relevance of the program.

Through the LELAM project and the MTVET program, Kathmandu University is developing into a knowledge center on TVET. PhD and Postdoc scholars at the university are doing their research on TVET areas, especially in TVET financing, informal skills, and linkage between education and employment. While these scholars will be prepared as high-level experts in the sector, the academic outputs they have produced and continue to produce make important knowledge and policy contributions.

5.2.3 CEMETS Economic Policy Development Research Program for Education Reform Leaders

The CEMETS (Center on the Economics and Management of Education and Training Systems) Summer Institute is part of its economic policy development research program for education reform leaders. The purpose of the program is to serve as a pathway to impact for TVET research. CEMETS institutes are also a key component of this project. All of the project partner countries have sent teams of leaders to the annual summer institute since at least 2017, so each country has at least three cohorts of program participants.

During the annual institute, participants work on a reform case within their team as they join a cohort of approximately ten education-leadership teams from around the world. Participants hear lectures on key research results from leading scholars in the field, from LELAM-project partners, visit Swiss TVET training sites, and hear from keynote speakers discussing their experience with specific aspects of TVET systems and TVET reform. The team’s reform case is at the center of the institute, so each team presents its case and participates in discussion of all other cases. At the end of the institute, each team leaves with a reform implementation plan. Teams follow up on their progress and get a final round of feedback three months after the institute’s completion.

Teams from all four partner countries participating in the institute have worked on plans for legislation, for industry-actor strategies, and for implementation of ongoing and new reforms. Benin’s cases have generally focused on the implementation of the CQP program and its extension project to further craft occupations and the agricultural sector. This formalization of the traditional apprenticeship shows much promise in terms of education-employment linkage. Chile’s cases have focused on bringing together fragmented stakeholders, developing a TVET strategy for the country, and finding employer leadership for TVET. In Costa Rica, new laws have been discussed and considered and the roles of key apprenticeship players have been re-evaluated with the consequence that the institutional fragmentation must be overcome in order to arrive at an actual TVET system. Nepal’s reform cases have focused around the new constitution, a TVET umbrella act, the need of a financial flow analysis and how industry stakeholders can become players in the dynamic new TVET space.

For Chile, CEMETS has been particularly important to make attendees to understand deeply the problems of the TVET in Chile, and the role of the stakeholders in the system. The lack of linkage of the education sector with the labour market sector explains mostly the low quality and lack of pertinence of the TVET sector in Chile. Understanding the role of social institutions of the education system as a whole has made CEMETS alumni to understand the challenges and reform paths that will need to be considered in Chile to improve the TVET system.

In an upcoming impact evaluation of the CEMETS institutes, we are investigating the measurable impact of the institutes on individuals that attended, the projects they have worked on, and the places they represent.

CEMETS Testimonial from Prof. Dr. Jacqueline García Fallas and Silvia Camacho Calvo, LELAM Team Costa Rica

In Costa Rica, CEMETS has been a space that has allowed recognizing the opportunities of TVET in Costa Rica, strategically positioning it for the social and human development of the country. This also helped identifying vulnerabilities, gaps and the actions carried out, for which reason it has been possible to raise a route to influence politically in an educational reform in TVET.

Costa Rica began its participation in the CEMETS summer course in 2017 and since then has participated every year, with a single objective: to transform technical education in the country. Since the beginning, this course has served to guide, validate, strengthen and clarify the interest raised from the beginning by our country, to develop an integrated, flexible and permeable system for this transformation.

In this way, in 2017, representatives of Costa Rica's Ministry of Public Education and the National Institute of Learning participated with a focus on the new educational policy and the curricular approach within the framework of the question: What measures can the country implement to transform TVET towards a more flexible organizational structure that teaches 21st century skills and improves relationships with different actors? The course discussions, visits to different entities in Switzerland, and knowledge of experiences from Switzerland and other countries served as a basis to advance the design of the desired transformation.

In 2018, participation corresponded to the Higher Council of Education (maximum body for the direction of Costa Rican education) and the National Learning Institute with the theme of Elaboration of a national curricular structure to guide the implementation of DUAL Quality and the question: What aspects should DUAL Education have in Costa Rica? In this sense, the experience in the CEMETS course served to clarify matters related to the implementation of DUAL Education under the transformation we seek from Technical Education.

In 2019, there were representatives of the Ministry of Public Education and the Business Alliance for Development (AED) under the topic Generation of a TVET System in Costa Rica and the question: How to position a strategic vision on the importance of a system of TVET, which has a clear definition of roles? In this sense, the inputs received in the course served to adequately narrow that necessary link between the business sector and formal education.

By 2020 the country participates again in virtual and face-to-face mode. The course will presented the Ministry of Public Education, the National Learning Institute, and the University of Costa Rica will continue with the topic on the reform of the System of Education and Technical Training in Costa Rica and the question: How to consolidate the continued improvement of the TVET System in Costa Rica? The team will analyze the law on the reform of the TVET system in this framework.

Over the years, the course has been of great value to the country, as a space for feedback on the ambitious task that Costa Rica has of transforming vocational and technical education. All this considering the harmonious, flexible and permeable integration of the different training options and the participation of the various entities involved, which are the formal and non-formal educational system, the political decision-making bodies, and the business world.

5.3 Summary of contributions and link to overarching research question

No matter how well conceived a reform project is and how clearly it articulates the goals of improving youth labor market outcomes through TVET improvement, implementation is always a challenge. Evidence is necessary to identify what characteristics of a reform, resources, stakeholders, context

factors, and other elements increase the probability of successful reform implementation so that the outcomes for youth may be improved. Below, we briefly describe the key achievements of the project for the fourth research question, as they relate to the overarching research question of the LELAM project.

Under what conditions can TVET reduce unemployment, improve employment, quality of work and thus the income of the youth? – Intermediary Conclusions

- Under the condition that evidence for scaling up strategies exist, TVET can improve the situation of the youth. Evidence from **Nepal** shows that **scaling up programs** may present different or additional challenges that add on to the challenges of initial implementation, such as understanding the financial flows for formal TVET programs.
- Further results from **Nepal** shows that, although actors are committed and resource capacity is sufficient, companies lack information about the program. Industry associations may help resolve this issue. T**he most challenging implementation barrier is that the program represents a substantial change** compared to existing TVET programs.
- **Research evidence** that increases the visibility of problems with existing TVET programs and systems is an enabling factor for successful implementation of TVET reforms, as demonstrated by the experiences of **Benin** and **Chile**.
- **Foreign partners can have at least two productive roles** in supporting the implementation of TVET reforms: they can provide funding as in **Benin** and provide information as is done at the CEMETS institutes and demonstrated by the experience of **Costa Rica**.
- Initial evidence suggests that **direct and structured communication from researchers** about evidence-based best practices, research findings, and key features of effective TVET programs can contribute to implementation of incremental improvements in TVET programs and systems.

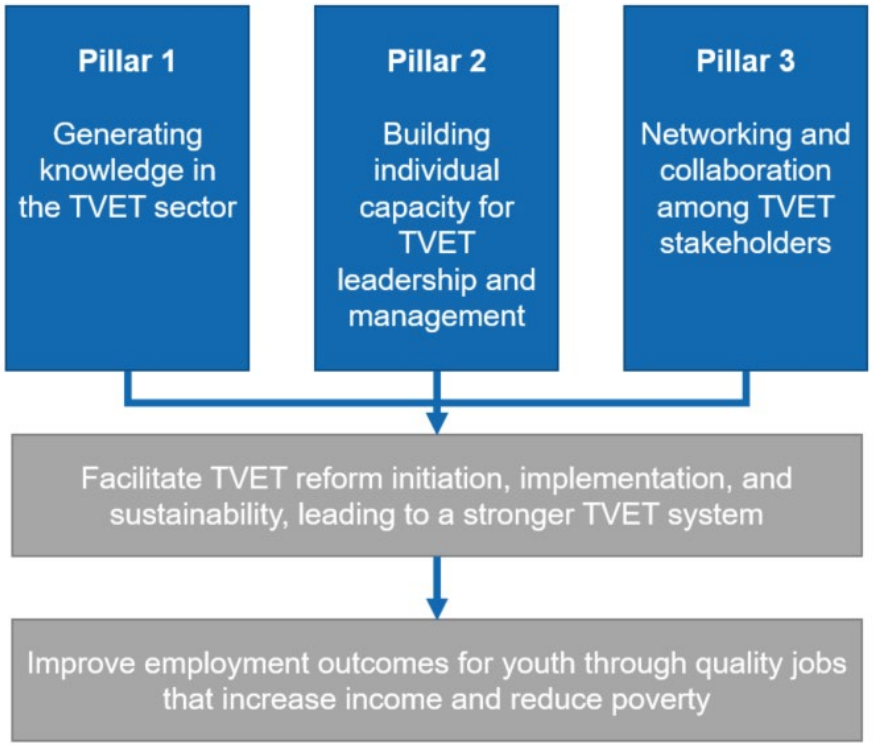
5.4 Output and future research plan

The LELAM project is focused not just on scientific advancement but also impact and practical outcomes for TVET systems and the income of youth. TVET reforms need to be implemented—not just designed—in order to succeed at improving outcomes. Therefore, the contributions related to this research question take the form of concepts and actions as well as scientific publications. We anticipate more publications related to this research question in the second half of the project as reform implementation proceeds and more evidence becomes available.

5.4.1 Action outcomes

Nepal's three-pillar approach to TVET system improvement reflects the relationship between the LELAM project, related efforts, and the impact of TVET on unemployment, job quality, and the income of youth. In Nepal, LELAM and MTEVT activities contribute to a three-pillar approach to developing a TVET system in Nepal. The first pillar – knowledge generation in the TVET sector, has contributed to identifying the gaps and ways of bridging those gaps. The second pillar – building individual capacity for understanding and improving TVET, is focused on developing effective TVET leadership and system management. The third pillar – networking and collaboration among TVET stakeholders, facilitates reform initiation, implementation, and sustainability based on the knowledge developed in the first pillar and the capacity developed in the second pillar. Hence, the combined contribution of these three pillars has been moving towards improving the gainful employment situation for the youth through quality jobs that help increase incomes and reduce national poverty.

Figure 4: Three-pillar approach to improving outcomes for youth



Under this framework, the LELAM project has contributed to a number of reform implementation action steps that are part of the process towards improved TVET and improved outcomes for youth. Most of these actions are generated through teams' participation in CEMETS institutes, which build individual capacity, support networking among TVET stakeholders, and increase knowledge in the TVET sector. The CEMETS institutes also require annual action plans for the implementation of next steps, and these have contributed to concrete changes in partner countries like the continued implementation of the CQP in Benin, the establishment of new inter-institutional collaboration in Chile, the Thematic Observatory for Education and Professional Technical Training in Costa Rica, and in creating a discourse that promotes a federalized governance structure and the meaningful involvement of the private sector (including the development of an industry action plan) in Nepal. Legislative changes in all four partner countries have built on the planning made at the CEMETS institute, including the law reforming TVET in Costa Rica.

5.4.2 Research outcomes

The LELAM project is primarily a research project, so research is also a key output. Most of the outputs in Phase 1 are action steps where partner countries design and begin to implement key TVET reforms. Phase 2 of the project will investigate the success factors and barriers to the implementation of these reforms, the measurement of those factors, the criteria for assessing implementation progress, and the role of foreign and development-oriented actors in supporting reform implementation.

Table 4: Research output, Research Question 4

Year	Authors	Title	Type
2019	Bolli, Parajuli, Kemper, Renold, Thapa	First Report on the Dual VET-Apprenticeship Programme in Nepal: Formative Assessment of the First Cohort	LELAM Working Paper (No. 5)
2020	Bolli, Parajuli, Kemper, Renold, Thapa	Drivers and Barriers of Scaling-Up the Dual VET Apprenticeship Programme in Nepal	LELAM Working Paper (No. 11)
2020	Paudel, Acharya, Parajuli	Students' perspective on the Master in Technical and Vocational Education and Training Program in Nepal	LELAM Working Paper (No. 16)
Forthcoming	Aryal	Financing of Technical and Vocational Education and Training (TVET) in Nepal	Manuscript under review
Forthcoming	Multiple	Special issue of the *Journal of Education and Research* with selected articles from the International Conference on TVET	In preparation
Forthcoming	Caves, Lueling, Renold	Impact evaluation of CEMETS summer institutes 2015-2019	Manuscript in preparation

6 Conclusion

Throughout its first phase, the research and policy progress of the LELAM project has been driven by the desire to provide an answer to the question *Under what conditions can Technical Vocational Education and Training (TVET) improve the income of the youth?* In order to do so, it has used four concrete research questions to provide the impetus for answering the overarching research question. In this synthesis paper, we have provided a summary of our main findings up to date, and how this research and stakeholder interaction has contributed to our understanding of how TVET systems function in different contexts, and how it can contribute to better labor market outcomes for youth. We have also outlined where work will continue through the second phase of the project. Here, we provide a summary of the key contributions emanating from all four research questions in order to synthesize what we have learned so far from the LELAM project.

Under what conditions can TVET reduce unemployment, improve employment, quality of work and thus the income of the youth?

- **Strong social institutions** governing functions and processes make an important contribution to many successful TVET programs. However, social institutions are poorly defined and are likely to vary across contexts. We have developed a framework for measuring social institutions in TVET programs so that they may be better analyzed and compared across contexts.
- **Formalizing existing, trusted programs** may be a path to creating reliable TVET programs with positive outcomes. However, care must be taken that TVET is not seen as a "second-class" option, nor that it funnels apprentices into mostly informal positions with bad working conditions.
- **Unemployment rates are not necessarily the best indicators of labor market quality** for young workers, especially in low and middle-income countries. The Youth Labor Market Index was developed to provide a broader overview of the labor market situation in these contexts. It shows that different indicators are not necessarily correlated and therefore accounting for a broad range of indicators is important when considering labor market outcomes for youth.
- **Combining classroom and on-the-job training within one formal program** provide the best outcomes, at least in the short-term. Such programs require strong links and trust between education and employment sectors, which is lacking in many TVET systems.
- **While initial implementation is important, scaling up programs is an equally important and difficult step** that presents different challenges and requires a different focus.
- **Communication channels and networks** among stakeholders are key aspects of successful TVET programs as they allow for continual discussion and development of up-to-date policies and practices.

Where do we go from here? While much of the theoretical and measurement framework development has been to a large level completed in the first phase, empirical analysis and stakeholder outreach loom as especially important in the second phase. Some trends that we see in some countries may not be replicated in others and as such, we need more concrete empirical information in order to confirm these trends. This is important both in terms of our understanding of TVET outcomes and how they are linked to TVET system characteristics, but also to the implementation of new programs designed to improve outcomes for youth employment. For instance, new projects such as ENSSURE in Nepal require further assessment, as do ongoing programs such as Training in the Workplace in Chile. Further waves of the youth survey in Benin will inform us about long-term effects of TVET, and improved and increasing linkage and communication between actors in Costa Rica, facilitated by UCR, will be assessed for its impact on labor market outcomes. Moreover, as with all research in the current pandemic situation, the

impacts of COVID-19 are likely to be profound in the LELAM partner countries. How this will affect the research agenda will be an ongoing issue for the second phase.

The LELAM project has in its first phase contributed greatly to our knowledge of TVET systems in low- and middle-income contexts, as well as provided guidance, support and assessment capabilities for the implementation of new programs and projects in Benin, Chile, Costa Rica and Nepal. It is in a unique position to continue having a positive impact on the development of TVET systems, and therefore on improving outcomes for young people entering the workforce in an uncertain era.

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8 Appendix

8.1 Detailed publication list

Year	Authors	Title	LELAM Working Paper Series	Journal submission	Submission status
2019	Bolli, Parajuli, Renold	Has the relationship between formal education and the formal employment sector in Nepal changed between 1995 and 2014? (Published title: Changes in the relationship between formal education and formal employment sector in Nepal between 1995 and 2014)	No. 1	Yes: *Journal of Education and Research*	Published: Vol. 9(2), 49-73..
2019	Renold, Rageth, Caves, Bürgi	Theoretical and Methodological Framework for Measuring the Robustness of Social Institutions in Education and Training	No. 2	Yes: as two separate papers to the *American Journal of Sociology* ("Operationalizing Institutions: A Theoretical Framework and Methodological Approach for Assessing the Robustness of Social Institutions") and *Journal of Public Administration Research and Theory* ("Measuring the Robustness of Social Institutions in Education and Training", working title)	AJS: Under review JPART: Submission planned
2019	Caves, Ghisletta, Kemper, Renold	Meeting in the middle: TVET programs' education-employment linkage in developing contexts	No. 3	Yes: *Empirical Research in Vocational Education and Training*	Under review
2019	Baral	Positioning Informal Skills Learners in Nepal's TVET System.	No. 4	Yes: *Journal of Education and Research*, TVET Special Issue	Under review
2019	Bolli, Parajuli, Kemper, Renold, Thapa	First Report on the Dual VET-Apprenticeship Programme in Nepal: Formative Assessment of the First Cohort	No. 5	No, serves as a background paper	N.A.

Year	Authors	Title	LELAM Working Paper Series	Journal submission	Submission status
2019	Peralta Rojas, Bordón Tapia, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Chile*	No. 6	Yes: *International Journal for Research in Vocational Education and Training*	Submission planned
2019	Baral, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Nepal.*	No. 7	Yes: *International Journal for Research in Vocational Education and Training*	Submission planned
2019	Cannacho-Calvo, García-Fallas, Kemper, Maldonado-Mariscal, Vargas-Porras	Country Case Study on Technical Vocational Education and Training (TVET) in Costa Rica*	No. 8	Yes: *International Journal for Research in Vocational Education and Training*	Submission planned
2019	Nouatin, Bankole, Gandonou, Kemper, Maldonado-Mariscal	Country Case Study on Technical Vocational Education and Training (TVET) in Benin*	No. 9	Yes: *International Journal for Research in Vocational Education and Training*	Submission planned
2019	Parajuli, Renold, Bhandari, Lamsal	Financial Flow in TVET in Nepal: Transiting from the Old to the New Constitution	No. 10	Yes: *Emerging Economy Studies* or *Public Works Management & Policy*	Submission planned
2020	Bolli, Parajuli, Kemper, Renold, Thapa	Drivers and Barriers of Scaling-Up the Dual VET Apprenticeship Programme in Nepal	No. 11	Yes: *Journal of Public Administration Research and Theory*	Submission planned
2020	Bolli, Parajuli, Kemper, Renold, Thapa	Projection of Net Benefits for Companies in the Dual VET-Apprenticeship Programme in Nepal	No. 12	Yes: *Journal of Vocational Education and Training*	Submission planned
2020	Kudrzycki, Günther, Lefoll	Youth Labor Market Index for Low Income Countries	No. 13	Yes: *World Development*	Accepted: Available online in October 2020, published in December 2020.

Year	Authors	Title	LELAM Working Paper Series	Journal submission	Submission status
2020	Kudrzycki, Günther, Kpenavoun Chogou, Bankolé	The Working Lives of 1250 Urban Youth in Benin	No. 14	Yes: *UNU-WIDER publication*	Accepted: To be published in January 2021
2020	Nouatin, Gandonou, Bankole, Renold	Reforms of Technical Vocational Education and Training system in Benin: An exploration of social anthropological field	No. 15	Yes: *International Journal of Educational Reform*	Under review
2020	Paudel, Acharya, Parajuli	Students' perspective on the Master in Technical and Vocational Education and Training Program in Nepal	No. 16	Yes: *Journal of Education and Research*	Submission planned
2020	Baral	Developing a Typology of Informal Skills Learning Places in Nepal.	No. 17	Yes: *Journal of Training and Development*	Under review
2020	Bankole, Nouatin, Gandonou	The Dual Apprenticeship in Benin: Strategic Actors and Roles	No. 18	Yes: *Mélanges en l'honneur du Professeur Titulaire Emérite Albert J. Nouhouayi* (book chapter)	Published : pp. 537-557.
2020	Peralta, Quiero, Canals, Maldonado	The effects of Professional Technical High School Education when applying to study for STEM undergraduate degrees at Chilean universities. A causal analysis based on observational data.	No. 19	Yes: *Calidad en Educación*	Submission planned
2020	Camacho-Calvo	Nociones y prácticas evaluativas basadas en el enfoque por competencias implementado en los Colegios Técnicos Profesionales de Costa Rica (Notions and evaluation practices based on the approach for competences implemented in the Professional Technical Colleges of Costa Rica).	N.A.	Yes: *Revista Actualidades Investigativas en Educación,*	Published: 20(2), 1-36.

Year	Authors	Title	LELAM Working Paper Series	Journal submission	Submission status
2020	Camacho-Calvo, Hilje-Matamoros, Rodríguez-Ríos	Un acercamiento a la formación por competencias en la educación técnica costarricense (An approach to training by competences in Costa Rican Technical Education).	N.A.: INIE-UCR Publication		
2020	Bankolé, Nouatin	Dual apprenticeship in Benin: Between theory and practice	N.A.	Yes: *African Educational Research Journal*	Published: 8(1): 46-56.
2020	Nouatin	Role of professional associations in the dual apprenticeship in Benin	N.A.	Yes: *Journal of Education and Research*	Under review
2020	Aryal	Financing of Technical and Vocational Education and Training (TVET) in Nepal	N.A.	Yes: *Journal of Education and Research*	Under review
Forthcoming	Günther, Kudrzycki, Gandonou, Kpenavoun Chogou	The Effect of Adding Formal Education to Informal Apprenticeships: The case of the Certificat de Qualification Professionnelle (CQP)	Manuscript in preparation	Yes: *Development Studies*	Submission planned
Forthcoming	Ghisletta, Kemper, Stöterau	Untitled meta-analysis	Manuscript in preparation	Yes: *World Development Journal*	Submission planned
Forthcoming	Camacho-Calvo, García-Fallas	Descriptive analysis of the number of students who graduate from Professional Technical Colleges of the MEP and who enter the University of Costa Rica, the National University, the National Technical University and the State Distance University.	Manuscript in preparation	TBD	TBD
Forthcoming	Camacho-Calvo, García-Fallas	Preliminary findings of the implementation of the dual education pilot plan in the Automotive specialty in the Professional Technical Colleges in Costa Rica: the students' voice.	Manuscript in preparation	TBD	TBD

Year	Authors	Title	LELAM Working Paper Series	Journal submission	Submission status
Forthcoming	Caves, Lueling, Renold	Impact evaluation of CEMETS summer institutes 2015-2019	Manuscript in preparation	TBD	TBD
Forthcoming	Multiple	Special issue of the *Journal of Education and Research* highlighting selected articles from the International Conference on TVET	In preparation	Special issue of *Journal of Education and Resarch*	Forthcoming
Forthcoming	Camacho-Calvo, García-Fallas	How to build political advocacy for an educational reform in technical and vocational education from research-action? The case of Costa Rica.	Manuscript in preparation	TBD	TBD
Forthcoming	Bankolé, Nouatin	Social transformations in Benin crafts sector through the competence-based approach of dual apprenticeship.	Manuscript in preparation	Yes: *International Review of Education – Journal of Lifelong Learning*	Submission planned

**** Country case studies will be published in a compliation for local pratcitioners. Translation into local languages is planned.***

8.2 Additional figures and tables for chapter 3

A Youth Labor Market Index construction

Dimension		Indicator	Weight of dimension	Weight of indicator
Transition	1.	Share of youth NEET	1/3	1/9
	2.	Relative unemployment ratio		1/9
	3.	Youth skills mismatch rate		1/9
Working conditions	4.	Youth working poverty rate	1/3	1/18
	5.	Youth time-related underemployment rate		1/18
	6.	Share of youth in informal employment		1/18
	7.	Youth vulnerable employment rate		1/18
	8.	Share of youth working in elementary occupations		1/18
	9.	Share of youth working in skilled agriculture, fishery or forestry		1/18
Education	10.	Share of youth with no secondary education	1/3	1/9
	11.	Youth Illiteracy rate		1/9
	12.	Harmonized test scores		1/9

B Youth Labor Market Index rankings

Country		Region	YLILI	Transition	Working conditions	Education	GDP per capita	Unemp. rate	Rank. YLILI	Rank. GDP per capita	Rank. unemp. rate
Ukraine	UKR	ECA	81.38	89.94	77.76	76.45	9233.15	17.95	1	7	43
Moldova	MDA	ECA	79.96	86.19	84.88	68.80	7271.64	10.41	2	17	31
Cambodia	KHM	EAP	77.85	96.20	69.84	67.51	4360.85	1.11	3	28	1
Kyrgyzstan	KGZ	ECA	76.64	85.49	65.68	78.76	3884.71	9.55	4	33	29
Mongolia	MNG	EAP	76.64	85.96	77.65	66.29	13799.90	25.27	5	1	55
Viet Nam	VNM	EAP	76.23	80.10	73.99	74.59	7447.81	6.85	6	15	17
West Bank & Gaza	PSE	MENA	75.22	85.28	75.09	65.27	5157.57	40.16	7	23	63
Nicaragua	NIC	LAC	73.47	91.51	67.75	61.14	5533.55	8.46	8	22	23
Tunisia	TUN	MENA	73.06	84.53	74.14	60.52	12502.82	35.04	9	3	62
Nepal	NPL	S. Asia	72.65	82.70	70.61	64.64	3089.56	21.36	10	42	51
Philippines	PHL	EAP	72.65	80.02	74.30	63.63	8951.09	6.67	11	8	15
Myanmar	MMR	EAP	71.52	86.67	64.52	63.39	6674.03	1.97	12	18	3
Eswatini	SWZ	S. Africa	70.46	79.22	72.27	59.89	10637.84	47.06	13	5	65
Honduras	HND	LAC	70.09	83.13	65.65	61.50	5138.75	10.66	14	24	32
El Salvador	SLV	LAC	70.07	79.97	74.68	55.55	8331.80	9.61	15	11	30
Indonesia	IDN	EAP	69.33	67.94	70.28	69.78	13079.62	16.25	16	2	38
Comoros	COM	E. Africa	69.10	83.82	65.74	57.73	2913.39	19.47	17	44	46
Zimbabwe	ZWE	E. Africa	68.80	91.52	49.30	65.57	3029.79	6.83	18	43	16
Cameroon	CMR	C. Africa	67.29	87.40	56.94	57.51	3785.08	6.29	19	34	14
Burundi	BDI	E. Africa	66.75	92.07	51.70	56.49	744.18	2.94	20	68	6
Lao PDR	LAO	EAP	66.55	80.41	62.05	57.18	7439.60	18.18	21	16	44
Ghana	GHA	W. Africa	66.17	78.46	62.87	57.20	4746.68	9.07	22	26	26
Bangladesh	BGD	S. Asia	66.07	74.89	68.25	55.06	4371.75	12.76	23	27	34
Egypt	EGY	MENA	65.90	75.57	73.55	48.57	12412.31	29.55	24	4	59
Togo	TGO	W. Africa	65.29	79.32	58.26	58.30	1773.90	9.51	25	60	28
Zambia	ZMB	E. Africa	64.69	78.73	59.32	56.01	4223.91	25.97	26	30	57
Mauritania	MRT	W. Africa	64.12	79.44	73.03	39.90	4150.97	21.15	27	32	50
Rwanda	RWA	E. Africa	63.59	87.44	55.65	47.68	2251.56	20.62	28	51	48
Uganda	UGA	E. Africa	63.48	82.21	55.11	53.13	2038.07	15.27	29	52	37
Senegal	SEN	W. Africa	63.17	83.98	54.26	51.28	3782.54	8.05	30	35	22
Pakistan	PAK	S. Asia	63.13	79.45	67.25	42.69	5567.06	7.85	31	21	21
Timor-Leste	TLS	EAP	62.65	74.33	52.33	61.28	7658.43	13.19	32	14	. 35
Tanzania	TZA	E. Africa	61.83	84.45	51.32	49.71	3227.03	3.89	33	39	10
Liberia	LBR	W. Africa	61.81	95.48	51.46	38.48	1308.63	2.30	34	64	4
Madagascar	MDG	E. Africa	61.15	89.10	41.72	52.62	1891.32	3.44	35	57	7
Sierra Leone	SLE	W. Africa	60.92	90.51	48.33	43.92	1601.97	9.45	36	61	27
Gambia	GMB	W. Africa	60.86	72.10	64.40	46.08	2612.00	25.80	37	45	56
Congo DR	COD	C. Africa	60.78	84.99	44.32	53.04	932.17	8.68	38	66	24
Malawi	MWI	E. Africa	60.04	86.26	52.48	41.38	1311.00	40.50	39	63	64
Côte d'Ivoire	CIV	W. Africa	58.95	79.19	57.42	40.23	4207.09	5.52	40	31	12
Ethiopia	ETH	E. Africa	58.89	89.43	48.26	38.97	2022.14	3.53	41	53	8
Benin	BEN	W. Africa	58.76	82.44	48.66	45.16	2424.76	5.63	42	47	13
Angola	AGO	C. Africa	58.47	75.36	52.02	48.03	6452.36	16.71	43	19	40
Mozambique	MOZ	E. Africa	56.97	70.53	56.22	44.16	1459.70	7.41	44	62	20

C Summary statistics by gender, Benin Youth Survey

Education by gender

Variable	Female	Male	Overall
Years of schooling, m (sd)	10.89 (5.45)	12.95 (4.30)	11.85 (5.05)
Completed apprenticeship, %	21.9	20.78	21.38
Highest education level, %			
None	12.19	3.38	8.09
<Primary	11.06	8.31	9.78
Primary	11.96	8.31	10.27
Collège	23.02	21.3	22.22
Lycée	20.32	26.49	23.19
Tertiary	21.44	32.21	26.45
Diplomas, %			
CEP (primary)	75.39	87.53	81.04
BEPC (secondary, 1st cycle)	55.76	71.17	62.92
BAC (secondary, 2nd cycle)	28.89	45.45	36.59
License (undergraduate)	10.16	18.18	13.89
Graduated apprenticeship, %	21.9	20.78	21.38
Father was apprentice, %	32.28	32.21	32.25
Mother was apprentice, %	16.93	15.58	16.3

Assets by gender

Variable	Female	Male	Overall
Living situation, N (col%)			
Renting	83 (18.7)	133 (34.5)	216 (26.1)
With parents	173 (39.1)	185 (48.1)	358 (43.2)
With spouse	146 (33.0)	2 (0.5)	148 (17.9)
With other family	31 (7.0)	46 (11.9)	77 (9.3)
Owner of residence	1 (0.2)	2 (0.5)	3 (0.4)
Other	9 (2.0)	17 (4.4)	26 (3.1)
Rooms in home, m (sd)	3.61 (2.16)	3.65 (2.24)	3.63 (2.19)
Home electrified, %	92.33	91.95	92.15
Private latrine, %	94.58	95.58	95.05
Asset ownership, %			
Cell Phone	75.39	76.1	75.72
Smartphone	43.79	60	51.33
Computer	12.64	21.3	16.67
Bicycle	1.58	1.82	1.69
Motorcycle	16.93	37.4	26.45
Car	2.71	2.86	2.78
Radio	38.6	43.38	40.82
Television	38.37	39.22	38.77
Table and chair	48.08	51.69	49.76