

CLOSING THE FUTURE SKILLS GAP IN LATIN AMERICA AND THE CARIBBEAN THROUGH APPLIED LEARNING INNOVATION

Rodrigo Filgueira*

* Technology Enhanced Learning Specialist at the Inter-American Centre for Knowledge Development in Vocational Training of the International Labour Organization (ILO/Cinterfor). Engineer in Computing by the Faculty of Engineering of the University of the Republic in Uruguay. He has been working for twenty years in vocational training, technologies applied to training and pedagogical innovation. He is currently researching and providing technical cooperation to professional training institutions in the use of new methodologies and technologies for training based on student-centered models. Montevideo, Uruguay.
E-mail: filgueira@ilo.org

Received for publication on 9.24.2018

Approved on 11.14.2018

Abstract

The article categorizes the skills required for the future of work identified in recent researches led by the International Labour Organization (ILO), the Inter-American Centre for Knowledge Development in Vocational Training (Cinterfor) and other institutions. Then, recommends that the skills gap in the labor market of Latin America and the Caribbean can be narrowed by innovation in the Vocational Education and Training institutions. For this effort, propose that problem-based learning and quality apprenticeships pedagogies are fundamental teaching methods for student's achievement in soft skills.

Keywords: Quality apprenticeship. Vocational Education and Training. Project-based learning.

1. Introduction

The labour market of the future, as characterized by the future of work concept, will demand skills, which the students in the Vocational Education and Training (VET) system are presently not developing.

The argument in this document shows that this future of work related with skills gap is the same as the one presently and strongly affecting the Latin America and the Caribbean (LAC) region, in particular when referring to soft-skills. Given the similarity between both sets of skills, those applied by VET systems in other regions can inform the region's strategies aimed at narrowing the skills gap.

However, resistance to change as well as unstable political and economic scenarios in the region add to why innovations, and the risks they bring along, take so long to be tested and integrated.

It is nonetheless true that during the last thirty years almost all VET systems in the region have gone through minor and major

reforms. During the late 90s and until the late 2010s Vocational Training Institutions (VTIs) adopted competency based training and quality assurance approaches, which required great investments and risk-taking. Many institutions also introduced support for applied research, innovation centers, and innovative learning approaches.

Actually, since the late 2010s, some member institutions from the Inter-American Centre for Knowledge Development in Vocational Training (ILO/Cinterfor) – a technical service of the International Labour Organization (ILO) – have been introducing new strategies to match the needs of the labour market. In Brazil as in Colombia, VTIs have mainstreamed new learning approaches into curriculum with varying degrees of success in terms of actual implementation. In El Salvador, interest from the plastic sector is generating demand for apprenticeships/dual approaches. This is also true in the Dominican Republic in relation to other sectors and enterprises.

The labour market in LAC displays the widest gaps between skills supply and demand

Although people will probably not see sweeping reforms in the short run, there are many VET programs already experimenting with these two relevant innovations for the future of work and the present LAC labour market, namely, Quality Apprenticeships (QA) and Project-Based Learning (PBL).

In this perspective, the initiatives VTIs are implementing should prove that these methods are more effective for the development of soft skills; demonstrate these two approaches are complementary in methodological terms; and prove that if VET systems are expected to deliver for the future of work, both need to be applied.

2. Context

2.1 Skills gap

Economies in the LAC region have been suffering from low and stagnated productivity for quite some time now (ECLAC, 2012). According to the Organisation for Economic Co-operation and Development (OECD) all involved actors recognise that the workforce often lacks the right skills, an argument particularly supported by employers and seen by them as one relevant cause for the region's productivity woes (MELGUIZO; PEREA, 2016).

The same OECD report indicates that of all economic regions in the world, the labour market in LAC displays the widest gaps between skills supply and demand. This finding is supported not only by reports from other think tanks – Economist Intelligence Unit (EIU); consultancy firms (McKinsey, ManpowerGroup); and multilateral development banks, like the Inter-American Development Bank (IDB) and the Development Bank of Latin America (CAF) –, but from research carried out by governments and public institutions from the region (VARGAS ZUÑIGA; CARZOGLIO, 2017).

Given that the region has traditionally been an importer of technology and production processes one can be tempted to believe this gap is mostly made of skills related to specific machinery, materials or processes. Although this is still true, it misses a big part of the issue.

The set of skills presently in demand, which workers seem to be lacking, now include soft skills and count as much as the technical skill-set. The studies carried out by the National Apprenticeship Institute (INA) in Costa Rica and by Chilevalora in Chile (CALVO SANTANA; COTO CALDERÓN; VARGAS JIMÉNEZ, 2016; COMISION DEL SISTEMA NACIONAL DE CERTIFICACIÓN DE COMPETENCIAS LABORALES, 2015) confirm the previous assertion. In these studies, employers identify teamwork, assertive communication, lifelong learning, autonomy, adaptability and conflict resolution as main skills all the workforce is lacking.

It is important to note that VET systems are not entirely responsible for the existing skills gap. The region suffers from serious deficits in basic skills that should have been acquired before the student enters the VET system (BUSSO; AMBRUS, 2016). On the other hand, much of tertiary education offers learning of dubious quality (CASTRO; NAVARRO, 2016). Finally, enterprises may not always be allocating the right skills to the right position (OECD, 2018).

2.2 Skills for the future, now

In 2016, ILO/Cinterfor carried out a study aimed at the identification of the skills required for the future of work, in order to inform its member institutions (CINTERFOR, 2016). During this process, reports from the IDB, the World Economic Forum (WEF), the OECD, the EIU and the partnership for the 21st century learning (P21) were analysed and systematized.

The study identified about 40 different skills, which align with the ones identified by INA and Chilevalora. For the purpose of this document, comparing the sets of definitions in order to build the following two tables describe how these future-demanded skills are part of the ones indicated by INA and Chilevalora.

Table 1 - Correlation between soft skills for the future of work and those identified by INA

INA	IDB + WEF + OCDE + EIU + P21
Teamwork	Collaboration + Communication + Decision-making, emotional intelligence, negotiation, service orientation, personal responsibility.
Autonomy	Personal responsibility, research, problem resolution, critical thinking.
Assertive communication	Communication.
Relationship development	Life and career, local and global citizenship, communication, collaboration, critical thinking.

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Professionalism	Personal responsibility, service orientation.
Conflict resolution	Communication, emotional intelligence, negotiation, social responsibility, critical thinking, people management.
Disposition	Personal responsibility, life and career.
Adaptability	Adaptability, critical thinking, cognitive flexibility, research, creativity and innovation.
Orientation to quality	Productivity, personal responsibility, creativity and innovation.
Continuous learning	Learning to learn, metacognition, critical thinking, cognitive flexibility.
Leadership	People management, communication, decision-making, emotional intelligence.
Resource management	Financial and economics knowledge, productivity, people management, personal responsibility, environmental consciousness.

Source: Own depiction.

Table 2 - Correlation between soft skills for the future of work and those identified by Chilevalora

Chilevalora	IDB + WEF + OCDE + EIU + P21
Communication	Communication
Teamwork	Collaboration + Communication + Decision-making, emotional intelligence, negotiation, service orientation, personal responsibility, local and global citizenship.
Problem resolution	Research, critical thinking, creativity, innovation.
Continuous learning and initiative	Adaptability, learning to learn, metacognition, critical thinking, cognitive flexibility, creativity and innovation.
Personal effectiveness	Personal responsibility, service orientation, decision making.
Safety and self-care	Personal and social responsibility.

Source: Own depiction.

Even if there were to be slightly different interpretations for these definitions, communication, collaboration, adaptability, lifelong learning, critical thinking, creativity and innovation, personal responsibility and decision-making seem to be in demand by today's labour market and the one of the future.

VET systems have to systematically start developing these skills right away, the labour market needs them and given that the fifteen-year-olds VET students will be twenty-seven by 2030, if the region is to profit from its demographic bonus (INTERNATIONAL LABOUR OFFICE, 2013), they need to be equipped with these skills by then.

2.3 Teaching and learning are not the same thing

VET systems in the region have been slow to acknowledge this new scenario, probably because enterprises have only recently started to see the value in soft skills. This has slowed down the push towards the introduction of innovations in the design and delivery of VET.

To this day, most learning design and delivery in the region follow traditional approaches where teacher and content remain the centre of instruction. Lecturing and assessment of fact retention are still a widespread practice.

Another innovation that would help narrow of the region's skills gap is Quality Apprenticeships

Even in vocational training, where curriculum design is competency based, integrating knowledge, skills and attitudes, soft skills tend to be taught as independent and content wise topics while technical knowledge is still mostly taught in the frame of the artificial theory/practice dichotomy. Furthermore, the trade is taught as independent modules, which limits the development of an integrated understanding of the future work environment, structure and processes.

There is nonetheless hope; a growing number of VTIs are experimenting new approaches to learning. The National Training Service (Sena) from Colombia has instituted a project-based approach for all its curriculum design since the year 2007 (RINCON, 2018). The National Service for Commercial Apprenticeship (Senac) in Brazil has introduced a similar approach and has been applying it across the board since 2015. SNA Educa in Chile has recently started PBL pilot projects in 15 learning centers. The National Institute of Technical - Vocational Training (Infotep) in the Dominican Republic is starting a pilot programme this year (2018) and in 2014 Guatemala's Technical Institute for Training and Productivity (Intecap) introduced project-based learning as a base methodology for the development of meaningful learning.

Another innovation that would help narrow of the region's skills gap is Quality Apprenticeships. The region has a lot of long-standing legislation on apprenticeship contracts, which attests the interest of VET systems in this approach. However, in most of the region, even in countries with solid VET systems as Brazil, Costa Rica or Peru, the penetration of the apprenticeship approach stands at a meager 1-3% (VARGAS ZUÑIGA; CARZOGLIO, 2017).

Among the many variables that help explain these low levels of engagement in apprenticeships are enterprise, union culture, government labour policy, macroeconomic instability and again, the lack of work readiness VET students tend to show.

Given these skills deficits, the hiring of apprentices may become more a problem instead than a benefit. This scenario makes many enterprises weary of engaging in apprenticeships. For example in Colombia, where the law establishes the number of apprentices enterprises should hire is established, many prefer to pay a fine for each non-hired apprentice instead of hiring one.

Many of the conditions, which hinder the adoption of apprenticeships, should find adequate responses in the ILO/Cinterfor quality apprenticeship approach (AXMANN, 2018). Many of the member institutions are requesting technical cooperation in this field. This is nonetheless the focus of this document. This paper only aims at analysing the role of learning innovations in the narrowing of the skills gap affecting the region.

In summary, the LAC region has been suffering from serious productivity stagnation and one of the causes is the skills supply and demand mismatch. In particular, concerning soft skills, one reason for this scenario is that VTIs still rely on traditional learning approaches, which are weakly linked to the reality of the world of work and do little to compensate learning deficits students bring from their previous formal schooling. In order to bridge this problem, VTIs are experimenting with learning innovations, which need to become mainstream.

3. Methods for the narrowing of the skills gap

Being the LAC region the most unequal in the world, access to quality education has remained largely a benefit for the few. Recently the number of students attending formal education has seen a dramatic increase; however, the impact on learning outcomes has been sluggish (BUSSO; AMBRUS, 2016).

The organization of work has been changing for the last forty years and it will continue to do so by demanding new skills, which traditional approaches to learning have and will not be able to deliver.

It is in fact striking that those who did well under the traditional teaching approaches and suffer from this lack of soft skills. The failure of educational systems to cope with change and provide workers with tools to adapt and continuously learn has prompted a call for a reskilling revolution (WORLD ECONOMIC FORUM, 2018).

A reskilling revolution may work for adults already integrated in the labour market, but it would be a loss of time and effort to educate and train the younger generations

It would be a loss of time and effort to educate and train the younger generations through traditional approaches

through traditional approaches just to find that sometime later their skills are outdated and there is need for a second reskilling revolution.

The kind of education, which yesterday helped develop successful adults for the labour market, which failed them in this new scenario should not be the one offered to younger generations.

The following subsection will focus on two learning approaches; QA and PBL, which when thoroughly applied to foster the development of the demanded soft skills.

3.1 What is the meaning of Quality Apprenticeships?

Quality Apprenticeships is a unique form of vocational education/training, combining on-the-job training and school-based learning, for specifically defined competencies and work processes. QA is regulated by law and is based on a written employment contract with a compensatory payment and standard social protection coverage. A formal assessment and a recognized certification come at the completion of a clearly defined period of training. Apprenticeships combine: (a) gaining professional experiences that are directly applicable at workplaces; and (b) learning applied knowledge and skills that enable apprentices to understand the logic behind the jobs tasked with, cope with unpredictable situations, and acquire higher level and transferable skills.

Other work-based programs exhibit some but not all of the characteristics of apprenticeships, notably duration, assessment and certification (see Table 3).

Table 3 - Attributes of Quality Apprenticeship (QA) and other Workplace-Based Training

	Wage	Legislative framework	Programme of learning	Off-the-job training	Social Security	Formal assessment	Recognized certification	Duration
Traineeship	Maybe	No	No	No	Yes	No	No	12-24 months
Internship	Maybe	No	No	No*	No	No	No	3-6 months
Informal apprenticeship	Pocket money/ in kind	No	No	No	No	No	No	Variable
Industry attachment	Yes	Maybe	Maybe	No	Maybe	No	No	
QA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fixed 1-4 years

Source: Adapted from ILO (INTERNATIONAL LABOUR OFFICE, 2012).

* Some interns are studying at universities/graduate schools while doing an internship.

Despite the clear advantages of the attributes of QA – as shown in the Table 3, which make it the “Gold Standard” in vocational education and training – there is still resentment against apprenticeships, which can be summarized in the following three points of mistrust in quality apprenticeships:

Myth 1: Apprenticeships are only for advanced economies

Austria, Denmark, Germany, Switzerland, and some other European countries as well as Australia are known for well-established traditions of apprenticeships. It may thus seem that only advanced economies can implement apprenticeship schemes.

Of course, this is not true, as can be seen clearly from building blocks of quality apprenticeships in the toolkit. In fact, ILO/Cinterfor is supporting many QA initiatives in middle-income like Brazil, Costa Rica, Jamaica, and Mexico as well as in some low-income countries like the Dominican Republic.

Myth 2: Apprenticeships are only for men

Apprenticeships are associated with traditionally male-dominated trades (e.g. technicians, carpenters and plumbers). In reality, apprenticeships are offered in a wide range of fields such as agriculture, manufacturing, finance, business administration, law, media, and healthcare. In fact, many young women participate in apprenticeship programs. Statistics show that about a half of apprentices in Denmark and the United Kingdom are female. The share of female apprentices is over 40 percent in Germany, Indonesia, Italy and Switzerland (INTERNATIONAL LABOUR OFFICE, 2012).

Myth 3: Only large companies can offer formal and quality apprenticeships

Although it might be true that large companies have higher capacity (e.g. more staff members who can mentor apprentices, more budget for training, more modern equipment) to offer apprenticeship positions, small and medium-sized enterprises (SMEs) do not shy away from offering apprenticeship programs. In fact, the vast majority of apprenticeship programs are offered by SMEs, for instance in Austria, Germany and Switzerland. SMEs join forces with local schools and take in apprentices. Policy support for SMEs is important.

3.1.1 The benefits of apprenticeships

Thus, the benefits of apprenticeships are multi-fold and they accrue to all stakeholders:

- **Facilitate school-to-work transition**

Securing the first job can be really challenging for young people. One reason for this is that employers, not only in LAC, are reluctant to hire young people whose productivity is unknown because it is difficult for employers to fully apprehend technical and soft skills of young jobseekers during a recruitment process.

Apprenticeship programs allow employers to train the workers their enterprise needs while apprentices have the opportunity to demonstrate his/her productivity potential to employers as well as making well-informed choices about education and training.

- **Apprenticeship makes good business sense**

Companies invest in apprenticeships because it is sound business; a skilled workforce enhances productivity (LERMAN, 2014). The benefits amassed to businesses far outweigh the initial challenges of new apprentices who require more supervision and coaching. Companies recover the training costs, accrue net benefits as apprentices learn the trade, and become productive. Importantly, companies can also save recruitment costs since apprentices have lower turnover rates.

- **Cost-effective delivery of vocational training**

Finally, the costs and effort required for training institutions to catch up with fast-changing technologies and ever-changing skills demand are substantial. Anticipating future skill needs, equipping vocational schools and training centres with the latest facilities and tools, updating curricula and training modules as well as re-training instructors easily inflate the costs. Partnerships between training institution and industry allow the former to tap into resources of companies (e.g. equipment and facility, accumulated expertise) and the latter can also benefit from the partnership as discussed above. Government actors in charge of vocational education and training may wish to explore opportunities to utilize existing resources before embarking on costly reforms of the VET sectors in Latin America.

- **Reduction of the skills gap through direct action and spill over effect**

Apprenticeship schemes are a systematic means of forging collaboration between VET providers and industry. Employers are often critical of the skills of job seekers, ascribing it to a mismatch between education and their needs. In order to help ensure that new recruits are “job ready”, companies need to be much more actively involved in training, ideally through collaboration with local education/training institutions in the design and delivery of curriculum/training modules.

Given the high rate of apprentices that remain in the enterprise once the apprenticeship is over, it seems clear that for those enterprises and apprentices the skill (specific and soft) gap was significantly reduced. It follows that a strong boost in apprenticeships would naturally help narrow the skills gap.

The apprentice holds a wide range of soft skills

On top of that, apprenticeships require apprentices who are mature enough (VAN BUER, 2013) to actually benefit from this kind of programs. Being apprenticeship-ready implies that the apprentice holds a wide range of soft skills, which need to be developed either by pre-apprenticeship processes or by the VET system.

Quality apprenticeships are mechanisms that systematically bring education and training institutions and industry closer, thereby reducing skills mismatches and skills gaps.

3.2 Project-based learning

PBL is a form of Inquiry-Based Learning (IBL), an approach that aims at students building their own knowledge through research and observation (OGUZ-UNVER; ARABACIOĞLU, 2014). On top of these strategies, in PBL the student learns through a process of analysis, planning, development and testing a solution for a real world problem. It dates from the beginning of the 20th century but only gained momentum during the 70s in Northern and Central European countries (KNOLL, 1997).

PBL is a formal tool to put into practice many of the benefits constructivism brings to learning. Many American pedagogy theorists like Merrill, Jonassen, and Kolb have

also aligned with the main principles of working via projects (JONASSEN, 1999; KOLB, 2000; MERRILL, 2002).

Although it is difficult to give only one definition of what PBL means, its main characteristics are:

- Learners are challenged via a driving problem for which they must find a solution.
- The problem at hand must be realistic and require a realistic response.
- Learners must carry out research to understand the problem and to build solutions.
- Learners organize and schedule their own activities up to a certain degree.

Other threads of PBL have added quite consistently the following characteristics:

- Projects are carried out by groups of learners and not by individuals alone.
- In courses and programs linked to trades and careers, projects should follow stages and methods used by that industry.
- Actors, external to the learning process and experienced in the trade should assess the project advance and results regularly.

Although there is little formal research before the 90s and its quality is very heterogeneous, results support the thesis of IBL being more effective for the development of soft skills (THOMAS, 2000).

More solid evidence regarding effectiveness comes from research that confirms that active and meaningful learning is more effective than the traditional theoretical-practical approach via lecturing (PRINCE, 2004).

3.2.1 Soft-skills related benefits of PBL

Students develop communication and collaboration skills through teamwork, by presenting results and jointly assessing the project and learning process. They also need to interact with people and roles outside the learning process where they exercise communication skills according to the interlocutor and context. They can even face the need to collaborate with the client in order to better establish the problem at hand and get feedback on their progress.

Critical thinking skills are exercised through the need to research and contrast information, validating information sources and assessing their peers work. Students also assess the results of their work in relation to decisions taken earlier, which trains cause-effect analysis. They also need to understand the various variables affecting their area of work and/or productive sector.

Creativity is a need for problem solving. These skills are developed through context analysis, design and implementation of solutions for real trade-related problems as well as for smaller technical and project management related issues along the way.

One issue remains at large, however. How is PBL better than traditional designs at developing soft skills? Students will not spontaneously develop these soft skills unless into learning design and teacher training.

PBL generates didactic opportunities to develop critical thinking, communication, collaboration and problem solving through research, reflection, teamwork and decision making activities. Nonetheless, these activities need to be designed carefully and rely on teachers who can methodologically support them.

This section has shared short descriptions and the benefits the suggested approaches would bring in order to deal with the soft skills gap. The next one will now discuss some issues and one strategy for the process of integrating both innovations into the VET systems in the region.

4. How to go about integrating QA and PBL into VET

Given that both described approaches (QA and PBL) would help narrow down the soft skills gap, how VET systems should integrate both of them into the region? Furthermore, would there be any challenges for their joint adoption?

As told before, many institutions have started to try out these innovations, however, even if it varies, internal resistance has been identified everywhere. VTIs should integrate these approaches in phases, which should help break down resistance by demonstrating their benefits, and the organizational changes required for a successful implementation. One suggested sequence of phases for one of Cintefor's member institutions in Central America follows:

Phase 1: On demand by a specific enterprise or sector, VTIs must establish a specific agreement that follows the QA approach. Enterprises should be the ones requesting QA and VTIs should make sure that all social partners are engaged so that social dialogue can take place and provide the ground for building the pedagogical process. VTIs should carry out these initiatives as differentiated programmes from those running the VET system so to get less attention and thus resistance from the system's *status quo*.

Phase 2: The QA initiative will require specific pre-apprenticeship efforts on top of their VET experience so that to-be apprentices can level in mathematics and language as well as to develop the soft skills required to be apprenticeship-ready. These efforts should include a project-based learning approach, which as we have seen is the most effective for the development of soft skills.

If this phase is run-thoroughly, enterprises will acknowledge that in terms of soft skills, workers coming from the labour market or the VET system had actually better prepare apprentices. The VTI should thus make clear that this happens because of the learning approach used in the pre-apprenticeship efforts.

Phase 3: During the previous phase, the institution would have already developed expertise in PBL training delivery as well as PBL supported QA. At this point, the institution must invest in building a core PBL + QA pedagogical team and the creation of a training of trainer package.

Overall infrastructure, administrative and teacher training needs would have also been identified and this knowledge should be integrated into a change management document guide. The administrative team in charge of this must conform a second PBL + QA change management team. Both teams and training packages are the base for the mainstreaming of the QA + PBL approach.

Phase 4: Mainstreaming takes place through training of trainers and institutional interventions aimed at adjusting administrative and infrastructural conditions. In

The existing soft skills gap in the region closely matches the skills gaps identified for the labour market of the future

order to support this process, the institution should carry out workshops where teachers and instructional designers develop PBL interventions while bearing in mind competency profiles and curriculum designs, provide a knowledge base of projects and course design and continuous training and report on the results of the methodology.

Cinterfor suggested these phases for one specific institution in one specific moment, and may thus be subject to changes depending on more contextual analysis. The overall structure is nonetheless one where all the relevant actors in a LAC VET system would engage before trying to implement changes of such magnitude.

Through this process, employers would be on board due to their interest in better a more effective workforce. Unions and government would be on board due to their natural obligations with the worker/student and with productivity and development, in the frame of constructive social dialogue. Once all three parts, which compose the institution's board, are aligned with these changes, institutional resistances can be addressed.

There are other situations, where institutions are more open to change or where the top-down approach can be applied from the beginning. These scenarios, which are more favourable for the introduction of innovations, should nonetheless approach this change process from a social dialogue perspective in order to be (more) sustainable.

5. Final considerations

As mentioned previously, the existing soft skills gap in the region closely matches the skills gaps identified for the labour market of the future at a global level. It follows that identifying VET approaches for the closing or narrowing of the present region's skills gap becomes the same exercise as looking for tools to narrow future of work skills gap.

The analysis and sharing of two approaches have proved effective in the development of soft skills. On the one hand, Quality Apprenticeships for school to work transition, on the other project-based learning for all things VET.

Ideally, project-based approaches should support quality apprenticeships, at least during pre-apprenticeship efforts, but probably during the whole apprenticeship. On top of that, it would be safe to say that medium-term rates of apprenticeship participation in the region will not exceed 20%. If 80% of students were expected to also be able to display the right soft skills when leaving the VET system, PBL should be applied across the board and not only during QA activities. Therefore, at least in the LAC region, QAs needs PBL and the labour market needs VET to thoroughly implement both approaches.

In 2019, among other activities, Cinterfor plans to support Infotep in its pilot QA and PBL programs design and implementation and publish with Senac results of research over instructor strategies for teaching and assessing soft skills. A book containing a regional review of the use of PBL in VET in the region is also to be published. In addition, Cinterfor will start the joint development of a PBL implementation toolkit for VET for Latin America.

Further research should be carried out in order to understand at least two variables, which hinder the implementation of these approaches at the pre-apprenticeship level; (1) the effect of Competency Based Teaching (CBT) design in learner-centered teaching and (2) the effect of teacher turnover in the sustainability of these innovations.

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