

A ticket up and a ticket out

Promoting and ensuring permeability in education system reform

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List of Abbreviations

CES	Chair of Education Systems at D-MTEC ETH Zurich
ISCED	International Standard Classification of Education
LELAM	Linking Education and Labor Markets: Under what conditions can Vocational Education and Training improve the income of the youth? (LELAM-TVET4Income)
NSTB	National Skills Testing Board (Nepal)
NVQS	National Vocational Qualification System (Nepal)
PET	Professional Education and Training
RPL	Recognition of Prior Learning
R4D	Research on Global Issues for Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
VET	Vocational Education and Training
VPET	Vocational Professional Education and Training
VPETA	Vocational and Professional Education and Training Act
YLMI	Youth Labor Market Index

Introduction

Development aid for better education often focuses on the introduction or improvement of individual programs. These approaches are often favored because they allow for simple and clear evaluation of impact. On the other hand, these measures require a very long-term commitment and a lot of financial support before an effective program emerges from a pilot project. More importantly, however, focusing on individual programs does not account for the importance of the system perspective. The structure and permeability of the education system as a whole defines the value of every program it comprises.

Switzerland has been committed to improving vocational education and training (VET) in developing countries for many years. These reforms are far more complex than in general education because they require collaboration between actors in the education and employment systems. In most countries, VET has a poor image because—unlike the Swiss education system—it lacks the further education and training opportunities at the system level that make any education program attractive.

This report illustrates how the permeability of the education system as a whole affects every program in the education system and key outcomes like attractiveness, equity, and meeting labor market skills demand. Every program must offer progression routes up and out of the education system to enable lifelong learning, upskilling, and further educational opportunities. Permeability—the availability of diverse education and training programs and access to those programs—is important for key education outcomes like equity, program attractiveness, inclusive development, and supporting economic development.

Education system permeability is not the most historically obvious approach to development work. Traditionally, most of the effort in education reform for development has focused on increasing access to education and the quality of existing programs. Globally, enormous strides have been made in both areas. In 1970, around 28% of children were not attending primary school, this number had dropped to 8% by 2021¹. Literacy levels have also been rising drastically throughout the past centuries, in 2016 only 4% of the population was reported to be illiterate compared to 88% in 1820². However, as the world approaches universal access to education, major problems are appearing with equity and with the match between the skills taught by education and those individuals need to pursue productive and desirable employment. This has consequences for both individual life outcomes and for economic development.

¹ Roser, M. (2021). Primary and secondary education. Published online at OurWorldInData.org.

² Roser, M., & Ortiz-Ospina, E. (2016). Literacy. Published online at OurWorldInData.org.

A permeable education system has both access and opportunity. All programs are accessible to interested individuals and progression routes facilitate transitions. At the same time, there are multiple pathways at all levels providing academic education as well as vocational and professional education and training (VPET). We show in this report how both components of permeability are necessary to address the challenges that access alone cannot resolve. At the very least, an education system cannot have full access if it is lacking the VPET pathway.

Switzerland's fully permeable education system has developed over a period of multiple reforms since the 1970s³ and its permeability is one of its defining features. Young people in Switzerland can progress from any starting point to any endpoint, meaning that the system has no dead ends. Young people can start, for example, with an apprenticeship at the upper-secondary level and eventually earn a PhD. Evidence shows that VET is a better option for approximately 90% of young people compared to academic upper-secondary education⁴, and indeed the majority of Swiss young people pursue that option. Evidence also shows that Swiss young people who pursue VET have an initial advantage and then similar wages and lower risk of unemployment in the long term compared to their academic peers with the same years of education⁵. Finally, the students in Switzerland who take advantage of the system's permeability and pursue mixed education paths—educational careers that include both the academic and VPET pathways—are the best performers in terms of wages and employment⁶. Outcomes from Switzerland demonstrate the power of permeability.

We have organized the report in a series of linked modules that build upon each other. Each module covers an important aspect of permeability.

Acknowledgements

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³ See the Switzerland Factbook at CES Factbooks Education Systems: <https://ces.ethz.ch/publications-and-media/factbook-education-systems.html>

⁴ Balestra, S., & Backes-Gellner, U. (2017). Heterogeneous returns to education over the wage distribution: Who profits the most?. *Labour Economics*, 44, 89-105.

⁵ Backes-Gellner, U., & Geel, R. (2014). A comparison of career success between graduates of vocational and academic tertiary education. *Oxford Review of Education*, 40(2), 266-291.

⁶ Tuor, S. N., & Backes-Gellner, U. (2010). Risk-return trade-offs to different educational paths: vocational, academic and mixed. *International Journal of Manpower*, 31(5), 495-519.

Module 1: Education system permeability

Key Points

- Permeability is **access** and **opportunity**
 - **Access:** individuals can go from any starting point in the system to any end point in the system
 - **Opportunity:** all pathways—at least academic/applied and vocational/professional—reach the highest level of education and training
 - Access and opportunity combine to ensure there are **no dead ends**
 - A **simplified model** is useful for mapping access and opportunity to assess the permeability of an education system
-

1.1 What do we understand by permeability?

Permeability in education systems is two-dimensional, requiring both access and opportunity. Access means that individuals can go from any starting point in the system to any ending point in the system. Access can be thought of as the vertical axis—all about moving up and changing programs. Opportunity means that there are various programs at each education level (e.g., upper secondary or tertiary) so people can attain further and higher education and training up to the highest levels—including in vocational/professional pathways. Opportunity can be thought of as the horizontal axis of the education system. Together, access and opportunity combine to create a permeable education system with no dead ends.

Access is the more obvious element of permeability. A program is accessible when there are progression routes into it from all programs in the previous level of education and when those pathways are clear and regularly used by eligible students. For example, lower-secondary education is typically very accessible, available to any student who completed primary education. In most countries, it is part of compulsory schooling. Selective education programs like bachelor's degrees can also be accessible if the requirements are clear and students who meet the requirements are able to enter the program. At the system level, the system is accessible when all programs are accessible.

Opportunity is often the less-obvious element of permeability in education systems, but it is equally important. Essentially, both the academic and vocational/professional pathways should go all the way to the highest levels of education and training. This is

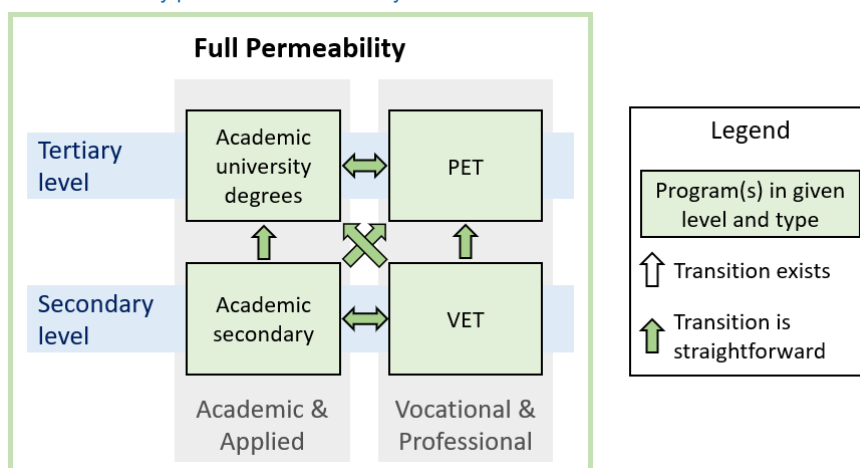
common in the academic pathway, with every education system offering bachelor’s, master’s, and doctoral degrees. However, the vocational/professional pathway should offer equivalent qualifications in a permeable system. Education systems need to have different programs with different objectives so that individuals can attain qualifications relevant for any career goal and human capital needs can be met in the labor market.

1.2 A simplified model of permeability

To illustrate how access and opportunity combine to create permeability, Figure 1 illustrates a fully permeable education system. The illustration is highly simplified to provide a simple and practical framework. The illustration shows only the secondary and tertiary education levels. The ISCED classification articulates nine education levels, seven of them at the secondary level and above.⁷ We have collapsed these into two highly simplified **levels**—secondary, which includes at ISCED levels 3 (upper secondary) and 4, and tertiary, which includes ISCED levels 5-8.

The illustration shows two **pathways** in grey, one for academic and applied education and the other for vocational and professional education and training. Within these pathways at each education level, we find education and training **programs** in green boxes. There may be multiple programs in each box—for example the academic tertiary box includes bachelor’s degree programs, master’s degree programs, and doctoral programs. Each program entails multiple curricula or specialties, like the occupations in VET programs or specializations/majors of university degrees.

Figure 1: Simplified model of a fully permeable education system



In the fully permeable education system, there is at least one program in each level and type of education (opportunity) and there are progression routes enabling individuals to progress from any starting point in the system to any endpoint in the

⁷ UNESCO’s ISCED data offers information on education systems throughout the world. With very few exceptions, all education systems surveyed have a complete general education path up to the postgraduate level. For more information, including the ISCO classification scheme, see

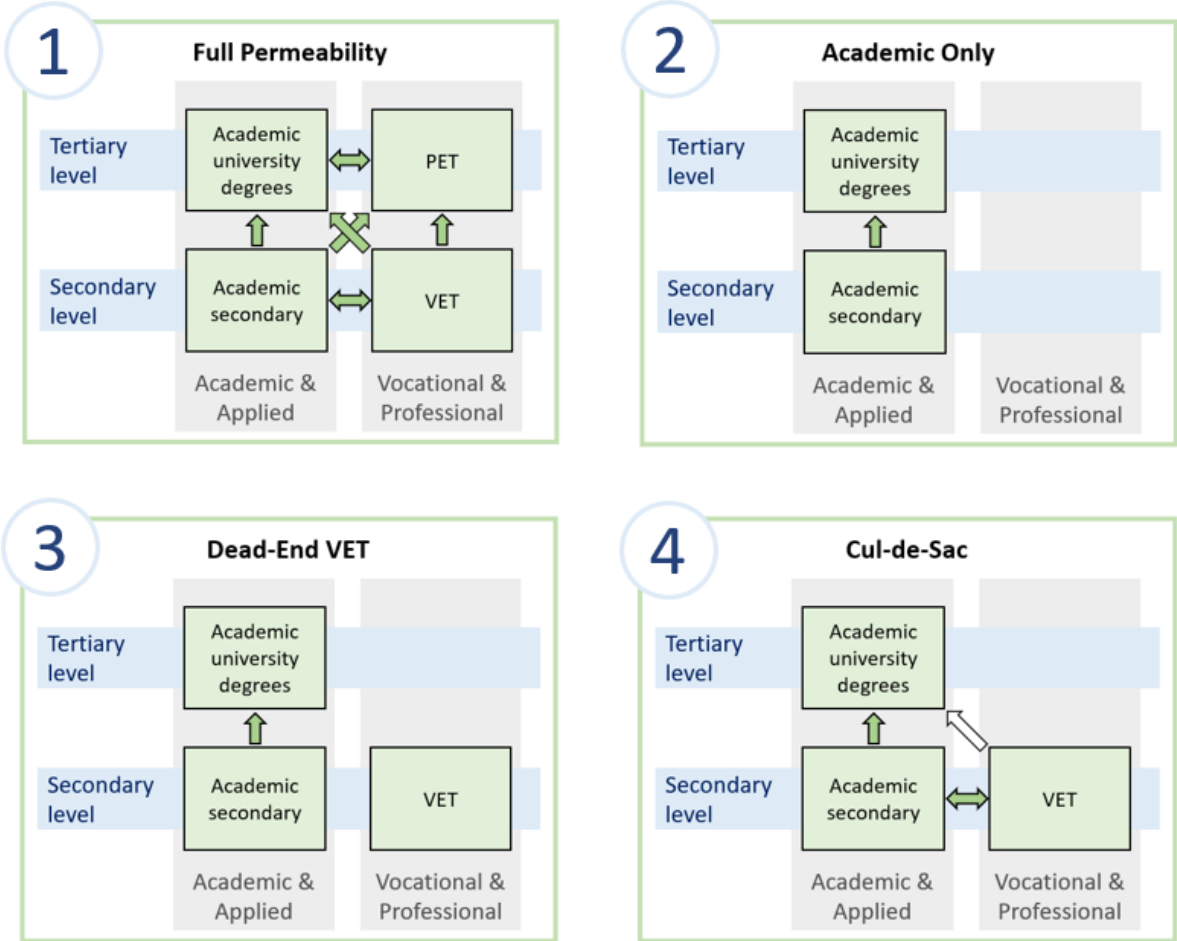
UNESCO (2011). *International Standard Classification of Education: ISCED 2011*. Montreal: UNESCO Institute for Statistics. Available as a PDF: <http://uis.unesco.org/en/files/international-standard-classification-education-isced-2011-en-pdf>

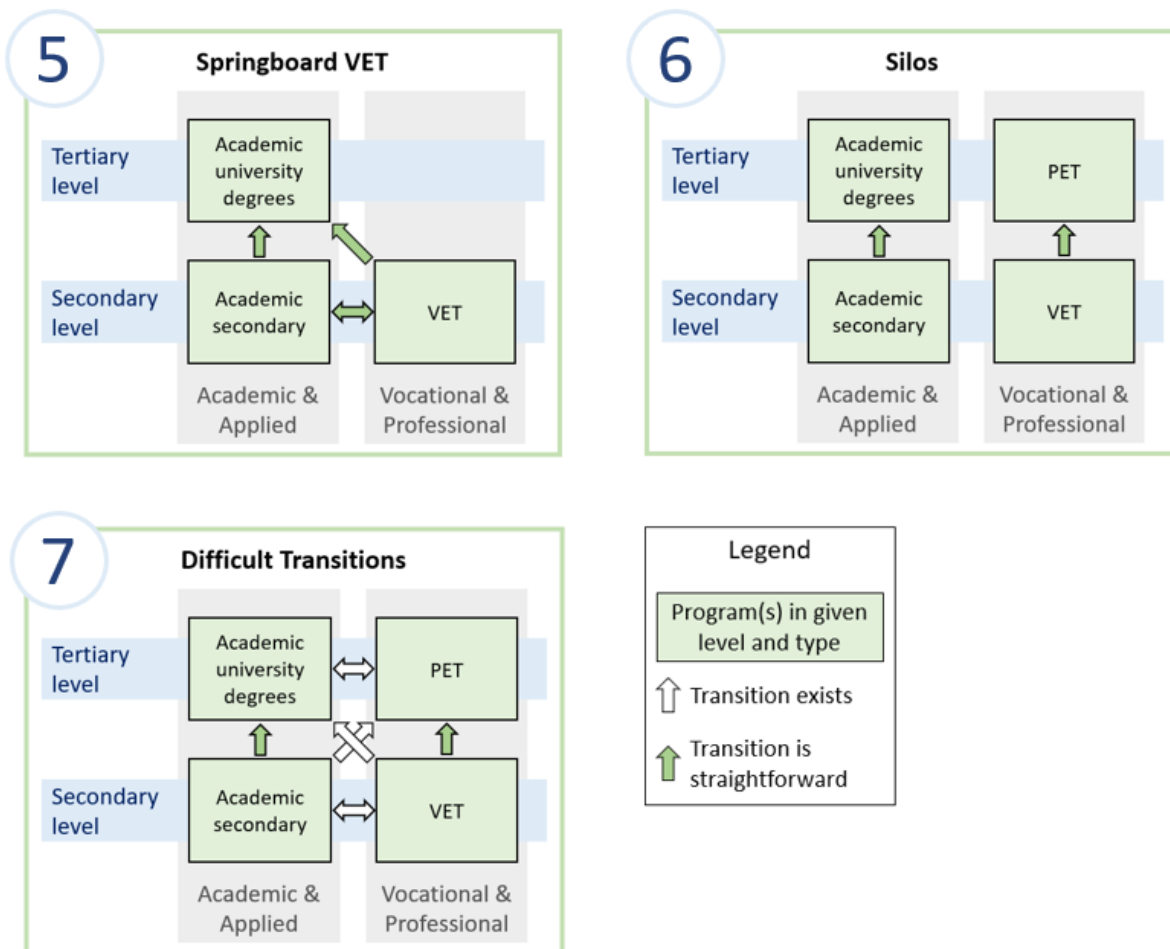
system (access). A fully permeable system also allows individuals to transition to the labor market and return to the formal system to gain higher qualifications later in life. The latter would be of great importance, especially in developing countries, because many have left the education system early to work. To promote lifelong learning, these people should be given opportunities to reconnect with the education system through procedures for the recognition of non-formally and informally acquired educational achievements.

1.3 Permeability types

We can use the illustration to generate a very streamlined set of types that generally diagnose permeability in an education system. We caution readers that these ideal system-types are extremely simple but should help identify the overall level of permeability in a real-world system and identify key areas for improvement. Figure 2 shows all seven permeability types with varying levels of access and opportunity.

Figure 2: Simplified permeability types





Type 1 in Figure 2 represents Full Permeability. There is at least one program at every level and type, and transitions allow progression from any starting point to any ending point. From there, we work approximately from least to most permeable. Type 2 is an Academic-Only system, where there are no vocational and professional programs and therefore also no transitions across pathways. This system is very common—especially if vocational and professional learning opportunities are not part of the formal education system—and has very low permeability. As discussed in Module 2, this has major consequences for equity, individual employment outcomes, and skills availability on the labor market.

Type 3 is Dead-End VET. In these systems, there is a VET option in the formal education system but it is not connected to any other program through a transition route. This makes it a dead end from which students most often cannot progress without re-doing most or all of secondary education in the academic pathway.

Types 4 and 5 are related extensions of Dead-End VET, with gaps in both access and opportunity. In Type 4, the Cul-de-Sac⁸, there is a difficult transition from VET to tertiary academic education but no tertiary or graduate level PET. Students can progress to the next level but probably will need to lose time or repeat some secondary education

⁸ We take the name from a Cul-de-Sac road: a dead-end road with space at the end for turning around.

on the way. Type 5, the Springboard, has a good transition from secondary VET to tertiary academic or applied education—young people can progress straight to the tertiary level without repeating secondary education or losing much time. The Springboard is more permeable than the Cul-de-Sac—which is itself more permeable than Dead-End VET—but all three share the lack of tertiary and graduate PET options. Even the Springboard type does not offer full access because it lacks cross-pathway access at the higher levels. This and the opportunity gap have important consequences for equity and the attractiveness of VET programs, as discussed in Module 2.

Types 6 and 7 are both examples of education systems with full opportunity but limited access. In both types, there are programs at each level and type. In the silo type, there is full within-pathway access but no cross-pathway access. Individuals who wish to change pathways will have to go back and repeat most of one or more levels in order to advance in the new pathway. Type 7—Difficult Transitions—has transitions in place but individuals still lose some time or have to make exceptional effort to change pathways. Both of these create equity gaps, but to a lesser extent than the previous types. Depending on how the systems work, these types may also force the vocational and professional pathway into second-class status, damaging its attractiveness and potentially making it difficult for the education system to match labor market skills demand.

These permeability types are intended to help practitioners in the field identify the overall level of permeability and identify starting points for improvement. They are not detailed enough to be used as a ranking system or standalone evaluation of an education system.⁹ In the next modules we will discuss how gaps in access and opportunity affect key outcomes like equity, VET program attractiveness, and skills matching to the labor market. We will also explore specific drawbacks and advantages and where to start improving system permeability for each type.

⁹ For more detailed descriptions please check our CES Factbooks Education Systems: <https://ces.ethz.ch/publications-and-media/factbook-education-systems.html>

Module 2: VET needs permeability

Key Points

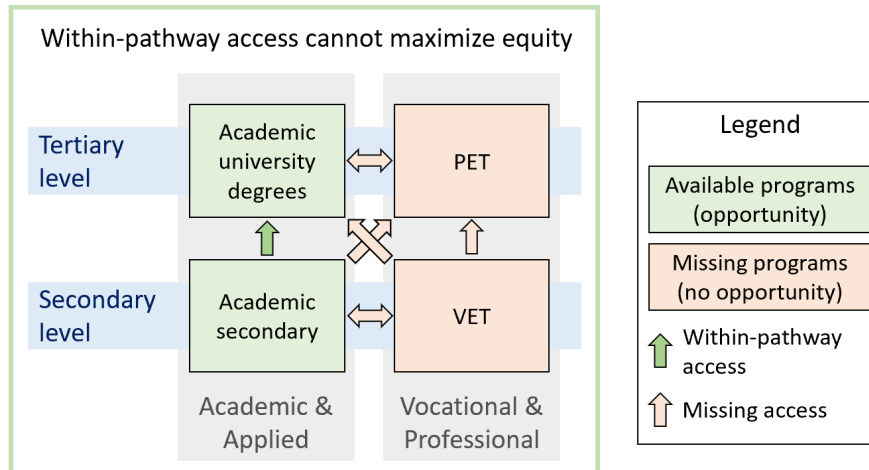
- Permeability is necessary for **equity**
 - Permeability is necessary for **successful and attractive VET**
 - Permeability supports **economic development**
-

2.1 Permeability is necessary for equity

Alongside effectiveness and efficiency, education systems are judged by their ability to deliver education and training equitably. Young people should be able to access and experience programs that deliver the knowledge and skills they need to participate in society and succeed in life. The structure and programming of education should not systematically exclude or underserve any students, especially those who belong to historically marginalized groups. When policymakers want to improve equity in education, they often focus on access. However, permeability—both access and opportunity—is required for equity and this is particularly important in VET programs. The opportunity dimension and the cross-pathway access it enables are often the missing pieces.

The link between access and equity is obvious. As a result, vertical within-pathway access is the usual starting point for improving equity. Specifically, policymakers or reform leaders usually try to increase access to and enrollment in academic tertiary programs. The “College for All” movement in the United States is probably the most high-profile example of this, but many countries around the world followed suit. Figure 3 highlights how the entire vocational and professional pathway—and all access within that pathway and between pathways—is missing even if access within the academic pathway is maximized. All of the skills in VET and PET are missing from the education system, along with programs serving those who thrive outside the classroom and access to higher education and training for those who did not succeed in academic education as adolescents.

Figure 3: Example of missing elements despite access within the academic-only pathway



The logic of focusing only on access for equity argues that statistics show huge earnings gaps between university graduates and non-graduates, so giving everyone access to university is a crucial anti-poverty strategy. However, this logic is based on an education system without opportunity like the Academic-Only, Dead-End VET, Cul-de-Sac, or Springboard types described in Module 1. In an education system without opportunity, the only possible comparison is across levels: we compare outcomes of graduates to non-graduates, or of one level to another. However, research in the economics of education has shown that *years of education*, not just university education specifically, improve key outcomes like employment and income.¹⁰

In an education system with opportunity—like the Silos, Difficult Transitions, or Full Permeability types described in Module 1—we can compare individuals at the same level of education across types. Switzerland’s system allows for these comparisons, and we find that outcomes vary by level and field—not by type. A university-educated individual is no better off than a PET-educated individual at the same level and in a similar field. **This insight completely changes the logic using education to fight poverty or foster equity: we need to prioritize access to higher education and training of all types, not merely academic higher education.**

Adding PET to the higher education and training landscape expands the scope of individuals served and the range of jobs the education system can prepare people to do. In general, university is the right approach for individuals who succeed at academic-style learning and for those who want to pursue the minority of jobs where university education is relevant. However, university education is not the best educational environment for all students, nor does it provide the necessary skills and knowledge the majority of the jobs on the labor market require. Moreover, there are few opportunities here for adults who are already in the labor market to re-enter the education system. This is much more effective with PET programs, which can also

¹⁰ See the following chapters in Backes-Gellner, U., Renold, U., & Wolter, S. C., eds. *Economics and governance of vocational and professional education and training (including apprenticeship): Theoretical and empirical results for researchers and educational policy leaders*. hep verlag.

4.3: Bertschy, K. M., Cattaneo, A., Wolter, S.C. (2020) Transition from vocational education and training into the labor market.

4.4: Backes-Gellner, U., Geel, R. (2020) Vocational versus academic tertiary education.

4.5: Tuor, S.N., Backes-Gellner, U. (2020) Why permeability counts?

recognize previous educational achievements with the right mechanisms in place (see Module 3).

Before higher education, VET is also a crucial component of equity. Young people—especially in the adolescent phase—are not all comfortable and effective in a classroom setting and are not always interested in academic or theoretical subjects. For young people not planning to attend university, academic secondary education may feel like a waste of time. In a system without VET, they may choose to or feel forced to leave education before completing upper secondary education. This can have devastating consequences for later-life opportunities. VET provides a pathway for these young people—in Switzerland, the majority of young people—to leave the classroom after compulsory education and focus on an occupation that feels immediate and relevant without sacrificing their upper secondary education.

VET's role in helping young people persist and complete secondary education highlights the final component of permeability for equity: cross-pathway access. Once opportunity is available in both academic and vocational/professional education at secondary and tertiary levels, individuals need to be able to move across pathways, not just vertically within their original pathway. The choice of an academic or vocational secondary program should not limit an individual to remain in the same siloed pathway for the remainder of their educational career.. Young people who chose VET as adolescents to escape an academic setting might find themselves ready for or in need of a university education later in life. VET that locks individuals into a single pathway cannot be equitable, especially if privilege plays a role in young people feeling prepared for or welcome in the classroom. Clear and accessible routes from any starting point to any ending point make a system with full opportunity more equitable.

2.2 Permeability is necessary for successful and attractive VET

Problems that appear to be about social stigma against certain programs can be traced back to a lack of permeability. Stigma is an outcome, not something that can be worked on directly. When a VET program fails to attract students or has a negative reputation in society, it is easy to assume that the actionable problem is program quality. Policymakers and education reform leaders often begin to work on teacher training and quality assurance measures. However, although quality is important, system permeability is the key to program attractiveness.

Young people—and their parents—try to maximize their future opportunities and minimize time and cost spent on education. Education programs will be unpopular if they close off options for higher education or force them to go back and repeat levels to advance. Even the highest quality secondary-level program will not be attractive if it does not lead to good tertiary options. This is why quality-related interventions are often unsuccessful. For a VET program to be successful, the necessary factor is progression to higher education and training programs—this requires both access and opportunity.

Access to university is not enough. For VET programs specifically, higher PET options play an especially important role in attractiveness. If a VET program's only upward option is university (Cul-de-Sac and Springboard types described in Module 1), then

the VET program is typically the longer route to the same goal. Because it slows students down and makes them take extra steps to achieve the same qualification, it becomes the second-class option. PET—which VET graduates can access more directly than academic secondary graduates—makes VET more valuable and therefore more attractive. In a system with full opportunity (Silos and Difficult Transitions types described in Module 1), young people who choose VET have their own route to the highest qualifications. In a permeable system, they can also switch to the academic pathway if they prefer or become interested in more general education. This makes VET very attractive to students.

2.3 Permeability supports economic development

Economic development relies on several factors, and permeability supports such development in at least three areas: helping individuals get labor-market-relevant skills, helping employers find the skilled workers they need to grow, and encouraging upskilling and lifelong learning. A permeable education system is also key to equitable development, which we discuss in Module 3.

A permeable education system helps both individuals and employers by reducing the mismatch between skills learned in education and those demanded on the labor market. Many countries already focus on VET for this purpose. While a Dead-End VET, Cul-de-Sac, or Springboard type system can provide more skills types than an impermeable all-academic system, only the full-opportunity types like Silos and Difficult Transitions can provide various types of skills at multiple levels. In a fully permeable system where full opportunity and access combine, individuals can acquire a wide variety of skills at levels ranging from basic to highly advanced. This lets individuals pursue the skills they need for employment, career development, social mobility, and career transitions.

The same permeability that benefits individuals also benefits firms. Employers need a wide variety of skills at various levels. In an Academic-Only system, many skills are simply unavailable at any level in from the education system. In today's world, most of the world's workers need to have soft skills (e.g. teamwork, resilience, ability to work under time pressure, ability to solve problems in unforeseen contexts) and work experience. Therefore, an Academic-Only system makes it difficult for employers to find the skills they need, hindering their growth. The problem is only exacerbated for high-level or advanced skills. While providing skilled workers for employers is not the primary goal of most education systems, the permeable system that enables people to pursue employment, better jobs, and better wages is also helpful for employers' growth.

This kind of permeability is particularly important for the “ticket out” element of the education system. In Dead-End or Academic-Only systems, individuals may feel locked in to pursuing an education path to its end in order to prove their worth on the market. This is inefficient for both the individual and the market, because instead of developing their skills on the job, they are pursuing unnecessary further training for lack of better options. A permeable system is a better differentiator of competences. It means that individuals can step out into work when they want or when they feel they will most benefit. It also means that they can step back in when they want to develop more skills. Importantly, as an economy develops and starts demanding more

advanced skills, permeable systems make the transition back into education for upskilling easier.

Faster, smoother transitions in and out of the employment system and the labor market mean less time lost and more time making a productive contribution. Permeable systems closely aligned with the labor market also mean that it does not have to be an either/or choice—an individual can pursue further education within their company. Not having to give up paid work to continue education increases equity and willingness to upskill, which brings benefits for the economy as a whole, especially when education is coordinated with the needs of the labor market.¹¹

¹¹ See the following chapters in Backes-Gellner, U., Renold, U., & Wolter, S. C., eds. *Economics and governance of vocational and professional education and training (including apprenticeship): Theoretical and empirical results for researchers and educational policy leaders*. hep verlag.

3.8: Backes-Gellner, U., Rupiotta, C., Tuor Sartore, S.N. (2020). University graduates profit from working together with VET graduates

3.9: Backes-Gellner, U., Tuor Sartore, S.N. (2020). Avoiding labor shortages by improving recruitment success through apprenticeship training

Module 3: Inclusive development

Key Points

- **Informal and non-formal learning** are important sources of skills
 - **Recognition of prior learning (RPL) increases access** by bringing informal and non-formal learning into education
 - **Formalization** of informal and non-formal learning efficiently **increases opportunity**
-

3.1 Skills development outside the formal education system

Skills required for carrying out occupations are not just learned in education and training. The mantras of “lifelong learning” and “learning something new every day” may seem almost like clichés, but behind them stands the truth that in modern labor markets, workers must keep up to date, hone and develop new skills and competences. These skills are not only learned and developed in formal education, but through non-formal courses and in informal settings like the workplace and other environments.

To differentiate different educational experiences, we define three different forms of education. The first form, **formal education**, described by UNESCO as “institutionalized, intentional, and planned through public organizations and recognized private bodies and, in their totality, makes up the formal education system of a country. Formal education programs are thus recognized as such by the relevant national educational authorities or equivalent”.¹² Formal education consists of at the primary, secondary and tertiary level. These programs lead to an officially recognized formal degree based on ISCED descriptors.

Non-formal education is the second form, and includes seminars, courses, and conferences amongst others. Such formats are structured but not regulated by any laws. The last form, **informal learning**, involves activities such as reading relevant literature or taking on new tasks at work. This form is mostly not intentional and not structured or regulated. Informal learning is widespread and can be highly relevant to employee needs because the knowledge and skills that are attained can be applied immediately.¹³ The considerable and useful knowledge and skills attained in informal and non-formal learning, makes their integration in the education system crucial.

¹² See: <http://uis.unesco.org/en/glossary-term/formal-education>, retrieved on July 15, 2022

¹³ Livingstone, D. W. (1999) .Exploring the icebergs of adult learning: Findings of the first Canadian survey of informal learning practices. *WALL Working Paper*, 10.

How to ensure the acknowledgement of skills acquisition in all education settings is a critical element of permeable education systems. This is especially important in economic contexts with high levels of labor market informality. Here we explore two elements of ensuring permeability encompasses learning outside of the formal education, ensuring access and opportunity even outside of formal education and labor structures. **Recognition of Prior Learning** allows access to the formal education system, or formal employment, by providing a framework for acknowledging previous skills acquisition that takes place outside of formal education settings. **Formalization** integrates programs outside of the formal education system by adding a clear structure and government-recognized certificate, addressing opportunity by filling in a previously empty pathway.

We draw our examples from education systems in the LELAM-TVET4Income (LELAM) project, an SNF-R4D project with the goal of better understanding how TVET can improve youth labor market outcomes in low- and middle-income contexts. Part of this project is accompanying reforms to strengthen TVET options and increase access and opportunity within systems.¹⁴

3.2 Recognition of prior learning

It is a common theme in the stories published describing Nepal’s education system: a worker with no formal training, who nevertheless has the skills to carry out the job, can only find precarious, low-paid work because they have no certification. They can’t afford to take time out of the workforce to seek qualification, or don’t see the point going back into training to learn something they can already do. How can we ensure these people have access to good working conditions or, if they want it, higher education?

Part of the answer lies in Recognition of Prior Learning (RPL). RPL provides a framework for recognizing skill acquisition outside of formal education structures, ensuring a worker or trainee can validate their previous experience and use it to find their way to new or better work or higher qualification.¹⁵ In terms of ensuring inclusive development in contexts with high levels of informality—estimates vary, but informal labor is certainly the majority status in Nepal—RPL is the access element, ensuring that through any kind of previous learning and training, someone may enter the education system and attain higher qualification or better work. Taking the simplified diagram of an education system, RPL adds to the formal element by providing a pathway into formal education for those who want it. In many ways, RPL is a necessary component of a fully permeable education system because it enables transitions in and out of formal education and training throughout an experience of lifelong learning.

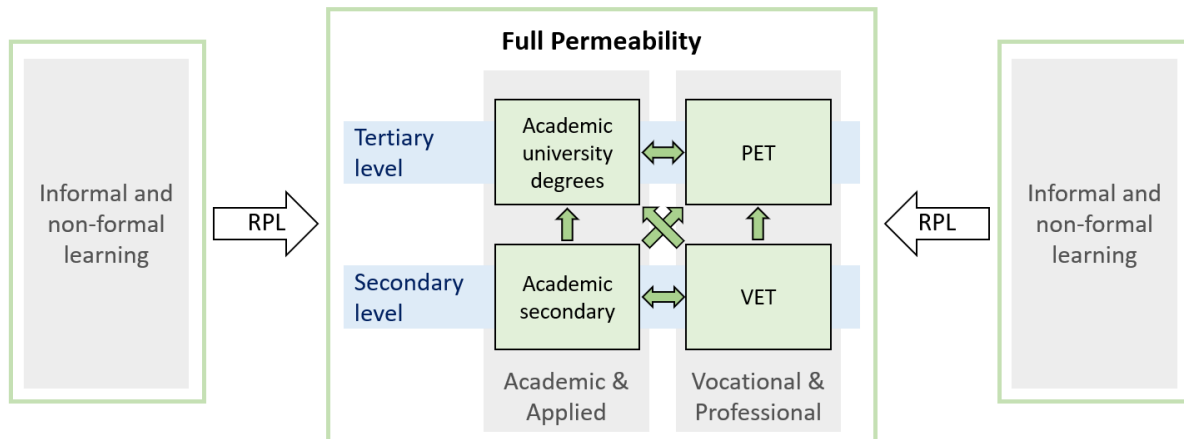
RPL is not a single process or structure. Rather, it encompasses many processes and methods for acknowledging prior experience as learning that may open further opportunities. Informally, of course, RPL happens all the time. Employers screen job candidates through their “work experience”. Employees themselves list how their previous work and other experiences have given them opportunity to hone and develop skills. Even within education programs, teachers and trainers build curricula and teaching plans based on what they assume students will already have learnt, without

¹⁴ LELAM is led by the Chair of Education Systems, ETH Zurich, with the NADEL Development Economics group. Partner countries are Benin, Chile, Costa Rica and Nepal. For more information: <https://r4d.tvet4income.ethz.ch/>

¹⁵ Hargraves, J. (2006): *Recognition of Prior Learning: At a Glance*. Adelaide: NCVET.

necessarily having certified proof. While these informal RPL procedures do not create any large problems, difficulty comes when RPL is to be used as providing a ticket to entry to a program in an education system, or a ticket to a job requiring specific qualification by law. Such cases involve some kind of codification of informally acquired skills so that people may access formal education or employment. Ensuring that acquired skills are equivalent to those taught in formal systems is critical.

Figure 4. Illustration of RPL in an otherwise fully permeable system



Nepal’s solution to this dilemma has been to offer certification for prior learning outside of the formal education system through a test.¹⁶ In theory, this provides a simple pathway to certification of skills and concrete proof that someone has the skills they say they do. But there remain hurdles to overcome. For one, setting a test for people who are not used to such assessment settings is not easy—a written exam may not, for instance, be the ideal way for someone who has only a little experience in formal education to demonstrate their skills. A solution to this problem may lie in observational tests—accredited examiners come to the workplace and examine the tasks a worker carries out in a set period. Here, access may become an issue: an employer who is happy to pay their workers under market rates may not be willing to open their workplace to an official when it could lead to workers demanding higher wages.

Even if the process can be sorted, the certification itself may not solve all problems either. Nepal’s experience has shown that although RPL certificates are, on paper, equivalent to certain NSTB certificates, in reality they are seen as a “second class” option and therefore don’t necessarily provide access to higher education or better jobs they are touted to. Nepal’s paradox of a high rate of informal work but strong emphasis on certification may not be reproduced everywhere, but it holds lessons: without

¹⁶ For more information on the role of RPL in Nepal’s education system and how it is regulated, see, for example: Murphy, A. (2018). The Wicked Problem of Including Non-formal, CPD Micro-qualifications in National Qualification Frameworks (NQFs): A Think-piece. *Level 3*, 14(1).
Caves, K. M., & Renold, U. (2019). External Evaluation: National Vocational Qualifications System Project. *KOF Studies*, 126. Zurich: KOF.
Renold, U., Caves, K. M., & McDonald, P. (2021). Constitutional Reform and its Impact on TVET Legislation in Nepal: Third report in support of developing understanding and finding the way forward for federalizing the TVET sector in Nepal. *CES Studies*, 21. Zürich: ETH Zürich.
Renold, U., Caves, K., & Bolli, T. (2021). Constitutional Reform and its Impact on TVET Governance in Nepal. *Journal of Technical and Vocational Education and Training*, 1(15), 30–46.

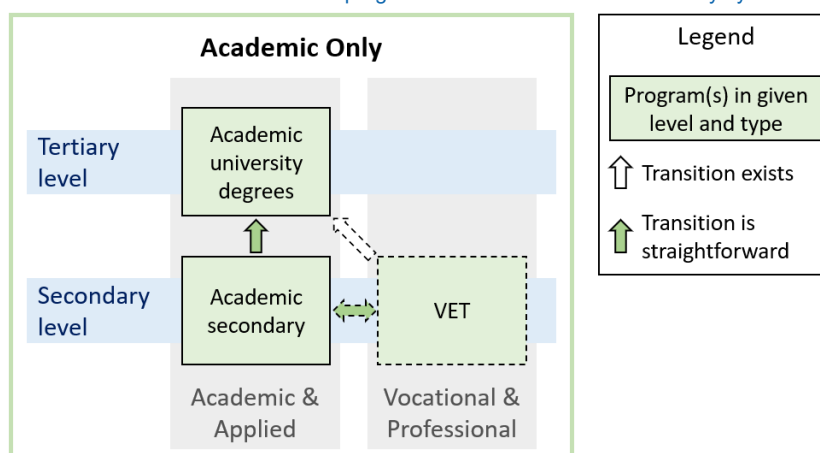
sensitizing employers and educators to the value of RPL in generally and certifying RPL specifically, it may not have the desired impact.

3.3 Formalization

In some cases, recognizing informal and non-formal learning through RPL procedures is the best way to increase permeability in an education system. Access to formal education expands opportunity to move on within the system itself. In other cases, however, it may be more desirable to bring a previously informal program into the formal system. This may especially be the case in a system where VET programs are either dead end or informal only.

As much as there is something to be said about acknowledging learning that happens outside of formal education, some of the issues discussed above concerns about second-class certification especially are likely only to be solved by ensuring formal options are also available. Formal education systems are easier for governments to manage and provide benchmarks for expected standards outside of the formal education system. Formalization of informal TVET activities also provides an opportunity for better integration of actors from the employment system into education programs. Our research shows that education systems with high levels of linkage between employers and education actors have the best labor market outcomes.

Figure 5. Illustration of formalization of an informal VET program in an otherwise Academic-only system.



Benin provides a helpful case study for how formalization can take place, and what the consequences may be. Benin has a long history of informal apprenticeships, where apprentices learn with locally respected masters. Once the master is satisfied with the quality of the apprentice’s craft, the apprenticeship is concluded with a celebration that takes on the role of “certification”. While these informal learning relationships have strong cultural and traditional stature, in most cases they do not lead to quality employment afterwards. Their recognition is necessarily restricted to the local level. The Beninese government, supported by donor partners, therefore created two initiatives to formalize informal apprenticeships.¹⁷

¹⁷ The new programs are described in detail in Nouatin, G., Bankolé, R., Gandonou, E., Kemper, J.M., and Maldonado-Mariscal, K. (2019). Country Case Study on Technical Vocational Education and Training (TVET) in Benin. *LELAM-TVET4Income Working Paper, 9*. Zürich: KOF.

3.3.1 Formalization example: Benin's CQP

The more “formal” version of formalization is the *Certificat de qualification professionnelle* (CQP), a two-year program for participants aged 14 years and older who have completed five years of primary school and have been employed for at least six months. In this program, offered in 13 of Benin's 311 recognized occupations, traditional apprenticeships are supplemented by classroom-based education in vocational schools. From the beginning of the program in 2005 until 2012, this was strictly one day a week of classroom training and five days in the firm or workshop. However, since Swisscontact's withdrawal from program coordination in 2012, training is often organized in blocks rather than by week. Teachers in classrooms are master artisans with at least 10 years' experience, or qualified teachers with a degree in TVET, though in practice these conditions are often not met and quality control only weakly enforced.

Entry to the program is conditional on passing an entrance exam set by the education ministry. Completion of the program is likewise conditional on passing a final exam, which leads to a formal certificate at ISCED Level 2 (lower secondary). While this certificate may offer access to higher-quality employment, especially in the formal sector where official certification carries more value, at present it does not offer access to higher education opportunities. This highlights the importance of taking a system-level approach to formalization. If formalization of informal activities is to succeed in increasing *opportunity* – ensuring all pathways can reach the highest level in the system – it is vital to detail the paths available beyond the newly formalized program.

3.3.2 Formalization example: Benin's CQM

A “less formal” version of the formalization, the *Certificat de qualification aux métiers* (CQM), offers no dual training, but rather access to a certificate of completion at ISCED level 2, following successful completion of an examination. There are further differences in the CQM compared the CQP that make it a more attractive option for the master artisans: there are no entry requirements in terms of school attainment, literacy or numeracy—trainees must simply be 16 years of age. In a context where many of the masters themselves are illiterate, the education and literacy requirements of the CQP are preclusive. Completion of the program requires the passage of an oral and practical exam.

CQM has a broader reach than CQP—over 10% of occupations, partly because of the reasons listed above, partly because unlike the CQP, it does not require masters to let their apprentices go for periods in training centers. However, it suffers the same problem as the CQP in that, although completion may lead to better labor market opportunities, permeability to higher levels of education is not available. The difficulty of a program that promotes inclusivity through opening access to practically any interested party is that while job-related skills may be certified, literacy and numeracy are non-negotiable for continuing to education at upper-secondary level and beyond. Previously informal learning activities may therefore need to give thought to how trainees can be supported in learning these skills as well, which clearly hold benefit beyond the labor market and finding a job.

3.3.3 Has formalization worked in Benin?

The formalization strategy in Benin is clearly a work in progress. The footprint of the programs is small: CQP cohorts number between 1000-4000 students, CQM cohorts up to 8000, in an overall cohort of close to one million students and trainees (though only 30'000 participate in TVET). Graduation rates are low in the CQP. More needs to be done to ensure there is the possibility of formal education afterwards, therefore ensuring the opportunity afforded by permeable systems is guaranteed. Moreover, both the geographic and occupational reach of the programs need expansion, to ensure they are available not only across the country but also in more occupations that youth wish to carry out.

Because the CQM is a “less formal” version of formalization (simply offering a government-recognized certificate without integrating any school-based learning), it is clearly more geared towards leading to a credential that makes a graduate more competitive on the labor market. This is a worthy goal but does not do a great deal on the ticket up side of permeability. On the other hand, CQP takes formalization deeper by adding school content that is in theory guided by government-led curricula. The opportunity aspect for a ticket to continuing on an education pathway still needs to be strengthened, as the program does not yet lead automatically to further education opportunities – partly because Benin’s education system does not offer vocational education at tertiary level (discussed further in section 4.3.3).

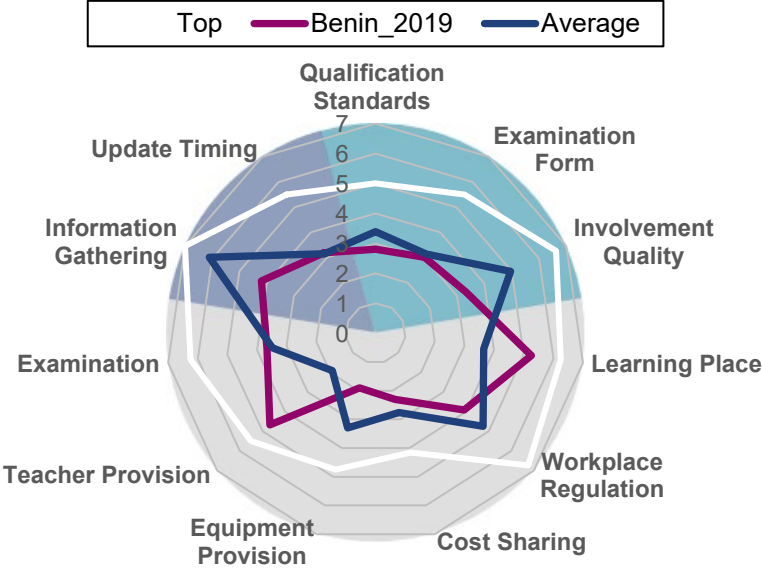
Nevertheless, the CQP is showing signs of contributing to the long-term development of the education system. The Chair of Education Systems, ETH Zurich, uses the Education Employment Linkage Index (EELI) to measure how closely actors from education and employment work together in education programs—the higher the level of linkage, the better-off participants are on completing the program in terms of employment, income, and skills being commensurate with the occupation.¹⁸ The CQP has a relatively high level of linkage compared to other programs in LELAM countries – in terms of workplace learning opportunities and teachers with industry experience, CQP is amongst the top programs in the EELI database, including those with strong dual traditions such as Switzerland, Austria and Denmark (see Figure 6). This means, at the least, room for development in the formalization of these programs, especially in terms of leading towards higher education opportunities.¹⁹

Permeable education systems need ways to recognize learning that has taken place outside of formal education settings. Recognition of prior learning (RPL) addresses access – allowing acquired skills to count towards certification or entry into the labor market. Formalization of informal learning activities addresses opportunity – filling gaps in the formal education system. However, it is not simply enough to add a certificate to informal learning activities. The experience in Benin shows that formalization offers a lot of potential, but needs to take place in a context of reform that allows newly formalized programs to offer a pathway to higher education as well as better work.

¹⁸ Bolli, Thomas, Oswald-Egg, Maria Esther, and Rageth, Ladina (2021). Meet the need – the role of vocational education and training for the youth labour market. *Kyklos* 74, 321–348.

¹⁹ Caves, K. M., Ghisletta, A., Kemper, J. M., McDonald, P., & Renold, U. (2021). Meeting in the Middle: TVET Programs' Education–Employment Linkage at Different Stages of Development. *Social Sciences*, 10(6), 220.

Figure 6. The CQP's EELI score in 2019



Module 4: Practical assessment

Most systems have some degree of permeability, at least in theory. In practice, how participants navigate the pathways available is dependent on the cohesiveness of the system as a whole and the quality of information and guidance available. As a result, permeability can be difficult to observe and discuss, even among local experts. This module describes how to assess the general permeability of an education system using the permeability types introduced in Module 1 and a simple decision tree. We also use the lessons from Module 3 to describe possible starting points and decision criteria for improving permeability.

The advantage of this framework is its ease of application due to its simplicity and practicality. The seven types describe broad permeability categories that may be encountered in practice. However, the drawback of the simplicity is that it masks diversity, conditionality, and exceptions or special cases. Users will find that there is a great deal of variation within a given type and that systems may have elements that fall into multiple types. Nonetheless, the types are a good way to make an initial “diagnosis” of the system. This can be used to target weak points and begin strategizing reforms or other interventions.

It is important to emphasize that this process is, to a certain extent, based on judgement calls made by the user. It is not always straightforward or completely clear, and key information may be conflicting or missing. We created a decision tree that can serve as a guide for matching an education system with one of the seven permeability types. The decision tree and the types are not conclusive—and users may find that their system fits between or across types—but are nevertheless useful tools for practitioners and those wanting to start conversations about permeability.

4.1 Information sources

Answering the questions in the permeability decision tree requires a certain degree of information. While every country has its own internal sources of information about the education system, we introduce some important, international sources that can assist along the way. These sources can be used as a starting point in gathering information when beginning to move through the permeability decision tree.

The ISCED²⁰ mappings are a helpful tool to consult when first starting to organize information on a country’s education system. The operational manual offers clear guidelines on how to classify programs and related qualifications, using thorough examples of existing programs throughout the world. ISCED also offers country education system maps that generally show at least what programs are available in the formal education system. Depending on the country, it may also be possible to find out which programs offer eligibility for further education. This source is very useful for starting a basic map of opportunity and access.

²⁰ <https://isced.uis.unesco.org/data-mapping/>

The CES Factbooks²¹ Education Systems offer a more in-depth overview of over 50 countries, with more added regularly. CES Factbooks emphasize the vocational and professional pathway, which can be difficult to find from other sources. The Factbooks provide information on the important stakeholders of a country's education system and major reforms, which can help identify key local experts and a timeline of system change. The factbooks can also be used to gather information about similar systems and the reforms or changes they are making.

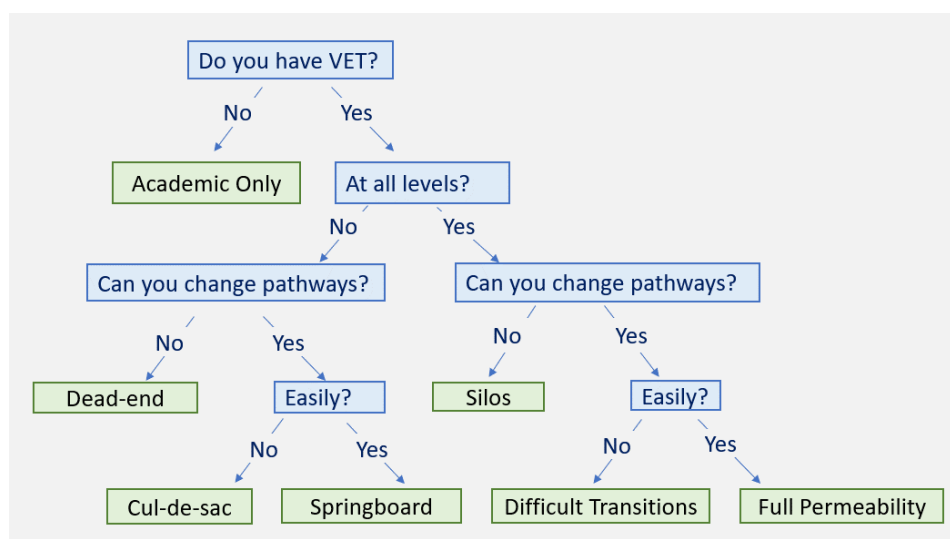
Other sources of reliable information can be national or international institutions and organizations that gather data on education systems. UNESCO's Institute for Statistics²², World Bank's Education Statistics²³ or Eurostat²⁴ are all good examples. The national statistical office is also a good place to start when looking for information.

Education systems often have programs and transitions that are not well known or used. We always recommend consulting a variety of local experts from the ministries of education and labor, employer associations, various school types, and other stakeholder groups. Coming to these experts with a draft based on the data sources above can be a fast and effective way of getting corrections and starting conversations. These should yield the most accurate information on the permeability of a system and the popularity of the existing pathways.

4.2 Identifying permeability types

The permeability typing decision tree in Figure 7: Permeability typing decision tree is a means of simplifying permeability type categorization for a specific country. Starting at the top and moving down, the questions leading to the seven types of permeability. These general types will serve as a guide towards understanding access and opportunity in an education system, discussing permeability strengths and weaknesses, and eventually planning permeability improvements. We go through each question in turn.

Figure 7: Permeability typing decision tree



²¹ <https://ces.ethz.ch/publications-and-media/factbook-education-systems.html>

²² <https://uis.unesco.org/en/home>

²³ <https://datatopics.worldbank.org/education/>

²⁴ <https://ec.europa.eu/eurostat/web/main/data/statistical-themes>

4.2.1 Do you have VET?

This question checks for any formal vocational and professional programming in the system. If there are formal programs in the system that provide VET at the secondary level, the answer should generally be “yes”. The OECD²⁵ defines VET as programs where at least 25% of the curriculum content is specific to a given occupation. Both dual and school-based VET qualify for this question. Non-formal programs—those not part of the education system—should not be included, nor should programs that include employment-related content not specific to a given occupation or for less than 25% of the total program time.

4.2.2 At all levels?

This question looks at the entire vocational and professional pathway. VET programs are usually present at ISCED levels 3-4, occasionally level 5. PET programs are offered from level 5 through 8 (tertiary level in this simplified model). PET is often also addressed as professional exams or advanced VET. Again, programs not part of the formal education system should not be included, nor should programs not specific to a certain occupation.

Some programs fall into a grey area between applied and professional pathways—nursing programs are a common example. As a rule of thumb, if there is a higher professional program but it is only available in one occupation or a small set of occupations, it is probably not important enough for system permeability to warrant inclusion. For example, Benin offers only one VET program at the tertiary level, namely a higher diploma in Agricultural Studies. This one single program is not sufficient to count as VET opportunity at the tertiary level. This mapping exercise is highly simplified, so it is a general picture of the system all students encounter and not a way of accounting for every possibility in the system.

4.2.3 Can you change pathways?

This question moves from assessing opportunity to assessing access. It deals with transitions between pathways. Answering this question does not require an investigation of the conditions and difficulty of transition. If data or local experts argue that transition is possible and that students have actually made the transition, that is sufficient.

4.2.4 Is it easy to change pathways?

Access can exist in theory but its implementation in practice might be all but impossible. In a fully permeable system, changing pathways is achievable for everyone and not a challenge possible only for the selected few. A transition—be it through additional examination, intermediate programs, documentation, or another recognition of prior learning procedure—is only functional if it is being used regularly by a reasonable number of students. The reasonable number depends on the population of students in

²⁵ OECD (2018), *OECD Handbook for Internationally Comparative Education Statistics 2018: Concepts, Standards, Definitions and Classifications*, OECD Publishing, Paris,

the origin and target programs and the incentive to transition, so an informed decision is sufficient for this exercise.

Deciding whether a transition is easy or difficult is often a judgment call. To guide the user, we suggest using time as a decisive variable. If transition to another pathway generally takes a year or less in straightforward cases and the pre-conditions and required documents are clear, then transition is easy. If the transition takes as much time as half or more of the target program, then it is difficult. Data about how many people make the transition and what the requirements are for transitioning can be very useful in answering this question, but is rare.

The permeability types and the decision tree are solely designed to facilitate the diagnosis of permeability in practice. While they are not exact tools that lead to an absolute result, their simplicity makes them a helpful asset when looking to improve a system's level of permeability. These types can be continuous companions throughout the system-changing reforms. After every change and update, a system can be newly "diagnosed" and prepared for the following reforms. This serves as a reminder that permeability is not a concluding goal, but a continuous endeavor towards an equitable system.

4.3 Permeability types of the LELAM countries

In this section, we propose permeability types for the four LELAM countries using the sources of information and decision tree mentioned in 4.1 and 4.2. This will serve as an example of how the permeability mapping can be deployed in existing systems. We aim to show some of the expected difficulties that might be encountered along the way and once again emphasize that permeability can come in many forms.

For many countries, the available information is incomplete—the information sources above rely on data being provided, and in many cases, this is either lacking or unreliable. Experts may therefore find themselves making judgement calls based on a mix of evidence, data, anecdotal information and personal experience. The judgement calls that we make here may well differ from those of a local expert or stakeholder. These simplified models, therefore, provide a good start for diagnosing the general level of permeability in an education system, which may then be used to identify areas of missing information and focus for system reforms.

4.3.1 Chile

Do you have VET?

The Chilean system offers a wide variety of vocational and professional programs.

At all levels?

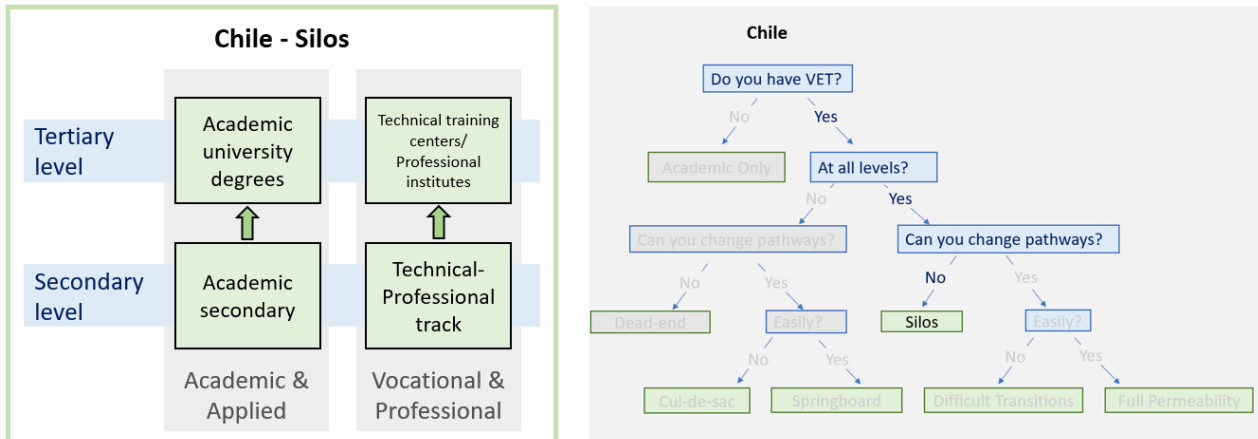
Vocational and Professional programs in Chile are offered at the secondary and the tertiary level. After two years of general education in high school, students can choose to spend the final two years focusing on a technical-professional track. At the tertiary level VET students can choose between a two-year program in a Technical Training Center, or a four-year program in a Professional Institute.

Can you change pathways?

While in theory possible, the change from the VET to the academic pathway is rather difficult and only possible at the secondary level. Due to the difference in academic

preparation, VET students score lower on the required test, making transition very rare.²⁶ Transition from academic to VET pathways may be theoretically possible but in practice is unheard of. For these reasons, we argue that the transition between pathways does not exist. This is an important distinction—permeability may exist *on paper*, but if it is neither easy nor actually used, then it is functionally non-existent.

Figure 8. Chile's permeability type



4.3.2 Nepal

Do you have VET?

In addition to the academic pathway, Nepal also offers programs VET.

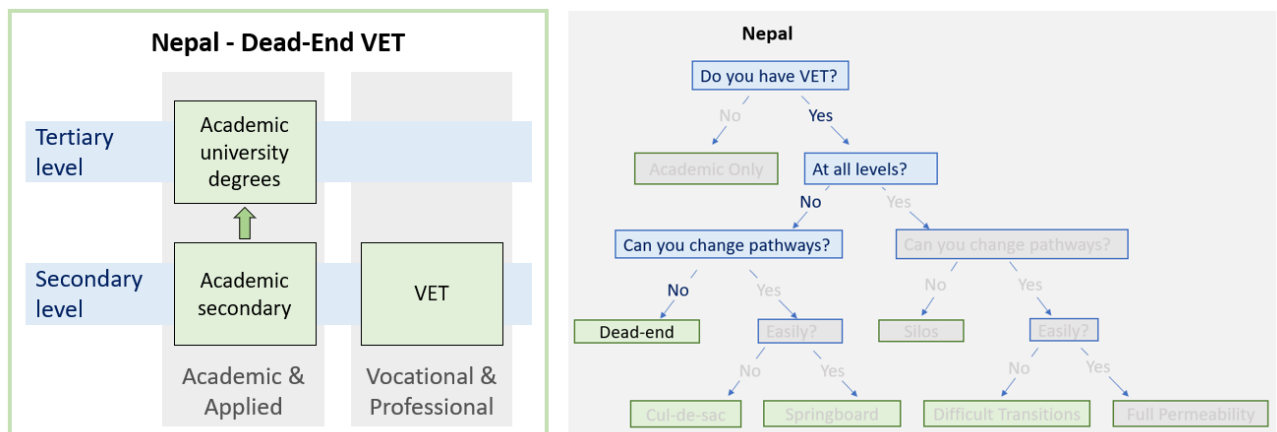
At all levels?

Vocational and Professional programs are currently only offered at the secondary level.

Can you change pathways?

Graduating from a VET program does not grant the option of continuing towards academic programs.

Figure 9. Nepal's permeability type



²⁶ KOF Swiss Economic Institute (2015). KOF Factbook Education System Chile. *KOF Factbook Education System Series*, ed. 1. Zurich: ETH Zurich

4.3.3 Benin

Do you have VET?

Besides the Academic and Applied pathway, the Benin educational landscape also involves Vocational and Professional programs.

At all levels?

The majority of the Vocational and Professional programs in Benin are offered at the secondary level. Students can obtain a Technical Baccaulaureate (Baccalauréat Technique), which lasts three years.²⁷ Another parallel program with focus on agricultural sciences takes one year longer to accomplish and secures its students a Diploma in Agricultural Sciences (Brevet d'Etudes Agricoles Techniques BEAT). Students who graduate with a BEAT can go to the tertiary level and attain a Higher Diploma in Agricultural Sciences (Diplome d'Etudes Agricoles Tropicales DEAT). This is the only TVET program in the tertiary level. Since there is only one program offered in the tertiary level it does not count as sufficient opportunity within that level—therefore we can say that VET is not offered at all levels.

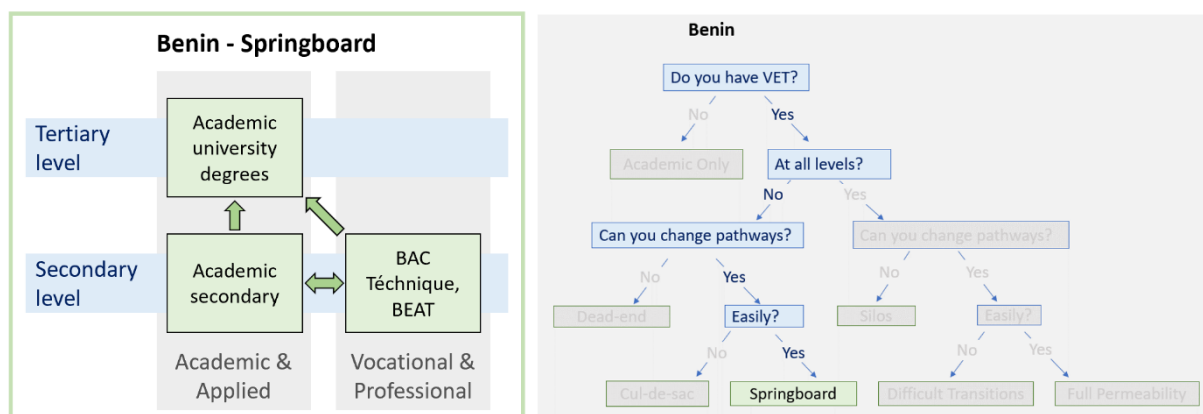
Can you change pathways?

At the end of the secondary level, students that hold a Technical Baccaulaureate can change to the general pathway to continue their studies at the tertiary level.²⁸ However, for students graduating from the general pathway change is impossible, due to the lack of VET programs in the tertiary level.

Is it easy to change pathways?

After graduating from the secondary level, VET students can either choose to change to the academic pathway or enter the job market. Since the change of pathway can happen without additional requirements the change is easy.

Figure 10. Benin's permeability type



²⁷ Nouatin, G., Bankole, R., Gandonou, E., Kemper, J. M., & Maldonado-Mariscal, K. (2019). Country Case Study on Technical Vocational Education and Training (TVET) in Benin. *LELAM Working Paper*, 9.

²⁸ CES Chair of Education Systems (forthcoming). Factbook Education Systems: Benin. CES Factbook Education Systems, ed. 2. ETH Zurich

4.3.4 Costa Rica

Do you have VET?

There are Vocational and Professional programs in Costa Rica.

At all levels?

Vocational and Professional programs in Costa Rica are offered both at the secondary and tertiary level. The technical branch at the secondary level takes three years and the VET programs at the tertiary level take two to three years.²⁹

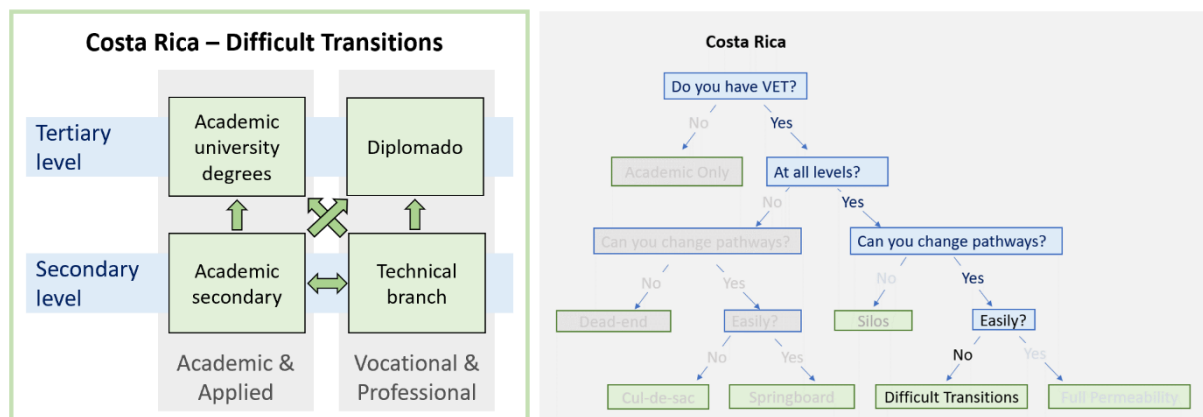
Can you change pathways?

The option of changing from one pathway to the other is possible in Costa Rica.

Is it easy to change pathways?

In the case of Costa Rica, like in many other countries, it is beneficial to look beyond the model and make a judgement call at the end. Upon graduating from the secondary level, no matter the initial educational pathway, every student can continue to any available tertiary program. However, things get a little more complicated within the tertiary level. VET programs are only offered at the Bachelor level, which creates difficulties for anyone who would like to continue further. As a result, VET students that would like to pursue further studies must change to the academic pathway. These changes are complicated and take longer than one year. Therefore we classify Costa Rica as a Difficult Transitions type.

Figure 11. Costa Rica's permeability type



4.4 Improving permeability

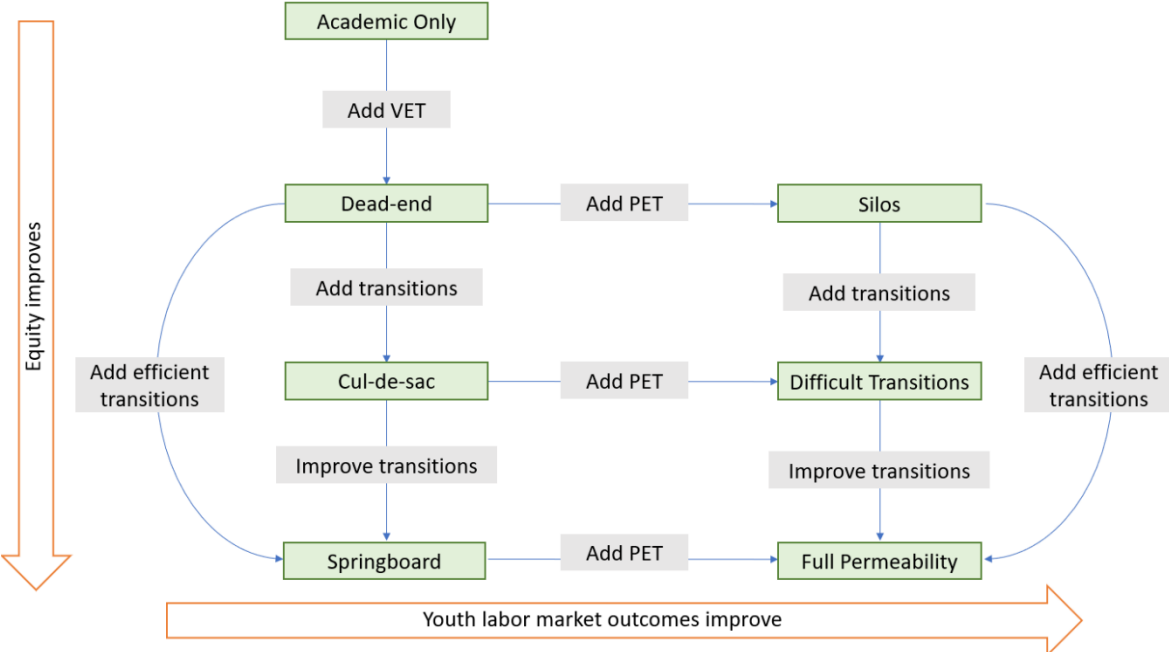
It is obvious that Full Permeability is better than Academic Only for equity, youth labor market outcomes, economic development, skills matching on the labor market, and other outcomes. However, the specific advantages and drawbacks of other types relative to each other are less clear. As briefly as possible, this section describes the choices and tradeoffs involved in prioritizing either access or opportunity to improve education system permeability.

²⁹ CES Chair of Education Systems (forthcoming). Factbook Education Systems: Costa Rica. CES Factbook Education Systems, ed. 2. ETH Zurich

If the starting point is an Academic Only system type, the only option—and an urgently necessary step—is to add opportunity. This system type is missing both the opportunity that VPET programs provide and the access routes unlocked by a multi-pathway system. Typically, the first step from an Academic Only system is to add or formalize VET, creating a foundation for the VPET pathway, but regardless of level this type requires a focus on opportunity.

For every other type, as summarized in Figure 12, improvement means a choice between increasing access or opportunity. In general, we expect that types lacking access will suffer from equity concerns while those lacking opportunity will suffer from issues with skills and youth labor market outcomes. Types that lack opportunity will also necessarily suffer from equity issues because most access pathways (the arrows in our diagrams) are impossible without opportunity. While a prescription of next steps is beyond the scope of this document, we can provide a set of considerations for identifying the right starting point, again in a highly simplified and practical manner. As a very general rule, adding opportunity is best suited to improving youth labor market outcomes and adding access is best suited to improving equity.

Figure 12: Simplified options for improving permeability from each type



If **youth labor market outcomes** are the priority—problems like skills mismatch, unemployment, bad working conditions, and poor transitions from school to work—then increasing opportunity through PET may be the better first step. As discussed in Modules 2 and 3, PET is typically well matched to labor market demand and helps young people get the skills to find jobs. Data on youth labor market outcomes is available through the Youth Labor Market Index (YLMI³⁰, for most countries) and the Youth Labor Market Index for Low-Income Countries (YLILI³¹, for low-income countries). Increasing opportunity means either establishing PET programs or formalizing existing non-formal PET programs.

³⁰ <https://ces.ethz.ch/YLMI.html>

³¹ <https://r4d.tvet4income.ethz.ch/tvet4income-news/2022/05/youth-labor-index-for-low-income-countries-now-available-as-a-webtool.html>

If **equity** is the priority and opportunity is already established at least to the level of Dead-End VET, then it might make more sense to start with access. Adding transitions—either directly by education system reform or indirectly through RPL procedures—can help add access and increase permeability. Depending on the efficiency of the transitions, it may be possible to skip from Dead-End VET to Springboard or from Silos to Full Permeability.

Permeability types are a starting point for discussion and planning, not a strategy for implementing change. After using these considerations to think about the direction of a potential reform, the two main options from the perspective of someone working in the field are supporting strategy development or partnering with other donor agencies to work directly on a pilot project. Strategic development means supporting local authorities in developing and refining a reform idea and plan through capacity building and sharing expertise. Pilot projects are generally too ambitious to manage alone, but implementing a new program, process, RPL procedure, or program formalization can be possible through partnership with other agencies or local resources.

Module 5: Sustainable development

Permeability ensures access and opportunity within education systems. Striving towards more permeability is therefore a worthy goal that will improve outcomes for youth. A diagnostic of a country's current education system helps identify areas for improvement – investing more efforts in introducing or simplifying pathways through the system, for example, or introducing new programs at higher levels to complete a part of the system. Clear and appropriate procedures for recognizing prior learning outside of the formal education system, or formalizing previously informal learning activities, also add to permeability and acknowledge the importance of lifelong learning.

As education systems move towards greater permeability, access and opportunity, policymakers and educational reform leaders need to be aware of challenges to developing a permeable system. A fully permeable system is, in turn, not the end destination of an educational reform, but rather the beginning of a continual process of monitoring and renewing.

5.1 Hurdles along the way

Challenges involved in moving towards permeability may be broken into three broadly linked categories: systemic inertia, actor opposition, and coordination. Education systems are deeply entrenched social institutions in their respective societies.³² Such embedded **social institutions** have entrenched, expected patterns of behavior, which, while contributing to stability and wide acceptance, may also make wide-ranging, meaningful reform difficult. Once an education system is set on a particular course, it is difficult to turn around.

A solution to this inertia or course-changing challenge lies in **incremental reform** and acknowledgement that moving towards a system with Full Permeability may be a multi-generational project. Indeed, moving from a Dead-End system to Full Permeability immediately is in most cases not desirable, as it may lead to confusion amongst educators as well as potential participants. A smooth, stepwise move through the possible models, testing adaptations before widespread adoption, will provide best results. This process should be mindful of end goals: improving access to the education system, or providing better opportunity for the ticket out into quality jobs, may lead to reform focus in different areas.

Relatedly, reform should be perceived as a **generational project** rather than a quick fix. No education system can be changed overnight and for reasons already mentioned

³² Rageth, L., Caves, K. M., & Renold, U. (2021). Operationalizing institutions: A theoretical framework and methodological approach for assessing the robustness of social institutions. *International Review of Sociology*, 31(3), 507–535.

above, such a change would be undesirable. Rather, incremental change stands the best chance of success. This, however, means that results will not be seen immediately, but over a course of 10-30 years, depending on the scale of the reform. In many countries, this is well over the life expectancy of most governments. Cross-party commitment to education reform is therefore a prerequisite to success.

It is also important to bring actors along and incentivize change behavior amongst established pillars of institutions. Moving towards more permeability is not a zero-sum game. But any rearrangement of a system will create **winners and losers**, and the losers especially need to be managed with care and sensitivity. Focusing on opportunities for all actors within the system may ease concerns of established institutions within the system. Increasing permeability should lead to increased participation in the system, opening further opportunity for all within it.

A system reform requires a **high level of coordination** amongst actors. This coordination is lacking in many systems, where decision-making is fragmented and unclear, and often oriented towards inputs – for instance, content or course material to be covered – rather than outputs, or expected skills and competences at the end of a program.³³ A system must, by definition, have a high level of coordination in order to be permeable. Diagnosing the level of coordination between actors and parts of the system is therefore a necessary precondition to strengthening permeability. Defining the structure of coordination is also important and will depend on the political characteristics of the system. Where responsibility for different elements of the education system is shared across ministries, clear guidance on responsibilities and shared tasks is required. In federal states, responsibilities at different levels of government and how the overall system is coordinated requires special attention. The role of non-government actors, including employers, donor partners, unions and students groups, also needs to be defined. These tasks may seem of secondary importance, but function follows structure and only structures that allow for high levels of coordination between system parts will provide functional permeability.

5.2 Ensuring sustainability

Achieving a high level of permeability is more than a goal in its own right. Ensuring high levels of permeability remain sustainable requires continuing monitoring, evaluation, and, where necessary, reform and updating. It also requires clear dialogue with employment actors and realistic goal setting to ensure that targets are achieved.

Assessing the permeability of the system in order to maintain it means having access to the information you need. Strong systems require regular **monitoring and for permeability**, this means creating and maintaining tools to measure transition points and their good functioning. Ideally this monitoring would be both qualitative – finding

³³ Governance of TVET systems is beyond the scope of this report, but it is an important element of the overall landscape for determining permeability. For more details on governance structures and their reform possibilities, with examples from Switzerland and Nepal, see:

Renold, U., Caves, K.M. (2017). Constitutional Reform and its Impact on TVET Governance in Nepal. A report in support of developing understanding and finding the way forward for federalizing the TVET sector in Nepal. A report in support of developing understanding and finding the way forward for federalizing the TVET sector in Nepal *KOF Studies*, 89, February 2017, updated version, April 2017.

Caves, K.M., Oswald-Egg, M.E., and Renold, U. (2019). Governance im Berufsbildungssystem Schweiz: Systemische Steuerung des schweizerischen Berufsbildungssystems, *KOF Studies*, 127

examples of people who have changed pathways and interviewing them on their experience to assess if it remains easy or if improvements can be made, but also quantitative – checking the flows of students within and between pathways to see if “on-paper” permeability translates to actual use of these opportunities. It is also vital to have an understanding of to what extent students and trainees themselves are aware of the opportunities a permeable system provides, whether or not they actually take advantage of them. Regular student and trainee surveys are critical in this regard.

Access to high-quality information is also important for decision-making on updates and reforms. Education systems do not exist in a vacuum and even the strongest systems need to react and respond to changes in societies and economies around them. For permeability, this might mean reacting to new expectations in VET and PET occupations by adapting entry requirements for those changing paths. On the other hand, it might also mean instigating sensitization campaigns for new occupations or educational opportunities, or monitoring informal and non-formal programs to see whether new opportunities for RPL or formalization exist. Ensuring both the access and opportunity elements of permeability are covered in any information gathering and monitoring procedure is also vital for maintaining permeability in education systems.

The most important point for maintaining permeability in education systems is to not become complacent. Permeability is not a “set and forget” state which can be left to its own devices once in place. Rather it requires attention, **active monitoring** and reform to ensure it remains relevant and that educational pathways are practically, not just theoretically, possible. Actors need to be focused on the whole system, ensuring that access and opportunity are both assured.

Permeability is the key to unlocking equity in education systems. The closer a system comes to Full Permeability, the better it is able to offer the best option to every person. Providing the ticket up into further education, or the ticket out into the workforce, is only possible when systems are clear, functioning, and there is somewhere to go.

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