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Research Report

Center on the Economics and Management of Education and Training Systems (CEMETS). Intermediary Research Report

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KOF Swiss Economic Institute

Center on the Economics and Management of
Education and Training Systems (CEMETS)
Intermediary Research Report

Katherine Caves and Ursula Renold

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Imprint

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Intermediary Research Report

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1 Introduction

There is growing demand for knowledge on the successful implementation of labor market-oriented education systems reforms and an ongoing gap in research on that topic. After the global financial crisis, youth unemployment skyrocketed and many governments have turned to vocational education reform in an effort to smooth graduates' transitions from school into the labor market (Biavaschi et al., 2012; OECD & ILO, 2014; OECD, 2010). The demand for increased vocational education and training (VET) is not accompanied by knowledge of how build new VET systems or expand old ones. The Center on the Economics and Management of Education and Training Systems (CEMETS¹) has already begun to make progress despite the complex and difficult nature of the topic.

The purpose of CEMETS' initial research project is to understand why the implementation of labor market-oriented education systems reforms succeed and fail. Findings should be generalizable to theory and to concrete situations so that we can inform both research and practice. We build and compare case studies of reform projects through the CEMETS Economic Policy Development Research Program for Education Reform Leaders. The centerpiece of that program is a ten-day summer institute during which reform teams learn about VET theory, policy, and practice and revise their reform plan. Each of the reform projects is a case study and we follow them over time as they implement their reforms.

1.1 Theoretical Propositions

The case studies are framed by two theoretical propositions from the economics of education system theory. The Curriculum Value Chain (CVC) guides data collection and the measurement of key variables. Education is a value chain from curriculum design to application, through the evaluation of outcomes to curriculum updating, until the cycle starts again (Renold et al., 2015). We use this series of phases to identify and organize the many functions that make up education processes. This enables us to model and measure our theoretical propositions.

The first theoretical proposition is that labor market-oriented education systems reform implementation is only successful when the reform addresses the whole system of policies, practices, and processes throughout the CVC. Educational processes are not linear or isolated, but rather a system of causal loops interrelated to form a system (Renold et al., 2015). Weaknesses in one area can limit the whole system. Based on this theory, an education reform has to address processes, policies, and practices throughout the CVC and not only in certain parts; simply adding the new to the old may not be sufficient to generate improved outcomes.

The second theoretical proposition is that labor market-oriented education systems reform implementation is only successful when employers are engaged throughout the CVC. As education systems move from a supply-side focus on providing learners with the tools they need for a successful life to the demand-side perspective of providing firms with skilled workers, the role of firms needs to shift accordingly so that they contribute to the system in addition to drawing benefits (Sung, Raddon, & Ashton, 2006; Sung, 2010).

In addition to our two theoretical propositions, we also collect data on rival explanations so that we can ensure rigor and validity (Yin, 2013). The two alternative ways of explaining reform success and failure are 1) high funding alone is sufficient for labor market-oriented education systems reform implementation to be successful, and 2) high enough government power is sufficient for labor market-

¹ CEMETS was created in 2015 by co-directors Prof. Dr. Ursula Renold and Prof. Dr. Marko Köthenbürger as a research body within the KOF Swiss Economic Institute at ETH Zurich.

oriented education systems reform implementation to succeed. While either of these elements is helpful and might explain reform failure by its absence, each is insufficient for success without system-level reform and employer engagement throughout the CVC.

We construct case studies of eight ongoing educational reforms to evaluate our theoretical propositions. Using the cases that attended the 2015 Summer Institute as a starting point, this research project is a multiple-case study that follows reform projects as they progress. Case studies are especially useful for theory-building research questions, and when the phenomena under study are contemporary and difficult to separate from their contexts. In addition, case studies can include all appropriate qualitative and quantitative methods, making them highly flexible. In his seminal book on the method, Yin (2013) specifically states that case studies are ideal for systems changes like the ones we investigate.

1.2 Initial Results

Generally the results of this project support our theoretical propositions: the reforms that fail to engage employers into the VET system struggle with matching labor market demand, maintaining good status for VET programs, keeping equipment and technology up to date, and funding VET. The CVC is even more relevant for reforms that attempt to build new or radically different VET systems: without framing VET as its own system between education and employment, the reform falls under the same governance as general education and fails to meet the specific goals and requirements of VET. Funding and momentum for the reform might be necessary, but they are not sufficient to start or maintain change. Government power pushing the reform seems to ensure progress but not good outcomes.

The main outcomes of this research project thus far are broader than the expected findings in the research question. We have revised and refined our theoretical frameworks and the operationalization of those theories. This is especially true for employer engagement: at the beginning of the project we had framed the importance of the private sector as a governance issue until this project demonstrated that the real question is whether or not employers are engaged throughout the processes of education. Our measurement of both employer engagement and the CVC are increasingly sophisticated as we experience their different facets in these many cases. Finally, and perhaps most unexpectedly, we found that the already-researched foundations of successful reform—like sustainable funding and communication within single stakeholder groups—are often unrealized even in major reform projects that are already underway like the ones studied here.

2 Context

The Global Education Reform Movement (GERM), is an ongoing trend in global education policy spurred in large part by international competition on comparative measures of education performance like the OECD's Programme for International Student Assessment (PISA)². Beginning in the 1980s, GERM shifted the focus of education policy from teachers to students and learning, reflecting a new constructivist approach. In the 1990s, increasing demand for guaranteed outcomes led to an emphasis on standards and accountability. In the 2000s, the focus has been on decentralized educational governance, school autonomy, and even more accountability as central governments paradoxically take greater control over schooling through incentives and requirements (Sahlberg, 2015).

Recent trends in education reform have been criticized as being too focused on measurement of literacy and numeracy, and as being too competitive. One report on the policy outcomes of PISA notes that "comparisons through international tests do not celebrate difference—they are more likely to produce

² <http://www.oecd.org/pisa/>

convergence in terms of what is seen to be valuable in educational terms” (Baird et al., 2011). Proctor, Freebody, and Brownlee (2014) take issue with the reform strategies employed by policymakers, summarizing them as “standardisation; a focus on core curriculum subjects at the expense of areas such as creative arts; risk-avoidance; corporate management models, and test-based accountability policies” (Proctor, Freebody, & Brownlee, 2014). Evers and Kneyber (2015) take an almost moralistic stance, arguing that GERM-induced policies are characterized by lack of trust, honor, purpose, and collaboration; instead they represent an “invasion” of neoliberal market-based education policies. This perspective is particularly dangerous for VET, since most calls for VET expansion are based on economic forces like unmet demand for skilled labor and the labor market struggles of youth.

Despite criticism of GERM-related reforms as too quantitative and too reliant on market-based policymaking, what little causal or cross-case research there is on the implementation of educational reforms supports exactly that type of reform. Sanders (2014) shows that school leaders are more likely to support and buy into reforms when there are clear expectations, context, support, and rewards from higher-level leadership. On a larger scale, a United States Department of Education report (Webber et al., 2014) on reforms spurred by an incentive program notes that practitioners struggle more when they cannot find adequate measures for progress in goal areas. However much quantification, accountability, and market-oriented policy choices like incentives may draw criticism, they appear to work.

Of course there are other road blocks to reform progress and other successful strategies. The education reform landscape is vast and littered with examples of nearly every type of reform both succeeding and failing. There are, however, some trends and commonalities. As one example, the US DOE Report just mentioned (Webber et al., 2014) draws from a large pool of reform projects and finds that two of the main challenges across large-scale reforms are lack of capacity, lack of expertise, and new goals or structures that do not fit into the old system. These are especially relevant for this project. Capacity-building is supported by both employer engagement and reform throughout the CVC: employers can provide resources and information that the education system struggles to access, and reforming the system instead of individual parts ensures that each phase supports the following. Similarly, the recruitment of experts is directly addressed by involving the employment system in VET. Finally, the CVC implies that VET reforms must act on the whole educational process and not only some of its parts so the issue of fitting new parts into an old system is eliminated by approaching reform in this manner.

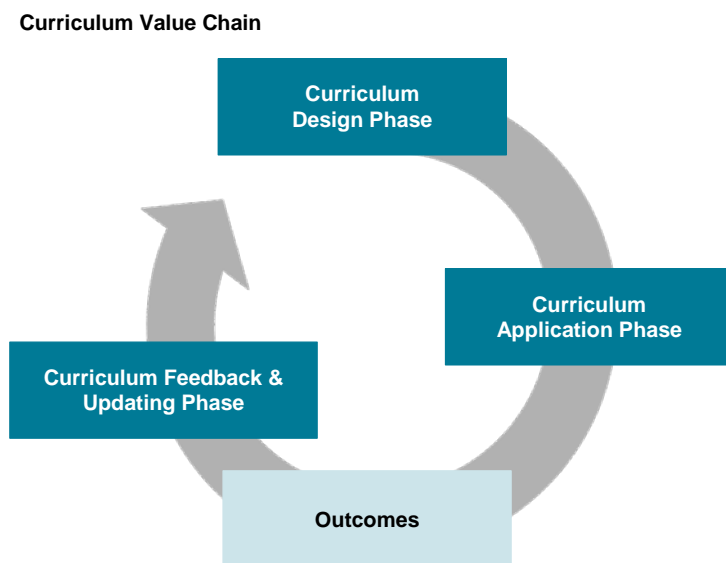
2.1 System-Level Reform

The first theoretical proposition is that labor market-oriented education systems reform implementation is only successful when the reform addresses the whole system of policies, practices, and processes throughout the CVC. Modeling educational processes as a value chain demonstrates how each phase relies on the phase before it and feeds into the following phase. If the reform only focuses on one part of the system, only two of the CVC’s three phases, or creates negative feedback and perverse incentives, its weakness in the remaining parts of the system will hinder its success.

The CVC can be considered a formalization of educational applications of systems thinking. Because educational processes and reforms are so complex, they are more accurately modeled from a systems perspective rather than a logic model (Dyehouse et al., 2009). This means that instead of viewing educational processes as a linear process, it should be seen as a series of causal loops. Each phase contributes to the next, and each affects the functioning of the system as a whole. If one phase breaks down entirely, it can break down the entire system. According to Chen (2005), systems thinking is necessary to accurately model transformational processes like the reforms evaluated here.

The CVC models educational processes into a value chain of curriculum design, curriculum application, and curriculum feedback and updating (Renold et al., 2015). Each phase entails certain specific functions that must be carried out in order for the curriculum process as a whole to be successful.

Similarly, changes cannot be made to any point in the CVC without affecting the other links in the chain, so reforms will need to ensure they either fit with the existing CVC of a system or change the entire CVC to match reform updates.



During the Curriculum Design Phase, actors plan and create the education and/or training that students will undergo. Reforms in this phase can affect who involved in designing and setting qualification standards, how those standards are measured, and by whom they are recognized. The Application Phase is the actual enactment of VET: every action where students are involved is part of this phase. This can be learning places, teacher training and provision, examinations and accountability, and quality assurance. After the Application Phase, there are outcomes of the educational processes that came

before: students will graduate and data on their labor market outcomes and employer satisfaction with their skills should be collected. This information is gathered and assessed to derive updates to the curriculum in the Feedback and Updating Phase. This phase also involves deciding when an update should be triggered. When the curriculum update process begins, the value chain begins again at the Design Phase.

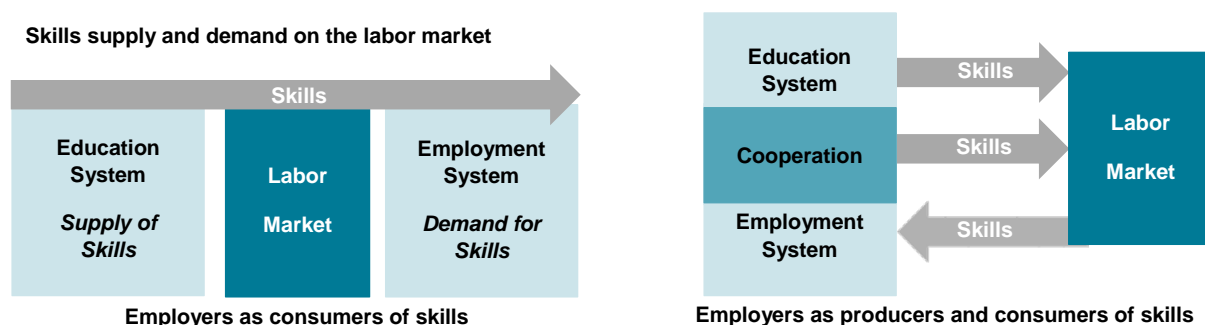
The first relevant implication of the CVC has to do with the reform project itself: the project must have the tools and resources to implement change throughout the CVC and over the course of multiple cycles in order to be effective. Implementing change throughout the CVC will require a number of reform actors from different parts of the system and with different points of view. Bringing those perspectives together requires both leadership and management—leadership to maintain the overall vision of the project and champion its ideas to outside actors, and management to create and maintain a plan for a long-term reform. The project needs to occur over multiple cycles of the CVC—possibly simultaneously—for pilot projects, second-wave releases, and upscaling. This means the team needs to have the personnel and resources to maintain continuity; high turnover in the reform team can slow down or stop the project. In sum, the CVC perspective on education systems reform implies that reform projects themselves need to have relatively large, diverse, and long-term teams with strong leadership, management, and adequate resources.

The second relevant implication of the CVC for VET reform is this: if a reform affects only one or a few of the processes, functions, or phases in the CVC, it can disrupt the rest of the chain and create misaligned incentives, internal conflict, and confusion. Therefore, addressing the entire CVC is a necessary feature of a successful VET reform. Sung (2010) echoes this sentiment by arguing that an education reform cannot merely add the new to the old: it must radically reform the system to place all elements in alignment with the shift to an “employer-led” framework. This implication of the CVC has not yet been tested, making this study the first to address it. Implications are potentially enormous for education systems reforms of all types.

2.2 Employer Engagement

The second theoretical proposition is that *labor market-oriented education systems reform implementation is only successful when employers are engaged throughout the CVC*. This implies that the employment system must link to the education system if they are to successfully provide students with VET that is useful for the student on the labor market and useful to the employer in production (Renold et al., 2015).

With the rise of knowledge and service economies, education policy is shifting focus from providing students with basic skills for success on the labor market to also include education as a way to develop skills that specifically meet the skills demands of employers on the labor market (Schwartz, Ferguson, & Symonds, 2011; Lerman, 2013). The earlier stance is an education policy emphasis on exclusively to skills supply in which education is a tool to create skilled individuals without respect to labor market demand. This is not to say that such policy does not prepare students for the labor market, simply that education policy is based around “what should be taught” rather than “what firms need.” The shift moves to a policy focus that also includes the demand for skills by employers³, so that meeting labor market demand for skills by employers is part of the skill-building purpose of education (Sung, Raddon, & Ashton, 2006). This is especially true for VET reforms: many are specifically designed to provide that employer-demand-driven element of education. If they are not so clear, they approach the same point more subtly by focusing on resolving youth labor market issues (OECD & ILO, 2014).



However, there are information asymmetries between employers and the education system that make perfect alignment of education skill supply and employer skill demand impossible without employers becoming participants throughout the education process (Acemoglu & Pischke, 1999). Employers have access to information about their own skill demand that is unavailable to actors from the education system without cooperation. Similarly, the education system has access to information that is either unavailable to employers due to information asymmetries—specifically student ability and existing skills—or too costly for the employers to attain—specifically curriculum development, teaching, and other pedagogical skills. This theoretical proposition therefore argues that employers must become a part of the system providing education if they wish to consume it so directly.

Scholars and practitioners are already aware that separation of industry from education creates problems for vocationally oriented programs and reforms. Some literature refers to the problem of “silos,” in which education is secluded in its own policy world. Making VET policy from separate silos for education and employment only compounds information asymmetries and makes VET reform even more difficult (Rose, 2012). Similarly, Sector, industry, and educational discipline silos can cause artificially thin training markets by failing to see where industries or occupations might share similar skills or training (Ferrier, Dumbrell, & Burke, 2008).

³ The demand side for VET can also include other entities, see Billett (2000)

Sung (2010) argues that employer engagement is a necessary element of sectoral VET reform. Engagement needs to go beyond sitting on skills councils and similar activities, and is likely to require fundamental changes to the who has leadership power in education and how funding is organized. The functions of employer engagement in VET, according to Sung (2010), are 1) consolidation and validation of VET qualifications, 2) keeping skills content and labor market matching up to date, and 3) making sure that VET qualifications are well regarded on the labor market and socially. They do this by resolving information asymmetries in curriculum design and participating in training to ensure skills alignment and subsequent employability.

The implication of this for reform projects is that they must engage employers in the design, application, and updating of the reform and new VET system. This means that employers participate by defining and helping decide upon the content and qualifications standards for VET programs; training, advising, and ensuring quality for apprentices; and providing feedback and information to update the system. For the reform itself, this means that communicating with employers and actively seeking employer buy-in is a necessary function of the reform project.

Due to a major gap in the literature, there is little empirical evidence that tests the theory and causally links employer engagement to the success or failure of VET systems and reforms. VET studies tend to focus on students and ignore employers, privilege the supply of skills into the labor market from education over the demand side of skills from the labor market by employers, and fail to clarify the complex relationships among actors or system features (Sung, Raddon, & Ashton, 2006). This research project directly addresses that gap in the literature by investigating employer engagement as a necessary condition for the success of labor market-oriented education systems reforms.

In the small empirical literature that exists, evidence suggests that VET reforms without employer engagement tend to struggle. For example, Sri Lanka dramatically expanded its VET program in the 1970s in response to an ILO Mission (1971, in Alailima, 1992) that criticized the alignment of skills between what was supplied into the labor market by the education system and what was demanded on the labor market by employers. However, the government-led reform failed to engage employers and unemployment among the young—now the young and educated, even VET-trained—remained (Alailima, 1992). The silo-bound VET system was far from the only reason for Sri Lanka's ongoing unemployment problems, but a dramatic expansion of VET failed to help even the students who had participated in VET. There are many examples like this, and one potential future direction for CEMETS is to deeply evaluate historical cases of VET reform to further expand our theoretical and empirical understanding of such undertakings.

This research project evaluates the employer engagement in our VET reform cases to test the theory that employer engagement is a necessary condition for successful VET reform. We are among the first to focus specifically on this issue despite its great importance for policy and theory.

2.3 Rival Explanations

Case study research can ensure rigor and validity by addressing not only its own structuring theoretical propositions but also potential rival explanations for the phenomenon under study (Yin, 2013). We address two competing propositions. First, that *high funding alone is sufficient for labor market-oriented education systems reform implementation to be successful*. This is based on the economic idea of education production in which increased inputs should yield increased outputs (Hanushek, 2006; Hanushek et al., 2011; Todd and Wolpin, 2003). While there is certainly a minimum level of funding necessary for a reform to succeed, we hypothesize that this alone will be insufficient.

Second, we address the proposition that *high enough government power is sufficient for labor market-oriented education systems reform implementation to succeed*. If a reform is ordered by a powerful

and/or central government then it can be guaranteed it will be carried out in some form. However, this does not mean that the reform will be successful (Brown & Clift, 2010; Evers & Kneyber, 2015) so we do not hypothesize that powerful top-down governance will be sufficient for reform. For these explanations of reform success, we argue that both elements—funding and government support—are helpful to reforms and possibly even necessary conditions, but are not sufficient to explain reforms' successful implementations.

3 Method

The empirical approach for this study is to build multiple case studies of diverse reform projects. The first group is a set of four reform projects in the United States. These follow replication logic, allowing us to evaluate similar reform projects in similar contexts, each of which has its own unique features that allow us to identify the most important reform features. Two international cases further extend this logic and allow us to test the theory in separate contexts. Finally, two mixed reform cases can provide additional insight. We proceed by developing a full study of each case following a case study protocol, then comparing across the cases to draw broader conclusions and develop both theory and directions for future research.

Case studies are a means of conducting in-depth explorations of current phenomena over which the researcher has little control, using any analytical method. The strategy allows us to explore success factors and barriers to labor market-oriented education systems reforms in a rigorous manner despite the limited knowledge on the subject and lack of controlled experimental conditions. Gross, Giacquinta, and Bernstein (1971) provide an early example of case studies used for a purpose very similar to this: they evaluated a single school and found that school's difficulty in implementing an organizational reform was due to its implementation processes rather than the "barriers to innovation" that were believed to be the problem by other scholars at the time. Berends and Garet (2002) discuss the integration of data from multiple sources including randomized controlled trials of educational policies and national surveys of education, and call for case studies as one strategy to develop further research questions, search for mechanisms, and understand unclear phenomena. Johnson and Onwuegbuzie (2004) explicitly describe the value of mixed methods approaches like case studies for education research.

3.1 Protocol for This Study

The case study protocol is a standardized agenda for the line of inquiry in case study research. It details how cases are selected, how information is measured, how data is collected and analyzed, and how it should be reported. This study is a multiple-case study, so the protocol enables us to maintain comparability and collection of similar data across cases. The rigor of case studies is defined by the case study protocol—a plan that outlines case selection, measures, data collection procedures, analytic techniques, and reporting—and tested with four dimensions of validity (Yin, 2013).

The four key elements of quality in case study design—and indeed in many types of research design—are construct validity, internal validity, external validity, and reliability. Construct validity is ensured by using appropriate measures for concepts under study. We base our definitions and measurements of educational reforms and outcomes on established literature and theory and use multiple sources of evidence whenever possible. Internal validity defines whether causal inference can be made from research results—this is relevant in places where we draw causal inference and allows us to identify future research directions where causal inference cannot be made. We use our theoretical framework and "rival" explanations to maximize internal validity. External validity is about whether the case study can be applied to other contexts, ensured in this case by the multiple-case strategy and international

diversity of cases. Finally reliability is about the quality of the process. We safeguard reliability by following a case study protocol and good data practices.

3.1.1 Case Selection

We used the selection process for the 2015 summer institute to identify the eight cases evaluated in this first research study. The summer institute is part of the Economic Policy Development Research Program for Educational Reform Leaders. Cases were selected for the summer institute based on applications that asked them to explain their reform project, its goals, and the progress made at the time of the application in March of 2015. The institute allowed us to select cases that already had reform plans, dedicated personnel, and sufficient resources to attend. In this way, our pool is limited to plausible reforms.

We use eight cases, which we describe in three groups based on case study sampling logic. The first group—American cases—are replication cases of similar reforms in similar contexts. The American cases are Cities A, B, and C, and City-State D. A, B, and C are major cities in the United States, and D is a collaborative project between a city and a state. As replication cases, they repeat the same phenomenon and look for commonalities and differences. The second group—international cases—are W and X, countries that both have established VET systems with qualifications frameworks that are not functioning optimally. These explore what threads hold true as we move to the broader issue of education reform globally. We also consider two mixed cases—Y and Z—where non-government education providers came to the institute to refine a specific vocationally oriented curriculum. Y is in a country with a VET system similar to W and X, while Z is in the United States. These allow us to examine yet another aspect of education reform for even deeper understanding. This logic structure follows the multiple-case design outlined by Yin (2013).

We will add to the CEMETS research project with new cases every year. As we develop and refine the case study protocol and as our cases mature, we will have more and more research findings to share with the academic world. This project is in high demand with researchers, practitioners, and policy makers, so we plan to continue both its longitudinal and sample-size expansion.

3.1.2 Measures

The specific measures used in our case studies ensure that we are measuring the same constructs across cases and that our measurement can be understood and replicated. We define what we mean by each key construct and how we will be measuring our theoretical propositions and rival explanations, as well as outcomes. We operationalize concepts into quantitative measures using rubrics and indices of functions whenever possible, and other concepts are more qualitative.

These case studies are ongoing and reforms such as these can take up to 15 years, so we need measurements flexible enough to measure each construct at multiple time points. We base our measurements on theory and literature. The key elements that we need to measure are employer engagement, reform throughout the CVC, funding, and government power. In addition, we need to measure outcomes that capture both the progression of the reform—that is whether or not it is happening—and its eventual outcomes for students and the economy.

The measure for system-level reform throughout the CVC is based on the functions that must be carried out in a successful VET system in each phase of the CVC. This list of functions is based on literature, theory, and the experiences of the authors in their work on the subject. One of the goals of this project is to refine and elaborate this list, so the current measure is a starting point. Even so, it is already a useful means of establishing where a given VET system struggles and succeeds. The list is summarized in Table 1.

Table 1: VET system and reform functions throughout the CVC**Design Phase**

Reform team is large enough to do the work
Reform team is diverse enough to represent all actors & stages
Reform team includes strong visionary leadership
Reform team includes strong project management role
Reform team continuity: team members can dedicate years to the project
Resources: the reform project has adequate resources to maintain a team
Policy agenda setting, formulation, implementation, and review are transparent
First degrees/diplomas are available to everyone free of charge
Anticipation and matching of labor market skills needs
Competence-oriented approach
Inclusion of transferrable/general skills, soft/21st-century skills
Employers/private sector involved in defining curriculum content, standards
Final curriculum formally recognized by governance body

Application Phase

Support for teacher/trainer professional development
Training centers and schools are subject to inspection and observation.
Teachers/trainers have specific training
Support and career guidance centers available to all students
Current equipment and technology available to all students
Training content and qualification standards apply to all age groups
Training content, standards are available and clear to all participants
Training providers are fully autonomous with internal quality control
Training provider outcomes are held to national qualification standards
Quality control done by an independent agency/authority
Program accreditation for upper secondary pathways is mandatory
Program accreditation for tertiary pathways is mandatory
Accreditation agencies are independent

Feedback & Updating Phase

System design reformed or updated to respond to issues and policy gaps
Support for improvement/update in qualification content
Data, research, and reports are available to decision makers and stakeholders
Feedback collected and shared on system and reform effectiveness
Students earn nationally recognized qualifications
National qualification standards guarantee transitions between levels and types
Access conditions for further pathways are clear to all participants
Youth labor market situation: data for KOF YLMI are available
Monitoring of efficiency, effectiveness, and equity
Support for social equity by constant improvement of access
Pathways are clearly linked and permeable, including traditional education

In order to measure employer engagement, we follow Renold et al. (2015)'s Education-Employment Linkage Index (EELI) and assess employer engagement as interaction between the education and employment systems whenever actors from the two systems can interact. Once its initial development and testing are complete, we plan to use the full EELI to measure employer engagement. The dimensions we use currently are summarized in Table 2.

Table 2: Dimensions of employer engagement

All three social partners are involved in VET
Reform team actively pursues buy-in from employers in designing, running, and updating the reform.
Design Phase
Employers/private sector have the final say in training content, standards
Curriculum defines standardized testing of qualification standards
Cooperation parameters are legally enforceable
Responsibilities, roles, and functions are clearly defined for all partners
All relevant branches and levels of government are actively engaged
Coordinating mechanisms ensure participation and information sharing

Application Phase
Workplace learning environment (1 = >30%, 0.5 = 11-29%, 0 = <10%)
Firms' right to train is governed by training process standards
Financing is shared among social partners (Apprenticeship wage structure)
Students earn some income during workplace training
Feedback & Updating Phase
Feedback is collected and used to update training content and standards
Results of pilot projects are communicated to employers

The measures for the rival explanations—high funding and government power in the reform—are relatively more simple than our theoretical propositions and do not require so much construction. For funding, we use whether reformers consider funding for VET sufficient and whether it is sustainable. Government power is about the level of government at which the reform originated and how it is being implemented. High government power is a top-down reform run by the central (national or state) government. Low government power is by bottom-up initialization and implementation.

Finally, we turn to constructs for the success or failure of the reform itself, both in terms of progress and outcomes. Progress of the reform is necessary because there will be no outcomes for a very long period of time. At present, this is measured by what changes between half-yearly evaluation points. We also take reformers' sense of their own progress into account. In the long run, we will be able to measure the outcomes for individual students on metrics like graduation rates, post-secondary enrollment, grades, and other priorities for our education system cases. Even further in the future, we can measure the impact of VET reform on the youth labor market using the KOF Youth Labor Market Index (Renold, Bolli, Egg, & Pusterla, 2014; Pusterla, 2015).

3.1.3 Data Collection

We collect data on each case at multiple periods in order to track the progress of the reform. Data collection began before the 2015 summer institute and is ongoing. Additional cases will be added with every annual summer institute, and we continue to follow these cases moving forward. Our main data sources to date for this research project are summarized in Table 3. All data sources for each case are kept in that case's database.

Table 3: Data sources for current cases		
Source	Contents	Date Collected
Desk research	Context and system. Basic statistics, funding, laws around VET.	March 2015 - ongoing
Summer institute applications	Pre-institute plan, problem, goals. Reform team. Context.	March-May 2015
Summer institute presentation and PBL discussion	Specific goals, plan, additional context. Key problems and strategies of discussion.	July 2015
CVC Interview	Interview on pre-institute status of functions in CVC.	July 2015
Final plan presentation	Post-institute plan, goals.	July 2015
Post-institute progress report	Changes, challenges, and successes since the summer institute.	October 2015 - ongoing
Post-institute survey	CVC functions and employer engagement measures.	March 2016

These data sources allow us to collect information for the measures described in the previous section. Data on system-level reform and employer engagement throughout the CVC comes primarily from the CVC interview, which was a structured interview on the dimensions of those constructs. We convert participants' responses into scores using the rubrics in Appendix 1 and Appendix 2. The post-institute survey will ask the same questions in a survey format that allows participants to respond directly to the rubric and will be collected in March of 2016.

We also collect data on the rival explanations. Funding is assessed primarily through desk research, the summer institute applications, and the post-institute progress reports. Government power in the reform is assessed from the same sources, as well as the presentations and PBL discussions.

Data for outcomes will change over time as our cases progress. Currently there are no students undertaking reformed programs, so their outcomes are not yet relevant nor are those for the youth labor market or local economy. The most relevant outcome at the time of this report is progress, and to assess progress we follow Connell and Kubisch's (1998) model for measuring progress using activities, not just outcomes. We record what has changed between the summer institute and each measurement—roughly every six months into the future. Data collected at each update are summarized in Table 4.

Table 4: Data to be collected at each observation point		
Time		Data (to be) Collected
t_0	Before institute	<ul style="list-style-type: none"> • CVC reform, employer engagement, rival explanations • Plan: what will change?
t_1	End of institute	<ul style="list-style-type: none"> • Revised plan: what will change?
t_2	6-9 months post-institute	<ul style="list-style-type: none"> • CVC reform, employer engagement • Progress: what has changed? • Revised plan: what will change?
$t_3 - t_n$	Every 6 months	<ul style="list-style-type: none"> • CVC reform, employer engagement • Progress: what has changed? • Revised plan: what will change?

We begin by cataloging the activities that have been started, are underway, or have been completed since the summer institute and comparing them against the schedule of activities planned for each case. We also record the challenges each case reports to understand what may be stopping them from progressing. In the future we will also include a qualitative focus on long-run outcomes.

3.1.4 Analysis techniques

At this point we can qualitatively assess the changes that teams made to their plans during the summer institute and explore the progress of some cases after the summer institute⁴. This first study is a qualitative exploration of within- and between-case patterns of change and progress. Change during the summer institute and progress after its completion. Cases have had only six months to work on their reform projects, and we know that educational reforms take time—on the order of decades rather than months—so we focus on patterns in pre-institute VET systems and qualitative changes to their plans.

We examine the pre-summer institute functions of the VET system in each case throughout the CVC, as well as employer engagement and the two rival explanations. We record specific barriers and success factors reported by the reformers to validate our theoretical framework and identify other theories, constructs, or variables that might be relevant. Within-case analysis can clarify the mechanisms underlying success and failure. In across-case analysis, we can assess commonalities and differences.

3.1.5 Reporting procedures

All of this research will be reported in peer-reviewed journals and academic conferences. The case studies are ongoing, but we will be ready to submit an analysis of the original eight cases—an extension of the one presented here—to a journal by May of 2016. The most promising journal is *Educational Researcher*, which is a top international journal in the field of education with a 2.527 impact factor⁵ and an excellent match for the topic and methodology of this research. The American Education Research Association's annual meeting is a major global conference at which the authors of this report have

⁴ We are currently in the process of collecting data on post-institute reform progress, so this is not yet true for all cases.

⁵ See <http://edr.sagepub.com/>

previously presented, and this research will be a good fit there. In addition, the Comparative and International Education Society's annual conference will also be a good opportunity to share this research and hear from our colleagues.

4 Introduction to the Cases

The cases that attended the summer institute can be categorized into three broad groups: American cases including A, B, C, and D; international cases including W and X; and mixed cases including the Y and Z programs. The American cases all operate in the same national context and have similar goals, despite different local and state contexts and current VET systems. The international cases allow us to validate our findings in completely different contexts, and the mixed cases provide insight into specific aspects of the reform process. In the following, we introduce each case's context and goals for the summer institute. This information is drawn from the cases' applications, presentations, and PBL discussions.

4.1 American Cases

City A is a large and high-poverty school district. The city struggles with long-running equity problems, especially for low-income and minority students who are much less likely to complete high school and even less likely to enroll in tertiary education. The City A group came to CEMETS to learn how the Swiss system works in order to dramatically expand their own pathways and reduce stigma against non-academic education.

In their application to the summer institute, the City A team described four goals for the development of their VET system:

1. Improve graduation rates, especially in the areas where non-completion is concentrated.
2. Improve post-secondary readiness
3. Financial sustainability: high impact for relatively low cost to the school system.
4. Build the human capital pipeline in City A's state so it is a highly skilled and educated workforce, improving the economic situation for individuals and firms in the state.

City B is a very large city made up of many separate school districts. About half of City B speaks a language other than English at home, and the poverty rate is very high. Even though on-time high school completion is relatively high, the adult population has low rates of post-secondary attainment and some employment troubles. City B has some profitable key industries that are well suited to VET, but firms in these industries struggle to find qualified workers even as young people struggle to find work.

The goal before the summer institute was to create a system that can respond quickly to skill shortages on the labor market. The current system is uncoordinated in its delivery of services, and data limitations prevent them from providing adequate system feedback and student counseling. They came for "information and insight on best practice models across the globe in developing aligned pathways driven by employer demand," hoping to learn how to identify industry-specific skill sets and incorporate those into curriculum. In addition, they needed best practices for designing and managing labor market-oriented education.

City C is also a very large city with a population of millions. Its school district also serves huge numbers of students. The district is high-poverty and extremely diverse. High school graduation rates are relatively good but fewer students are considered "college ready" and gaps persist along economic and

racial lines. Many of City C's jobs call for middle skills in a variety of occupations, and employers are desperate for skilled workers they cannot find.

City C has already begun implementing its CTE reform, and came to the summer institute in hopes of learning how to make CTE work on a system-wide level to serve the needs of all students and create an effective career pipeline into the labor market. The goals are clear, but many of the strategies and processes for achieving those goals are not.

City-State D: The state has already begun the work of building a state-level CTE system. The state has identified key economic sectors that will grow and/or already require more skilled workers than are available. It has a legal framework for CTE that encourages collaboration and certification. The city is one of its largest and is an economic center. City D's schools serve many students in both traditional and CTE programs. Roughly half of all students live in poverty, and many native languages are spoken in the district. The school system has a strong overall graduation rate, but it does struggle with achievement gaps and inequity. Graduates seem to struggle despite local prosperity, and unemployment can be very high.

City and State D came to the summer institute unaware of one other and with separate plans. The state had specific goals: learn about business leaders' expectations from and interactions with the VET system in order to develop a structured partnership between public and private interests in its CTE system. The team had to present the draft of a framework for social partnership that combined resources and knowledge into labor market-aligned career pathways only a month after the summer institute.

The city team also knew what needed to be done without clarity on how to do it. They came to the summer institute looking for behind-the-scenes insight and models for how VET systems work and strategies for bringing industry and education together into a true system. The education component needed to become more flexible on teaching strategies, curriculum updating, and program changes. The industry component needed to be formalized into a partnership rather than a consultation: they needed input on what a "career ready" student looks like in each field, recognition of industry certifications, and participation from firms in becoming learning places. Their emphasis on partnership and systematization lacked strategies to reach those goals.

4.2 International Cases

Country W already has a VET system but needs reform. Its education already includes school-based VET at the secondary level, but its perceived social value has declined dramatically. As a result, VET enrollments fell and today VET is seen as a pathway for underachievers. At the same time, Country struggles with skills mismatch and high youth unemployment.

The Country W reform team's chief concern coming into the summer institute was learning how to convert the negative social perception of VET into positive recognition of its value for students' careers, firms' stocks of human capital, and the economy. The objective was to develop a proposal for improving VET's perception. The plan was to include stigma-reduction strategies that could work top-down from the government and bottom-up from teachers. Reducing stigma and negative selection in VET was a common goal at the summer institute, and the main goal for Country W.

Country X has a VET system that benefits from well-designed stackable qualifications but struggles with employer engagement and focus in preparing students for occupations. The country has many immigrants and many native languages. In this context, VET is extremely important as a means of preparing all students for successful lifetime outcomes.

The Country X team is already experienced in VET systems and came for the purpose of increasing employer engagement. Their initial concern was that the system does not financially incentivize firms to participate in training or curriculum development, so it might be impossible to induce them to participate. They have government support for increased employer engagement in VET, but their solution will need to be structural in order to withstand political winds. They came to the summer institute looking for strategies and goals for employer engagement, as well as assistance in creating a plan of action.

4.3 Mixed Cases

Case Y is a non-government organization that provides training curricula and related services as part of an established but struggling VET system. The economy in its country is shifting, so the role of its historic apprenticeships and VET in general has changed. VET has grown in the last two decades thanks to government intervention, and now focuses on preparing students for post-secondary success including further education. The VET system has apprenticeships and stackable credentials, but seems to be too complex and has had only mixed success. Despite many individual success stories very few adults have an apprenticeship as their highest qualification. At the same time, many have no qualification at all beyond compulsory schooling and only a minority have university degrees. The labor market demands skilled workers, but they are difficult to find.

Case Y came to the summer institute to resolve outcome measurement issues in their program. Measuring students' outcomes is very difficult given the complexity of the program, which currently offers very many qualifications in a number of sectors. For the qualifications recognized by the government, each has multiple performance measures that must be reported. Further, the use of the qualifications varies by sector. Case Y needs to track students through and beyond the system despite multiple options for completion and the division of subjects into different levels of qualifications. In the end, they should be able to report how the qualification affects students' lives and contributes to higher education, further education, or employment.

Case Z is also part of a non-government organization, this time in the United States. It aims to address the failure of secondary education for many American students by focusing on career exploration and preparation, especially in STEM fields. Its focus areas are career counseling, engaged employers, intermediaries, and a favorable leadership and policy environment. Career counseling is notoriously weak in American schools, with just a few counselors typically serving hundreds if not thousands of students. The specific project for Case Z is a newer project under that umbrella, aimed at middle school students. It fills the need for early career counseling and conversations around work in the critical middle school years.

The stated objective for Case Z at the summer institute was scaling and outcome measurement. The goal was to see which steps should be taken next, identify key considerations for implementation, share experiences of implementing and scaling major reforms, and identify evaluations that can measure success and provide feedback for the further development of the program. The focus was very much on scaling and implementation, moving the program from an external idea to a native part of each participating school system's programming.

5 Before the Summer Institute

In their registration forms, each reform team summarized their goals, expectations, and original strategy. They also introduced each team member that would be attending the institute. From this information we gather the first data collection time point on employer engagement, CVC functions, the rival explanations, and reformers' goals, perceived challenges, and perceived success factors.

5.1 Quantitative Evaluation

Our quantitative data for before the summer institute focuses on our two theoretical constructs: reform functions throughout the CVC and employer engagement. We conducted structured interviews with each case during the summer institute, then scored their responses according to rubrics for both theoretical propositions (See Appendices A1 and A2 for the rubrics). We present those scores here with some discussion.

5.1.1 CVC Reform

This research is new in its field, so there is no existing list in the literature of all functions that a VET system or reform must perform. We developed such a list by reviewing the literature that does exist and drawing on VET reform experience. We use this list of key functions to evaluate the system's strengths and weaknesses throughout the CVC. Scores are summarized in Table 6 and the rubric can be found in Appendix A2.

Table 6: CVC scores before the summer institute										
Dimensions ↓	Cases→	A	B	C	D	W	X	Y	Z	Avg
Design Phase										
Reform team is large enough to do the work		4	2	1	2	2	2	1	1	1.88
Reform team is diverse enough to represent all actors & stages		4	2	1	2	1	1	1	1	1.63
Reform team includes strong visionary leadership		4	3	1	3	2	2	1	2	2.25
Reform team includes strong project management role		3	2	1	3	2	1	3	2	2.13
Reform team continuity: team members can dedicate years to the project		3	2	1	2	2	1	2	4	2.13
Resources: the reform project has adequate resources to maintain a team		2	2	2	3	1	3	2	2	2.13
Policy agenda setting, formulation, implementation, and review are transparent		4	4	4	4	4	4	4	3	4.00
First degrees/diplomas are available to everyone free of charge		3	3	4	3	2	3		4	3.00
Anticipation and matching of labor market skills needs		2	3	2	3	4	3	4	4	3.00
Competence-oriented approach		2	2	2.5	3	4	3	4	4	3.00
Inclusion of transferrable/general skills, soft/21st-century skills		3		4	3	4	3	4	4	3.50
Employers/private sector involved in defining curriculum content, standards		2	3	3	2.5	4	2	4	2	2.93
Final curriculum formally recognized by governance body		3	2	2	3	4	4	4	1	3.14
Application Phase										
Support for teacher/trainer professional development		2	2	4	4	4	3	4	4	3.29
Training centers and schools are subject to inspection and observation.		2	2	4	4	4	4	4	3	3.43
Teachers/trainers have specific training		2	3	4	3	4	4	4	3	3.43
Support and career guidance centers available to all students		2	2	4	2	3	3	3	3	2.71
Current equipment and technology available to all students		3	3	4	3	3	3	4	3	3.29
Training content and qualification standards apply to all age groups		3	4	4	4	4	4	3	1	3.71
Training content, standards are available and clear to all participants		1	3	4	2.5	4	4	4	1	3.21
Training providers are fully autonomous with internal quality control		2	2	3	2.5	4	4	4	3	3.07
Training provider outcomes are held to national qualification standards		2	3	2	3	4	4	4	2	3.14
Quality control done by an independent agency/authority		2	3	2	3.5	4	4	4	2	3.21
Program accreditation for upper secondary pathways is mandatory		2	2	1	3.5	4	4	4	1	2.93
Program accreditation for tertiary pathways is mandatory		3	3	2	3.5	4	4	4	1	3.36
Accreditation agencies are independent		3	4	3	4	4	4	4	1	3.71
Feedback & Updating Phase										
System design reformed or updated to respond to issues and policy gaps		2	2	2	3.5	3	3	2	2	2.50
Support for improvement/update in qualification content		3	2	2	4	3	4	4	3	3.14
Data, research, and reports are available to decision makers and stakeholders		2	2	4	3.5	4	4	2	4	3.07
Feedback collected and shared on system and reform effectiveness		3	3	2	3.5	4	4	2	4	3.07
Students earn nationally recognized qualifications		2	1	3	3.5	4	4	4	1	3.07
National qualification standards guarantee transitions between levels and types		2	2	3	3.5	4	4	4	1	3.21

Access conditions for further pathways are clear to all participants	2	2	3	2.5	4	4	4	1	3.07
Youth labor market situation: data for KOF YLMI are available	3	2	3	3	3	4	3	2	3.00
Monitoring of efficiency, effectiveness, and equity	3	2	4	4	3	4	3	2	3.29
Support for social equity by constant improvement of access	2	4	4	3	2	4	4	4	3.29
Pathways are clearly linked and permeable, including traditional education	2	1	3	2.5	4	3	4	1	2.79

**Scores are rated 1 (lowest) to 4 (highest) according to the rubric in Appendix 2*

*** Column-average scores are not given because we are not currently satisfied that all scores are equivalent across subdimensions.*

Across all cases and on average, there is no significant imbalance between the design, application, and feedback phases. However, there are gaps and weaknesses for each case on the functions within each phase, which means the reforms suffer from many weak links. The CVC functions are not about achieving high averages, but about getting every score above a minimum threshold. We explore the strengths and weaknesses of the reforms throughout the CVC in this section.

Design Phase: In the design phase, we address the teams' approach to their reforms and the functions involved in curriculum creation. There is great diversity among all teams in terms of team composition and how they approach the reform project. The strongest team by far is City A, which is the largest team and most diverse with excellent leadership. That team also has strong project management—although there remains some room for improvement—and good continuity in that its team members can work on the reform through existing and new infrastructure like intermediary organizations. Like all other teams, they struggle to access sufficient consistent funding and resources that can keep the team members employed for the reform project over the period of years that will be necessary for success. Many of the teams struggle with turnover and small teams without a great deal of power or diversity.

American reform teams report that their VET systems excel at transparency and at providing diplomas free of charge to all students. These are characteristics of education in the United States in general, so it is unsurprising that these largely school-based programs follow suit. However, the American cases struggle with anticipation and matching of labor market needs, recognition of VET curricula by state and national government, and designing curriculum around competencies rather than subjects. Their place within the general education system affects VET programs here: the curricula is not made to match skills demand any more than the ones for mathematics, state and national authorities are slow or unwilling to accept VET certifications into a qualification system that mostly recognizes education levels, and school subject requirements crowd out occupation-specific material. These numbers indicate that American VET reforms are at least somewhat hobbled by their roles as ancillary to general education instead of fully formed systems.

The international cases' scores also highlight the key characteristics of their countries' education systems as they are also not fully independent from general education. In Country X, the admirable design of the stackable qualifications framework is on display: every score is very high except that students bear part of the costs of their training. For X, the real problems in the design phase come from the lack of systematic employer engagement in that process. In Country W, the key strengths are transparency and recognition by the central government, because W's government is very involved in education policy and often implements it in a strong top-down manner—a manner that is very transparent due to its newsworthiness. Like X, W struggles primarily with its lack of employer engagement in the design phase.

The mixed cases reflect their own systems as well. Case Y scores very similarly to similar country X, and Z scores much like the other American cases. The key difference for Z is that the curriculum of its project is specifically competency-based rather than subject-based, as well as being oriented to the skills demands of employers. Many American education reforms attempt to include soft skills in new curricula, and Z is part of that trend.

In general, the scores in the design phase highlight the importance of VET having its own system. VET does not need to be completely separate from general education, but good VET cannot operate as a mere offshoot or alternative pathway to traditional education. Once the VET system has been set up and all educational pathways mapped out, employer engagement becomes the deciding design-phase factor for graduates' success.

Application Phase: The application phase covers all of the educational processes where students are present. This includes teaching, learning, training, career counseling, and quality control among others. The best scores in the application phase for American systems pre-summer institute are for the training curriculum applying to all age groups. Once a program has been developed, it is most often available to non-secondary students. This is often because VET programs work with community colleges and other local partners to implement the curriculum, so it is accessible to more than high schools students. The American cases struggled most with accreditation and quality control for VET programs: the programs are often not required to be accredited, and all measures of quality control are low-scoring. All of the cases worried about low social status for their VET programs, and this is exactly why.

The international cases again scored much more highly than the nascent VET systems of the American cases. The only area of real struggle for both W and X were insufficient career guidance and out-of-date equipment for training. For the rest of the application-phase measures, both cases scored well. Engaging employers with VET and increasing workplace training would solve the application-phase problems faced by our international cases: experience in the workplace and social connection to working professionals is good career guidance, and training in a productive company all but guarantees up-to-date equipment for training.

The mixed cases followed their usual pattern: Y was very similar to X, and Z was similar to the American cases. The biggest difference is that Z's program is still so early in its development that it scores very low on teacher training and clarity of content and standards to all participants.

VET programs are not just paper descriptions of the skills and competencies necessary to perform a given occupation. They must also train the students to actually do the necessary tasks and demonstrate to employers that graduates can work to a certain level of proficiency and quality. Without workplace training for real on-the-job experience, quality control, and recognition of the certifications students earn, a VET program is essentially an elective course. Again, VET needs to have its own legs to stand on, even when it stands within the broader education system.

Feedback and Updating Phase: Feedback and updating are easy to overlook in the reform process. So much focus is dedicated to the creation of a new VET program or system that its future obsolescence is never considered. At the same time, the future prospects of students both within and beyond the training occupation might be left unmapped. The American cases suffer from this shortsighted reform focus, with many of the current reforms coming about because of expired past reforms. The highest scores in the feedback and updating phase are for constant improvement of access and monitoring. Often VET programs are aimed specifically at underserved students, so access is often taken care of by the intent of the program. Similarly, American education is often characterized by its accountability and monitoring, so this trait affects VET programs as well. The lowest scores are for permeability, clarity of post-graduation pathways, qualification recognition, and system reform processes. The first three are interrelated: VET in the United States is programs, not systems or pathways. While it functions in that capacity, there will never be clear trajectories for graduates to follow. The last is another outcome of a program strategy rather than a system strategy, because there is simply no plan for updates.

The international cases do have VET systems, so they score much higher. Planning for system update and reform is still a weakness, and is definitely something both W and X should work on. Access is a concern for X, because students' paying for their education can be preclusionary. However, both

systems have national qualifications standards that stack and lead to additional academic and vocational qualifications in the future. These are the systemic aspects of VET that are necessary for it to provide graduates with good outcomes.

The mixed cases echo similar systems again. Y is part of a VET system—however complicated—so it has a national qualifications system to build on. Y also struggles with updating the VET system. Interestingly, Y's biggest challenges are in collecting and using feedback effectively because it is not sufficiently linked to the government side of the broader education system. Just as sufficient feedback cannot be gathered without employer participation, the Y case demonstrates that a VET system needs both government and employers. Z shares its struggles with permeability and linking to future pathways with the American cases, and further shares the difficulty of collecting outcome data without being a government organization with Y. In this case, the mixed cases have demonstrated how important it is for a VET system to link both education and employment, not just one or the other.

Overall, the CVC functions demonstrate that a VET reform must be a system-level reform, and VET must be its own system. The VET reforms in the American cases tend to follow the characteristics of the general education system, and while that works out in some cases it very often does not. Unless they hope to revise education in the United States as a whole, the reformers will need to find a space for VET and build something complete and new. The international cases demonstrate that such reform can happen, and the American cases can look to their national qualifications frameworks and VET pathways for inspiration. VET does not have to be separate from education, but it needs to be independent. VET has to link education governance with the employment system, and cannot be merely an offshoot of the general education system if it is to accomplish that effectively in a way that meets the demand for skills on the labor market, ensures high quality and social standing for students, and creates pathways to employment and further education for graduates.

5.1.2 Employer Engagement

For employer engagement, the original values are based on a small set of dimensions constructed before the summer institute. As we have moved through this project, the understanding of employer engagement and how it can be measured has grown—that development is reflected in later measures. For our ongoing measures of employer engagement, we use this measure as well as the new scoring system in order to have both comparability and accuracy. Cases' scores for employer engagement in VET before the summer institute are reported in Table 5.

Table 5: Employer engagement scores before the summer institute

Dimensions ↓	Cases →	A	B	C	D	W	X	Y	Z	Avg
All three social partners involved in VET		2	2	2	2.5	3	3	3	3	2.50
Reform team actively pursues buy-in from employers in designing, running, and updating the reform.		4	4	1	3	3	1	2	2	2.50
Design										
Employers/private sector have the final say in training content, standards		1	3	3	2	3	2	4	2	2.57
Curriculum defines standardized testing of qualification standards		1	3	3	3	4	3	3	1	2.86
Cooperation parameters are legally enforceable		1	1	2	2.5	3	3	4	1	2.36
Responsibilities, roles, and functions are clearly defined for all partners		2	1	2	3	4	4	4	2	2.86
All relevant branches and levels of government are actively engaged		4	3	4	3	4	4	4	2	3.71
Coordinating mechanisms ensure participation and information sharing		2	2	1	2.5	3	3	2	2	2.21
Application										
Workplace learning environment (1 = >30%, 0.5 = 11-29%, 0 = <10%)		1	2	2	2.5	2	3	2	2	2.07
Firms' right to train is governed by training process standards		1	3	1	2.5	4	4	4	1	2.79
Financing is shared among social partners (Apprenticeship wage structure)		2	2	1	2	2	1	1	1	1.57
Students earn some income during workplace training		1	3	3	3	4	4	1	1	2.71
Feedback & Updating										
Feedback is collected and used to update training content and standards		2	2	4	3	3	4	4	2	3.14
Results of pilot projects are communicated to employers		-	-	-	-	-	-	-	-	-

* Scores are rated 1 (lowest) to 4 (highest) according to the rubric in Appendix 1, Table A1

** Column-average scores are not given because we are not currently satisfied that all scores are equivalent across subdimensions.

Employer engagement in the American cases is highest for all relevant branches of government being engaged. This is included in employer engagement because the Department of Labor is considered a key player in VET and is part of the employment system. This reflects back on the lack of employer pursuit and communication—too many of the teams do not see employers as critical to their reform projects. The lowest for the American cases is that there is a legal basis for cooperation among actors from the education and employment systems. This is closely followed by other roles where employers' roles are very concrete: shared financing, and coordination among partners, workplace training, and governance of firm training. Although all of the American cases claim that employers are involved in VET in some way, that involvement is typically minimal, *ad hoc*, and ungoverned by any legal or systemic approach.

The two international cases tell a different story. W and X already have fairly mature VET systems, and while employer engagement is a weakness of both they still score much higher. Both the W and X teams report full engagement with employers in terms of governance over firms' training, clearly defined responsibilities for all parties, student income during workplace training—one way that firms can bear costs of training—and the engagement of all branches of government. The weak point in these established systems is failure to hold employers responsible for some of the costs of VET.

The two mixed cases are similarly unable to engage employers in bearing costs of VET, including students' wages and training in the workplace. Beyond that, Y has a similar pattern to the international VET systems due to the established VET system. Z follows the pattern of the American cases as it operates in the United States. None of the cases has outcome data yet on a fully completed pilot project, so there is no data in that dimension at this time.

5.2 Qualitative Evaluation

Many of the reformers shared similar goals for VET and struggled against similar problems coming into the summer institute. The common goals reformers shared for VET were also the justifications they gave for implementing it in their own areas: improved labor market and social outcomes for their students, schools, and local economies. In their labor market-based arguments for VET, many participants pointed to local skills gaps. Young people are unemployed in droves, but firms still report that they cannot find skilled workers to fill middle skilled positions. This came up in some form for every case, especially Country W where youth unemployment is almost half among college graduates, and City C where worksites are guarded lest competing employers poach skilled workers directly from their current employers. The education systems represented here fail—to differing degrees—to provide pathways for students into the workforce. The reforms all aim to at least partially remedy that problem.

The social goals reformers cited for establishing or improving their VET systems were more varied and unique to the individual problems of each context. In many cases, VET systems are hoped to increase graduation and completion rates for upper secondary education. By tailoring curriculum to career and occupational skills, students should be more motivated to complete their course of study and find training more relevant than they might otherwise do. This relies on the quality of the program and the value of credentials it offers. In addition, many teams cited reduction of inequity, achievement gaps, and similar social challenges as a key goal for reforming education towards the labor market. The City A team is an example of one hoping to use VET as part of a strategy to improve social outcomes for all its students. Again, these goals make sense with potential outcomes of VET but they depend on details and functions of VET systems that participants did not always fully understand before the summer institute.

The problems that reformers cited before the institute were often the result of an underlying issue in the governance or CVC of their education system or reform plan. The most common apparent problem was stigma: every team cited social stigma against VET as a challenge. In Country W, stigma was the main problem they brought to the institute: increased desire to attend universities has turned VET education into the perceived provenance of underachievers. A similar story plays out in other cases; concern that VET leads to an educational dead end and a second-class life combines with perceptions that only the worst students choose non-academic tracks. In the American cases, this is further added to historic issues of racism and segregation in school tracking.

Struggles with scaling VET systems came up frequently. When cases had successful pilot projects—like one specific program in City B and projects in Case Z—they struggled to transition those from individual success stories to system-wide standards. Scaling is another objective of successful VET implementation, not a barrier in itself.

Maintaining the relevance of a system and keeping it updated with the newest content is similarly difficult. Case Y came to the institute for insight on this issue and monitoring whether the system is accomplishing its goals in the first place. A reform team might create a system that perfectly prepares its students for current labor market needs, but those needs will change and students might be left behind. A good example of this is City C's horse shoeing CTE pathway—even though horse shoeing might have historical relevance, City C's current urban environment does not call for a great deal of qualified farriers. An irrelevant or out-of-date system is a problem, but it is also an outcome instead of a barrier.

Lack of partnership with firms came up in multiple pre-institute problems: most projects recognized the importance of engaging employers for curriculum design and to enable workplace learning, but did not have sustainable strategies to engage and maintain firms. City B's team came from an industry-oriented organization and worked extensively in this area, but without understanding the business case for training they struggled to integrate firms into their VET governance.

All of the most commonly cited problems turn out to be outcomes of other sets of success factors and barriers to education systems reforms. When reformers have vague targets, do not understand their educational and economic ecosystems, work in fragmented groups without leadership or vision, and think in terms of putting out fires instead of building systems, their success is blocked. Success factors for reform implementation are strong leadership, a team approach, a clear and realistic vision, thinking in terms of operationalization, communication, and information gathering. As reformers moved through the summer institute, they began to understand these success factors and reorient their discussions around systemic solutions rather than problematic outcomes.

6 Results: Change during the Summer Institute

This section recounts the qualitative changes that happened over the course of the summer institute. At the end of the summer institute, every reform plan had evolved into a more thoughtful, evidence-based project with plans that included how governance should be structured and what should happen along the CVC. As mentioned in the discussions, most of the plans were to create pilot projects with a smaller set of occupations and a clear focus. Participants' final plans included roles for intermediaries as well as employers. After seeing what Swiss apprentices can accomplish, reformers were willing to ask more of their secondary-level students instead of waiting for graduation to implement workplace training. This is not fully true in all cases, but the presence of students in workplaces increased in all plans after the institute.

Participants recognized the value of small pilots, intermediaries, and employer engagement early on, and those featured heavily in discussions of what other reformers could do next. All of these features perform functions that are key for successful VET systems. More importantly, they also reduce risk of barriers to VET reform implementation while supporting success factors. They are more than helpful tools for system design, and represent means of heading off problems while creating effective governance and CVC systems.

Employers were often a sideline or advisory body in the initial plans of most teams. By the end of the institute, teams moved from employer participation to social partnership. Employers benefit significantly from improved VET, and their demands for skilled workers drive many of our reform projects. It is only logical that they should share in some of the costs—especially since their role in training is not philanthropic. Employers who train can do so at a net benefit to their bottom line, and this dramatically changed every team's strategy for engaging employers. So long as their system of apprenticeship supports firms' ability to at least break even on training, they can expect much more from their private sector. At the end of the institute, VET was understood as a partnership instead of a new project for school districts.

The most interesting trend in plan changes from before to after the institute was the tendency towards radical change. Initially, teams planned to make small changes and adjustments to their existing systems. These changes often seemed like major changes—increasing the number of students in CTE, getting firms involved as advisors, or creating workplace learning opportunities like job shadowing—but stopped short of radically changing what students would be doing every day and who would be responsible for their learning. At the end of the institute, teams were prepared to recommend major changes—raising employers to equal partners in VET, implementing dual apprenticeship, and changing the governing responsibility of the entire VET system. Once the possibilities and processes of strong national VET were clear, radical change became not only possible but correct.

The driver for these major changes in VET understanding and reform planning was the integration of theoretical and functional mechanisms underlying VET into the summer institute curriculum. Showing participants around important sites for Swiss VET has value and they would certainly learn from that experience, but the opportunity to learn about all of its multiple outcomes, inputs, structures, and processes from our leading scholars sets the CEMETS summer institute apart from any other effort to communicate key VET strategies. Working on their own case and the reform projects of their peers gives them practice at thinking like reformers and lets them see how others—especially others in different reform phases—strategize and manage their reforms. Coming at VET reform from a theoretical perspective under the governance and CVC framework enables our participants to systematically evaluate their existing system and their reform plans. With the knowledge of how VET really works, participants can look for reform strategies that minimize implementation barriers while maximizing success factors.

7 Results: Post-Institute Progress

7.1 American Cases

City A: The City A team has been very busy since the summer institute. Their broad-based team has taken on the multiple fronts for reform that exist throughout the VET system they are building. In addition,

they have prioritized employer engagement throughout the reform process and continue to do that. They are currently most focused on the curriculum design phase as they attempt to implement apprenticeship-oriented VET programs in the fields of IT, advanced manufacturing, and finance. The major initiatives have centered on building buy-in from employers in their key industries, leveraging employer associations as intermediaries, and convening employers to identify their key curriculum needs. City A's is a bottom-up reform, so they are just now bringing in state-level governance officials and beginning the process of changing laws that might form barriers to their reformed system.

Key success factors for City A at the moment are the multiple stakeholders involved in the project and employer leadership of the reform. The most worrisome barrier is the push for speed in the reform, which risks the reform team unintentionally missing crucial functions in the CVC during their reform. At the moment the application and feedback/updating phases are not being addressed, which could hamper their progress when they move towards those phases for this reform cycle. They have been able to secure additional grant funding, but long-term funding is still a question.

City B: Since the summer institute, the City B team has established a governance structure through a new collaborative organization. The new organization has support from government and is charged with evaluation of outcomes for program development and long-term planning. The problem of financial stability is eased through new and extended grants. The reform will need to resolve some ambiguities—unclear either because they are not explicitly stated or because they may have been overlooked—and ensuring that VET has a home in the education system as well as the employment system. Unusually, this project will need to fight for its education reforms to exist within education.

The most salient success factors for this reform are its strong base in industry, the capacity already built over the first phases of the reform, and its current momentum. At this point, though, the project is insufficiently connected to educational processes and risks being a side program to the education system rather than an integrated part of that system. When the City B team resolves unclear processes and finds an anchor in the education sector as strong as its involvement in the private sector, this reform should be able to rely on its strong foundation of capacity and its momentum to grow and succeed.

City B's VET reform is starting strong: it has an industry-oriented approach, intermediary organizations, and some existing infrastructure already. By resolving some ambiguities about unspoken or not-yet-considered aspects of the reform, and by ensuring integration within the education system as well as the employment system, the City B reform can be even stronger.

City C: The City C reform team has not yet submitted their post-institute report. We were already concerned that the small team—one person—from City C would be insufficient to start a full-scale education systems reform. That person has moved to another position and been replaced, so the reform project is technically ongoing but under new leadership and without progress. This is an interesting case because it is one where the desired outcomes do not appear to be materializing. We will continue to monitor this case.

City-State D: The teams from the city and state in D have also failed to submit reports at this point. The representative from the state has moved to a different job and been replaced. The representatives from the city are still at work on the project but we do not yet know how far they have progressed. We know that the City D part of the team has been active in discussions about VET, but we cannot concretely say what they have accomplished. With further data collection we will know more about this case.

7.2 International Cases

Country W: The Country W team came to the summer institute to solve the problem of stigma around VET. At the end of the institute, they left with a different definition of the problem: need for specific

changes to the VET system to ensure high-quality VET that will be in high demand by students and on the labor market. The key elements are dual VET with apprenticeships, permeability in the VET system, competency-based curriculum, and employer engagement.

Since the summer institute, there have been progress and changes in Country W's VET reform. The biggest element of the current reform is that dual apprenticeship training—learning at school and in the workplace—is being implemented throughout upper-secondary VET. The government's decision to make apprenticeship training a part of all training by 2017 is revolutionary in this context. Students will attend school approximately two-thirds of their time, with the remaining third split between multi-school training centers and company work placements. The first group of pilot schools already began implementing the plan in 2015, and more will be selected from applicants to begin in 2016. All other schools will add apprenticeship in 2017. This project draws on all previous VET reforms and relies on their success for its development. At the same time, it will bring any remaining weaknesses to light as it increases the load on the system. Country W should be ready to identify those weaknesses and build capacity where needed.

The most salient success factors for this reform can be broadly described as W's existing VET infrastructure and the strong commitment of the government to reforming VET. The key barriers to progress are lack of capacity-building, disarray in the reform efforts of different practitioners and policy makers, missing research results to support policy and practice, and lack of communication and information exchange with employers. The first set of challenges are about failure to reform the entire system throughout the CVC, and the last one is a problem of not engaging employers. Activities described as "capacity-building" are reforms that bring the rest of the system up to date with a newly-reformed element—this is a key reason that reforms should act on the entire CVC.

Country X: The team from Country X reports informally that there have been many changes to the broader national context of VET—a situation that is often in flux as government administrations change. They have not yet submitted their report but we are aware that there has been great interest in their knowledge gained from the summer institute. We look forward to hearing about their progress.

7.3 Mixed Cases

Case Y: The Case Y project focused on adapting to new legislation and designing measurement systems for tracking students during and after completion of one program. This is relevant to the feedback and updating phase of the CVC for both system-level reform and employer engagement. Case Y has struggled to compel data from employers and students because of its role as a non-government provider. This underscores the importance of engagement throughout the system—it must be an overlap between education and employers, not only one side or an individual organization in the middle. Case Y has designed a measurement strategy that balances its needs with the demands of the government, and we will see in the future whether this meets the needs of both parties.

Case Z: The program Z brought to the institute was also focused on developing a measurement system that could report its outcomes to potential client school systems. They have also developed a system of measurements, and their challenge further demonstrates the importance of interconnected education and employment systems. Z also stands outside both systems and occasionally struggles to find both schools where it can implement its programs and employers willing to participate. Z has only submitted a preliminary report, so we do not yet know whether they have been successful at engaging both employers and education.

8 Discussion & Conclusions

At this stage it is hard to draw conclusions about the post-institute progress of our reform cases, especially not as clearly as we can for the changes that happened during the institute. We are still waiting on the post-institute reforms of about half of our cases and we have not yet surveyed changes in our theoretical constructs. What we can see is that the theoretical propositions of system-level reform and employer engagement certainly play a role in our reforms, and also that there are other simpler issues at play like personnel and communication.

System-level reform seems to be important for reforms' progress at this point. The reforms that focus only on one part of the system or act from the silo of only education or only employment are more likely to stall than those that are not. City C's reform project comes completely from the education system without any employer engagement, and is currently making no progress. Similarly, the D state project is very far over to the education side and is stalled, while the D city part of that reform seems to be moving forward and is more rooted in employment. City B comes from the employment side, and it has already succeeded at setting up new governance systems and offices. City A has made perhaps the most progress of the American cases, and it operates in a fully integrated education-employment manner.

Internationally, the Country W reform is very much on the governance side but with the intention of bringing employers into education through its own style of apprenticeship. It is progressing on the strength of government orders alone, but it is not yet clear how successful it will be at integrating employers or generating good outcomes for students. The Case Y and Case Z cases highlight the importance of linkage: both reforms struggle to maximize their productivity due to being so separate from both education and employment.

It is more difficult to determine what is happening with system-level reform throughout the CVC, because at this point most of our reforms are hypothetical. The problems of failing to build capacity throughout the system will likely become much clearer once schools are actually attempting to implement the programs designed by these projects. One piece of evidence for system-level reform is the Country W case. The top-down nature of the reform means that it is moving forward despite issues with gaps in the CVC. The creation of materials and curricula is falling to teachers at individual schools, relationships with industry are unformed, and despite feedback being collected it is not being shared. If the system is not reformed as a whole—instead of simply adding apprenticeship into the VHS list of responsibilities—it may fail to perform.

Funding is clearly a necessary component for reform, but it does not appear to be sufficient for reforms to progress. Many of our teams have spent a great deal of energy securing extensions to grants or new donations. They cannot go on without being able to pay the team responsible for carrying out the reform. However, City-State D and City C both have sufficient US Federal Government funding for their reforms but still cannot move forward.

Government power in the reform process appears to be sufficient for progress but not for successful outcomes. The Country W reform is moving forward because of its government mandate, but it is currently creating trouble for lower-level education practitioners and there is no guarantee of quality at this point. Case Y's project is a similar example, as the government ordered Y to revise its data collection processes without participating in the reform process. Neither the government nor Y is likely to get everything they want out of the reform.

In addition to our theoretical constructs and rival explanations, we observe a third class of even more basic success factors and barriers to education systems reform implementation. These are the absolute

basics of any venture: resources, communication, leadership, and personnel. None of the cases have a guarantee that they will have adequate resources to pursue their reforms over the years that will be necessary. The D city and state reform teams did not know about one another until they arrived at the summer institute. Similarly, City C identified potential employer partners while in Switzerland but had failed to do so while in the United States. These communication failures indicate that the reform teams may not have been working with willing and available collaborators and resources, making system-level reform and employer engagement impossible. The kind of leadership that can keep a project going in difficult times is missing in most cases. Similarly foundational are dedicated personnel: there has been turnover in the City B, City C, and City-State D reform teams. This stalls reform projects—especially in teams of one like C and D—and also prevents teams from even addressing systems-level reform and employer engagement.

9 Next Steps

CEMETS will continue its work with these eight cases and will add new cases annually through the summer institute. There is already interest from a variety of countries for the 2016 summer institute, and we have formed research relationships with most of the cases from the 2015 summer institute.

We are already working with certain cases to create within-case quasi-experimental trials that will allow us to measure the impact of their programs and test specific aspects of the theory. These are happening primarily in Country W and City A at the moment, though there is also interest in Country X and other cases—we will discuss these after going through the primary modes of analysis for all cases. In the future we will have more time points for these cases and more cases from future summer institutes. Additional time points will allow us to find more nuanced patterns and clearer outcome and progress trajectories. Additional cases will enable us to test our findings in other contexts, reform types, and simply on more cases.

Further within-case analyses will allow us to explore mechanisms and test specific elements of our theoretical propositions. For example, we are currently discussing options for within-case research projects in City A and Country W, with additional options in Country X. These would be more traditional econometric policy analyses using regression analysis techniques. For City A, it is evaluations of individual programs and pilots as they begin. For Country W, the within-case research would be either an in-depth study of one vocational high school as it transitions to the new apprenticeship model, or a causal evaluation of that program's effects following the staggered implementation of the model in vocational high schools throughout the country. For Country X, it would explore labor market entry for graduates of different VET programs available in the state.

This iteration of the CEMETS research project will generate further publications. As we move forward, the cases where our relationship with the reformers is strongest will turn into their own dedicated papers. We plan to publish additional papers on City A, and will likely do the same for Country W, Country X, and others as our research relationship continues. Finally, the econometric within-case studies can also be published as individual papers.

Annex

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Appendix 1: Employer Engagement Rubric

Table A1: Employer Engagement Rubric				
	1 (no)	2	3	4 (yes)
Employer Engagement				
All three social partners involved in VET	One partner involved	Two partners involved or all partners very loosely involved	All partners formally involved but only at certain moments	All partners formally involved throughout VET policy cycle
Reform team actively pursues buy-in from employers to design, run, and update reform.	No employers pursued	Employer buy-in pursued for informal input and application phase training	Employer buy-in pursued for formal input and application phase training	Employer buy-in is sought and used throughout reform process
Employers/private sector involved in defining curriculum content, standards	Curriculum development is entirely school-based	Employers consulted on curriculum development on an ad-hoc basis	Employers officially involved in curriculum development	Employers lead curriculum development
Employers/private sector have the final say in training content, standards	Curriculum finalization is entirely school-based	Employers consulted on curriculum finalization on an ad-hoc basis	Employers officially involved in curriculum but without final say	Employers must at least check off the final curriculum
Cooperation parameters are legally enforceable	No VET law or agreement exists mandating cooperation	No VET law exists but there are legally enforceable agreements in place	A VET law exists and mandates cooperation but is inadequate	A VET law exists, mandates cooperation, and is enforced
Responsibilities, roles, and functions are clearly defined for all partners	Not all partners (schools, firms, government) involved	All partners informally or barely involved	All partners officially involved but without defined responsibilities	All partners involved with clearly defined responsibilities
Alternative:	Not all partners (schools, firms, government) involved	Partners involved	Partners engaged	Partners share leadership
All relevant branches and levels of government are actively engaged	Only one level and branch of government is engaged in VET	Multiple levels (branches) of government are involved but only in one branch (level)	Multiple levels and branches of government are involved, but not all	All relevant branches and levels of government are involved in VET
Coordinating mechanisms ensure participation and information sharing	No coordination exists	Informal coordination promotes participation and information sharing	Formal coordination for limited participation and/or information sharing	Formal coordination for participation and information sharing
Workplace learning environment (1 = >30%, 0.5 = 11-29%, 0 = <10%)	No workplace learning (job shadow doesn't count)	less than 10% workplace learning on average	11-29% workplace learning on average	30% or more workplace learning on average
Firms' right to train is governed by training process standards	No firms train	Firms train but any willing firm can train apprentices	Firms train under informal standards	Firms train under standards governing the right to train
Financing is shared among social partners (Apprenticeship wage structure)	A single party pays for all training costs	Schools/government bear most costs with unsustainable/unsystematic private donations	Financing is shared among social partners but the private share is less than 30%	Financing is shared among social partners
Students earn some income during workplace training	Students pay for workplace training OR no workplace training exists	Students work for free	Students work for credit OR some are paid while some are not	All students are paid during workplace training
Feedback is collected and used to update training content and standards	VET feedback is not collected	VET feedback is collected but not used for updating OR is not often collected but is used	VET feedback is collected and used but no system exists for updating	VET feedback is collected and used for updating
Results of pilot projects are communicated to employers	No communication of results	Pilot projects only evaluated in terms of educational outcomes	Pilot project results are posted but not actively distributed	Pilot project results are shared and used to bring in new employers

Appendix 2: CVC Rubric

Table A2: CVC Rubric				
	1 (no)	2	3	4 (yes)
Design Phase				
Reform team is large enough to do the work	Reform team of one	Reform team of 2-3	Reform team of 4-6	Reform team of 7+
Reform team is diverse enough to represent all actors & stages	Only one actor (education)	Both education and employment, but only one or two people from each	Education, employment, and intermediaries, but only one or two people from each	Education, employment, and intermediaries all represented
Reform team includes strong visionary leadership	No leadership (team of one) OR no power to change	Project leadership is shared/unclear/contested, OR present but limited power to change	There is a leader but without sufficient power/vision	A clear leader exists who can maintain the reform vision and champion the project
Reform team includes strong project management role	No project management	Planning is not associated with management	Project management exists but is shared across reform team members	Clear project manager role exists and is filled
Reform team continuity: team members can dedicate years to the project	Reform team has high turnover, no full-time team members OR team members are not the ones reforming	Reform team has high turnover but some full-time team members OR all members working alongside work	Reform team has some full-time team members, must work on reform alongside daily work.	Key reform team members can work on the reform full time for years
Resources: the reform project has adequate resources to maintain a team	No resources are dedicated to the project specifically	Resources are available through grants and donations, not from the education/employment systems	Reform project has adequate short-term resources but no sustainability	Reform project has adequate dedicated resources for the long term
Policy agenda setting, formulation, implementation, and review are transparent	Not at all	Some reports released post-hoc, but incomplete	Information is available but prohibitively difficult to find	Information is available
First degrees/diplomas are available to everyone free of charge	Students bear the full cost of training	Students bear potentially preclusionary costs of training	Students bear some costs of training, but not enough to preclude anyone	All training costs are borne by the social partners
Anticipation and matching of labor market skills needs	Based only on student demand or program availability, not labor market	Based on labor market needs with slow updating OR only some occupations are based on LM	All developing OR all based on current labor market needs without anticipation of changes	Based on anticipation and matching of labor market needs
Competence-oriented approach	Curriculum based on subjects	VET based on competencies but overall dominated by required subjects	VET based on competencies with some required subjects OR competency-based but irrelevant	Curriculum entirely based on competencies required for VET
Inclusion of transferrable/general skills, soft/21st-century skills	Curriculum entirely specific and hard skills	Curriculum has general skills but focuses on hard skills	Curriculum has general and soft skills but not explicitly	Curriculum explicitly includes general and soft skills
Curriculum defines standardized testing of qualification standards	Qualification standards do not exist	Qualification standards are not tested	Qualification standards are tested in-school OR are only available for certain occupations	Qualification standards are tested in a standardized manner
Final curriculum formally recognized by governance body	Curriculum not recognized by government	Curriculum recognized only by local government/school	Curriculum recognized by state government	Curriculum recognized by national government
Application Phase				
Support for teacher/trainer professional development	Not at all	Some available but not mandatory/teachers bear costs	Yes, paid OR mandatory, or both but infrequent	Yes regularly, paid, and mandatory
Training centers and schools are subject to inspection and observation.	Schools and training centers are never inspected	Schools and training centers are inspected only when problems arise	Schools and training centers are inspected regularly but very infrequently; or irregularly	Schools and training centers are regularly inspected
Teachers/trainers have specific training	VET teachers/trainers have no specific training	VET teachers/trainers have industry or teaching experience, no training	VET teachers/trainers have training without qualification	VET teachers/trainers are qualified

Support and career guidance centers available to all students	No career guidance is available	Career guidance exists but is poor quality or inadequate	All students have access to adequate career guidance in high school	All students have access to quality career guidance in middle and high school
Current equipment and technology available to all students	No equipment available	Equipment and technology are very out of date	Equipment/technology up to date but undersupplied OR imperfect but available	Current equipment/technology available and up to date
Training content and qualification standards apply to all age groups	No qualification standards	Qualification standards apply only to upper secondary students	Modified qualifications can be earned by any age group	All age groups can earn the same qualifications under the same standards
Training content, standards are available and clear to all participants	No qualification standards	Qualification standards and content are confusing and inaccessible	Qualification standards and content are available OR clear	Qualification standards are available AND clear
Training providers are fully autonomous with internal quality control	No training (only theory)	In-school training only	Training providers are independent but have no quality control	Training providers are independent and autonomous with internal quality control
Training provider outcomes are held to national qualification standards	No training (only theory)	Training exists, but no qualification standards	Training is held to local or state standards, or only some programs are held to national standards	Training is held to national standards
Quality control done by an independent agency/authority	No training (only theory)	Training exists, but no quality control	Training providers control their own outcomes OR are only controlled when problems arise	Independent quality control evaluates training providers
Program accreditation for upper secondary pathways is mandatory	VET programs are not required to be accredited	Some VET programs are required to be accredited, but accreditation is school/city only	VET programs are required to be accredited at the State/regional level	VET programs are required to be accredited at the national level
Program accreditation for tertiary pathways is mandatory	No tertiary VET exists	Tertiary VET programs are not required to be accredited	Tertiary VET programs are required to be accredited at the State/regional level	Tertiary VET programs are required to be accredited at the national level
Accreditation agencies are independent	VET programs are not accredited	Schools and training providers accredit their own programs	School boards/local government accredit VET programs	VET accreditation is independent of the school/local area (i.e. state)
Feedback & Updating Phase				
System design reformed or updated to respond to issues and policy gaps	Not at all	Yes within social or legal framework that prevents dual VET or other major change	Yes within social or legal framework that allows for dual VET/major change	Yes freely
Support for improvement/update in qualification content	Not at all	Yes but only because VET qualifications are meaningless	Yes but it would be very difficult	Yes freely
Data, research, and reports are available to decision makers and stakeholders	No data collected	Data is collected but never shared	Data is collected and findings are shared, but analysis or linkage is lacking	Data is collected and findings are shared
Feedback collected and shared on system and reform effectiveness	No data collected	Data is collected but not on labor market outcomes, or but is not shared	Data is collected on labor market outcomes but data or analysis issues exist	Data is collected and findings are shared and labor market-relevant
Students earn nationally recognized qualifications	No recognized qualifications	Most qualifications recognized in local area/city	All qualifications recognized at least in state	All qualifications nationally recognized
National qualification standards guarantee transitions between levels and types	No recognized qualifications	Qualifications only signify completion	Qualifications only allow entry into employment or further VET	Qualifications allow entry into further VET and academic education
Access conditions for further pathways are clear to all participants	No further pathways exist for VET graduates	Some further options are possible but are individual trajectories not pathways	Further pathways exist but are unknown or unclear	Further pathways exist and access conditions are known and clear

Alternative:	Pathways after secondary VET are completely unclear	Some pathways are well known but all other options are unclear	Pathways are clear but information is not well disseminated and many students are unaware	Pathways are clear and all students are aware of all possible post-VET options
Youth labor market situation: data for KOF YLMI are available	No YLM data is collected	Some YLM data is collected, but not shared OR data is for the general LM only	YLM data is collected and shared, but does not link back to educational careers OR is difficult to get	YLM data is collected and shared and links to educational careers
Monitoring of efficiency, effectiveness, and equity	VET outcomes are not monitored	VET outcomes are poorly monitored without analysis	VET outcomes are monitored but data limitations prevent usable feedback	VET outcomes are monitored and feedback is useful
Support for social equity by constant improvement of access	Social equity is not considered	VET is available to all but structural limitations preclude some students	VET is available to all without structural limitations	VET leadership constantly seeks out opportunities to improve equity and access
Pathways are clearly linked and permeable, including traditional education	No VET pathways exist	VET pathways lead to employment	VET pathways lead to employment and higher VET OR only some pathways are fully linked	All VET pathways lead to employment, higher VET, and academic education

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