

Article Title: Virtual education in professional training areas in times of COVID19

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1. SUMMARY

Technical vocational training mainly uses the face-to-face modality because it must develop competencies based on skills and abilities. However, the current context, with an overpopulated, globalized, technological and hyperconnected world, which demands the massification of training services and the pandemic and confinement during 2020, oriented professional training towards the use of the virtual modality, but this required an almost complete reconversion of the training and administrative process in vocational training institutions.

2. INTRODUCTION

The star product of vocational training institutions -VTI- is the long-term career with a face-to-face training strategy and dual modality (education and internships in training workshops and in companies), because this type of training product leads a person from knowing nothing about a technical specialty until obtaining an occupational certificate. As a complement to occupational training, careers or courses of medium duration are offered that allow the technician to specialize in a specific area, and short courses promote the updating of content and technology.

It is also known that the labor sector and, therefore, professional training and education are classified at the executive, middle and operational levels, the latter being the one that most requires technical training because it needs more development of physical skills trained in workshops than of skills educated in the classroom.

For years, the training model of VTIs oriented to a systemic, comprehensive and constructivist approach (Planning, 2015) has been based on a strict and complete planning of training sessions according to the training plan and the learning results. In addition, it identifies and classifies well the profile of the participants before, during and after the training, differentiating profiles according to technical specialty, for example, a participant in auto mechanics has a different profile than the participant in data networks, application development, gastronomy or cutting and confection among others. The differences of each profile include social, economic, academic, cultural, personal issues, etc., which are not related to the human value of people or their dignity, which is clearly equal and very high, they are rather characteristics to be analyzed to better serve their training.

However, the training supports and resources, as well as the administrative processes, are mainly aimed at face-to-face training. In the era of computer technology, the internet and information, digital transformation and innovation, and Industry 4.0 (Cotteleer & Sniderman, nd), virtual training was considered the trump card for any eventuality, however, it was not.

On the other hand, the term Virtual (Spanish, *sf*), which seems synonymous with the prefix Tele, nowadays accompanies many other terms such as work, communication, presence, reality, desk, evaluation, education and of course training, in reality it began to be used when the dimensions of time and space or distance began to complicate human life, that is, if I cannot be somewhere at a certain time because it is far or it is very difficult to get there (due to heavy traffic, for example) then I need virtual resources. Virtuality challenged technoscience (Medina, nd) and promptly incorporated other concepts such as augmented reality or reality created for the avatar and eventually tries to make the virtual experience more intense than the real one, although in reality, if we were to be strict with the subject, virtual reality is still a long way from surpassing real life experiences, precisely because they are so much more complete and complex.

Additionally, the term distance training (<https://www.educaweb.com>, nd) reappeared on the scene in the last 20 years trying to automate, systematize, technify, digitize and even reinvent the education / training that was carried out with physical media in different forms throughout human history. Many attempts failed because they tried to digitize traditional resources or methods without reinventing them, or because it was not their time or simply because, as much happens with technology, they failed to become fashionable.

Today there are many terms that compete to win the commercial battle and impose themselves on others, even in different languages, but most of them do not have a concrete or easily interpretable definition, or their meaning is different when the context changes and, therefore, we all make our own conceptualization, interpretation and use of them, although we refer to different things. For example: training, certification, online, virtual, synchrony, evaluation, tutoring, content management, learning manager, e-learning, didactic resource, teaching process, learning process, etc., which by now ended being ambiguous and of indiscriminate use.

Perhaps at this time we could apply to education / training that famous phrase by Mario Benedetti: "When we believed that we had all the answers, suddenly all the questions changed" (Haiku, 2017).

3. DEVELOPMENT

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The current context

The current context has several dimensions that must be considered in training models, for example, we have never before had more than seven billion, seven hundred million inhabitants in the world (Population City, 2020). In the last 120 years, the world population grew from 1.65 billion to more than 7.7 billion people (Llamas, 2019), this represents an approximate growth of 466%. By 2008, more than 107 billion people had been born and lived on earth during humanity's 162,000 years, according to calculations by statistician Peter Grunwald at the Netherlands Center for Mathematics and Informatics (Grunwald, 2008), for this year we must be approximately 108 billion, therefore, 7.13% of human beings who have been born are alive at this time.

We have never had so many people alive at the same time, we have never been so dispersed, nor have we had so many possibilities to move and interact globally, just as we have not been hyper-connected and with such a need to subsist in family, socially, economically and professionally, among other factors.

All this meant that every day we had to be more efficient, effective and effective in what we do and, therefore, constantly measured with indicators of all kinds. The implementation of the "ef" (efficient and effective) in today's society has a high cost on the quality of life of human beings because they have reduced or eliminated everything that does not explicitly contribute to the activity that is being carried out, in education they have reduced or eliminated things such as: basic sciences (mathematics, physics, chemistry, others), subjects such as geography, natural sciences, history or sociology, common or social areas such as gardens, dining areas, frontispieces, recreational areas or sports, etc.

As part of this current context, it should also be noted that the figure of the artisan was reduced or completely eliminated for different reasons, among them industrialization or globalization could be highlighted, people work outside the home in an industrial, administrative or executive area, in addition, the proportion of women in the labor market is increasing and therefore, it is no longer the parents who teach technical activities to their children, perhaps there is no one to serve as a work or professional model for their children, they will have to look for it in the virtual world.

And, of course, we must always strive to ensure equal opportunities, providing more to those who need the most, to ensure equivalent results (access, resources, learning outcomes). Inclusion is related to the access, participation and achievements of all students, with special emphasis on those who are at risk of being excluded or marginalized (López, 2005). It is a conception of education based on diversity and not on homogeneity.

Therefore, today technical training requires an adaptation process for overcrowding with complexities of time and space, however, the training of competence or mastery of a specialty that requires the development of know-how and mainly skills continues to demand presence, whose main difficulty is the cost of having a workshop with equipment, tools, materials, instructors, methodologies and special facilities ready and with an installed capacity limited to 25 or 30 people.

Distance training

Distance training, which can be physical or digital, has a worldwide tendency to be used as a complement to training / education, being a complement to training suits it very well because it can be short, specific, specialized and even audiovisual / multimedia (Wikipedia, nd). It is not used in the initial stages of training because participants / students may even require reading comprehension training, digital skills and prior access to use it. In addition, digital distance training, also known as virtual training (Wikipedia, n.d.), is not recommended in human childhood or adolescence. Of course, this topic also provokes much analysis and discussion.

Because it is complementary and mainly oriented to adults, with access to technology and digital skills (VUORIKARI, PUNIE, CARRETERO GOMEZ, & VAN DEN BRANDE, 2016), virtual training also has a spontaneous tendency to business courses, computer science and information technology, language training and lately data science. Of course, the offer is more diverse, there are courses in art, science, comprehensive personal development, personal care, etc., but they are consumed in less quantity. In addition, the permanence levels are quite low. In many cases, perhaps less than 20%, it seems that the participant is satisfied with satisfying specific doubts about technical training, discarding the rest of the course, perhaps the incorporation of the "efs" in current culture and society.

On the other hand, complete virtual training tools are proliferating that offer technical certifications with free courses, however, in reality they do not manage to form technical competencies (abilities and / or skills) precisely because they are theoretical courses.

Surely, most VTIs have distance training units or virtual training with learning management systems (LMS) and a training offer with didactic resources and methodology according to local demand and its possibilities as an institution, with opportunities for improvement and growth, but with computing infrastructure dimensioned to meet a demand with the characteristics described in this section of the article, not to support the full load of long-term classroom training.

Here it is worth highlighting one of its main differences, virtual training as a complement does not establish a defined study regimen, it may have synchronous telepresence sessions (Wikipedia, sf) or not, it is strongly based on the participant's self-training, on the other hand, long-term occupational technical training has regimes of 5 days a week with synchronous face-to-face sessions of 5 hours in the workshop. That is to say, it is not the same to "hang" multimedia content in an LMS so that it can be consumed by many students with digital skills and when they can or want, than to produce and transmit technical training sessions daily (without the necessary training resources because the instructor is at home) with a duration of 5 hours to be consumed at the same time by 25 or 30 students without digital skills, and also, the number of technical careers that are being developed at the same time must be considered.

In short, the virtual training units and their infrastructure had to be strengthened to meet this new and different demand for resources, almost to the level of a complete reconversion.

Before the pandemic

Before the pandemic, technical training was mainly face-to-face, the Training Centers did not have computer laboratories available so that participants could use a virtual classroom or learning management system (LMS) to complement their training, their main resources outside the classroom were the printed technical manuals that they often did not acquire or their notebook of handwritten notes, taken during the class session. In some countries the internet

was possibly also a resource with platforms such as YouTube, but in most Latin American countries access to the internet or electronic devices is very limited due to lack of connectivity, lack of money or lack of the now famous digital skills.

Then, since virtual training or distance training was not used as a complement to face-to-face training, it never had the interest or work necessary to develop. There were no or are no didactic resources, no production processes, no administration, storage or dissemination platforms, or methodologies aimed at complementing face-to-face technical training during the period in which it is carried out (1, 2 or 3 years). Virtual or distance training is used as a complement to technical training, but with another training event of medium or short duration, which deals with a specialization of a topic, but I reiterate, not as a formal complement to long-term face-to-face training while this is being carried out.

The start of the pandemic

The training cycle started as normal in 2020, the traditional increase in the attendance goals of participants once again required an extra effort to manage installed capacity and marketing, accompanied by that effort to know and attend to the country's labor market. In Guatemala it was the beginning of a new presidential term and expectations were different. In January the news of the virus began and the word pandemic spread at an incredible speed through social networks, even competing with the speed of contagion of the virus. The confinement began in the following months, it was then that all the educational and training institutions wanted to make use of the ace up their sleeve: virtual training.

The situation was everywhere atypical, if at some point we could have read the meaning of the word pandemic or some piece of history of a pandemic, in reality no one of this generation had experience in such a situation. Perhaps the first reactions of the education / training sector were thinking of short confinements, of 15 days or without specifying the number of days, which motivated short-term decisions. After a few days and in a crisis context without data or validated action protocols for a pandemic... the training had to continue.

Why should technical training continue?

The answer to this question requires deep and complex analysis in different dimensions such as education / training, society, economy, entrepreneurship, labor market, anthropology, psychology, philosophy, politics, among others, it could even appeal to civility.

For example, the word "political" comes from polis, which means "city", for Aristotle man is a "political animal" (zoon politikon), that is, we have the ability to be people when we live with other people. What characterizes the human being, among other things, is the ability to relate to others and organize themselves in a multitude of different ways and means. Besides being a "social animal", he is "political": capable of extending his sociability to the cities, of extending this sociability to a higher nucleus than that in which he himself relates. That is to say, the political characteristic of the human being serves to be able to think beyond the interests of his social nucleus.

This can be summed up in a concept as wonderful as it is abstract: "civility" (Ruiz, 2017). Civility is discovered in the day-to-day details that are undertaken in a respectful way with the citizens around us. Caring for the common resources of a society are acts of civility. Throwing out the trash instead, yielding your seat on public transportation, yielding the right-of-way in traffic when necessary, helping people with disabilities, employing when possible, etc., are acts of civility.

It is important to mention that the suspension of the training also seriously hurt the main training resource: the instructors, because most of them charge fees per hour of training provided. Now is not the time, but there are many stories about how these training heroes, co-workers for years, who have helped change the lives of many people, struggle to survive with their families in times of pandemic and confinement. Holding on to their technical knowledge and entrepreneurial skills, even following up and humanely supporting students.

From the educational / training point of view, the suspension of the cycle when it was just beginning suggested the complete loss of the year, in addition, the little certainty of the end of the confinement suggests, now that the year is close to ending and that the next year is already being prepared educational / training cycle, that possibly the next cycle is not normal either. The result could be a generation with 2 interrupted training cycles and the impact of this could drag on for a decade or more.

And it is that, unlike industrial, commercial and service activities, education, which is a special service, really achieves its long-term results. I remember a friend who, after having worked for many years in the design and implementation of breweries, working as an engineering coordinator at a university, commented that now his work was much more delicate and complex, because when beer did not meet the expected quality they knew immediately and could throw it down the drain, but when a person completes the formative stage, their professional quality can only be evaluated in the long term, and if it were bad they could not be thrown down the drain.

This friend was clear about the difference between education and industry, however, perhaps there is an error of conceptualization and practice in many educational / training institutions, calling students raw material, the training process is not an industrial process, as many have proposed affected by the pressure of the size of the population that requires education and technical training, or by the erratic and volatile dynamics of the labor market, which suggests that the training process is more a matter of industrial and computer engineering, than a pedagogical or andragogical process per se.

The opinions regarding this question are surely diverse and debatable, however, technical training, as well as education, should continue.

The first three months of training: great challenges.

Well, let us talk about the ace up your sleeve: virtual training. Administrators and instructors from all the Training Centers resumed training activities, first they got the lists of participants and when they wanted to contact them they ran into the first problem: there was no official, formal and standard communication system to coordinate the group. When the training institution is small, let's say a single venue with few specialties and few training areas, there is not much of a problem, but when it is large, many sites, many specialties, many cities, etc., the words official, formal and standard are important.

In the crisis and the desire for revival by Virtual or digital media caused the instructors to use any tool available in the telecommunications environment, some names such as WhatsApp, Kaizala, Wechat, Facebook Messenger, email, text messages, phone calls, among others, stand out. Some instructors even risked catching it or breaking the "curfew" provisions by going to pick up their students from their homes. Again, the profile of the students / participants of the professional training is varied, but many of them do not have a mid-range or high-end cell phone, the most common is a low-end cell phone and with little access to the internet or social networks. Additionally, many of these students do not use email as a means of communication,

because they do not really need it, therefore, they do not have an email account or they have many accounts because they create a new one every time someone asks for their email.

Once a means of communication was established, I repeat each instructor used what he could even use several means for the same group, then it was time to send content. This topic can be divided into at least three parts: a) the content, b) the medium and c) the training resource.

A) The content: as indicated at the beginning of this article, professional training is very well planned in every sense, but in face-to-face modality, the "blended" and "distance" modalities are implemented in medium or short-term courses, not in technical training that certifies a person as a professional in a technical occupation. Therefore, the content had to be reviewed, selected and appropriate to be taught in a "distance" mode, specifically with virtual training, facing as the main difficulty that the workshop or practice laboratory could no longer be used with all the equipment, tools, materials and special facilities. The contents and modules were reorganized to address the theoretical, for example: comprehensive personal development and basic sciences, then the technical should be retaken and the time of practice planned in the future.

B) The medium: the instructors, once again appealing to their resilience and adaptability, searched, found and used the tool they could as a means of transmission and content management, in the manner of "who can save himself." From the adaptation of WhatsApp to teach classes, through the educational tools of Facebook, and some more complex ones from Adobe, Google (G Suite), Microsoft (Office365), among others. Some did not look for content management tools, they simply looked for tools to develop synchronous sessions, for example, Zoom, Meet, Teams, Skype, Adobe Connect, BlueJeans, etc., and depending on their possibilities they got licenses, but most of the cases used the free versions. The difficulties were not long in coming: little, bad or no internet access, interruption of sessions due to disconnection or expiration of the trial period, problems using the tool, inability to see the participants and their performance, noise, poor lighting, bad interaction with students, attendance and academic control (partial and final marks), etc. And of course, difficulties in evaluating the performance of the participants and their learning, as well as the recording of evidence of progress in the training process that uses the concept of "continuous formative evaluation", that is, if the participant is evaluated all the time in face-to-face training. And, as if that were not enough, it had to attend to methodological supervision and quality supervision.

C) The training resource: the didactic resource, as expected, there is no didactic resource according to the training plan for long-term technical careers to be used in a standard way in virtual training. There are no systematic and organized production methods, or repositories of organized teaching resources, available and with access controls that can be easily linked with LMS tools and that also comply with quality standards and training method. Perhaps this that we are describing is the most difficult and expensive part (human, technical and economically speaking) of virtual training as a complement to long-term technical training.

One of the main currents within the context of virtual training is the use of multimedia resources and although there are many initiatives and new technologies such as augmented reality, the main resource is the video and audio podcast, followed perhaps by wikis and web pages with text content, infographics and photographs. However, these resources are well consumed by the user profile described in the distance training section of this article, not by long-term technical training participants, who are more used to a printed technical manual or handwritten notes in a notebook.

Although videos are the main resource today in virtual training, they are possibly not the best resource, among other things because in professional technical training a whole video

production set is required, which is even a production with "fictitious" resources and well organized so that the video has the necessary quality. With a staff for pre-production and post-production and administration of versions, publications and broadcasts of the created resource, as well as actors and props staff. The videos must also be processed so that they preserve their graphic quality and duration, but at the same time they can be sent by basic means of communication such as WhatsApp (<65 Megabytes).

And, on the other hand, the training resource produced by the participant as evidence of the practice carried out also requires a lot of work and resources, not only on the part of the student, who makes his attempt with his low-end smartphone, but also for the instructor because you surely receive the video by WhatsApp and you must organize and file the formative evidence, validating that there is no plagiarism and evaluating the quality.

Once again, we highlight the heroic work of the instructors in times of pandemic and confinement because they converted from face-to-face to virtuality, they went from giving sessions in large workshops that required a lot of time on their feet, physical activity and voice management to working in front of to a computer all day.

Three months later

As a result of the effort of the administrative staff at the institutional level and of the Training Center, and of course, of the entire community of instructors, the TECHNICAL INSTITUTE OF TRAINING AND PRODUCTIVITY - INTECAP- of Guatemala managed to implement virtual training to attend the professional training developed in long-term technical careers, maintain virtual training as a complement to training with medium-term and short-term events, including giving virtual seminars (Webinars (Wikipedia, nd)). The 3 major challenges were established as axes of work and innovation, that is, the reorganization of content, the selection and standardization of administration tools and content delivery (Institutional Moodle and MS Teams of Office365), as well as tools for the coordination of Groups of participants, supported by communication and dissemination sessions aimed at administrative and operational staff, instructors and students have been key factors, so that they know how to use the tools, produce and deliver didactic resources, and of course manage the evidence of the training .

The articulation between operational and administrative units should also be highlighted, for example: the effort of human resources for the conversion of instructors to virtual tutors, that of quality assurance to adapt management processes, financial administration and support for the budget management, the technical division with the review, update and complementation of the training offer, the planning division with the management of operational indicators, marketing with the advertising and communication campaigns aimed at permanence, the Training Centers and the Training Units. Business Services and its drive to continue producing events and supporting participants and companies, etc.

Additionally, adjustments and automation of administrative processes for the management and supervision of the training activity were made, promoting self-management and self-training.

What could come?

We are about to start the last quarter of 2020, all the training activity of this cycle must be concluded and the registration process for the next one must begin, with the complexity of the pandemic and confinement.

One of the issues that appears is the mixed modality for long-term professional training, considering measures of social distancing that require control of the capacity of the physical training areas, the mixed modality suggests that a part of the group can receive technical training in face-to-face mode and the other party will do it in virtual mode, which represents a real challenge for the entire training process because, again, the training areas are designed, organized and equipped for face-to-face training, therefore, they do not have spaces and necessary and adequate resources for a two-way transmission that allows the interaction between instructors and students who participate in person and with (virtual) telepresence in the same training session. Additionally, the spaces are quite diverse and diverse, for example: classrooms, multipurpose rooms, auditoriums, laboratories (computer science, electronics, autotronics, etc.), workshops, kitchens, beauty salons, etc., and more. It would also be necessary to have an event production staff with full knowledge of video, sound, lighting and teaching equipment.

It is also necessary to attend to the practice hours of the so-called "COVID19 promotion" because, due to the reorganization of the content, first exhausting the theoretical content, now a solution must be designed so that the participants can carry out their practice and complete their training process. In addition, we must attend to this COVID19 promotion so that they have the appropriate quality and can be inserted into the labor market in the short term, but also so that they can survive in the labor market in the medium and long term.

Virtual teaching resources for vocational training continue to be one of the main challenges in terms of their production, administration and delivery, due to costs, management staff, participant profile, technical specialty and speed of technological evolution, among other things.

The virtual modality, based on content management systems, will be enhanced with learning experience platforms that incorporate artificial intelligence and machine learning tools, and promote new collaborative learning options in a personal, attractive and personalized way. In this way, each professional can quickly and easily access the training answers they need and want, at all times (<https://www.oknlearning.com/>, 2019).

This economic parenthesis, artificially implemented through the confinement caused by the pandemic, makes the present and future labor market even more uncertain, in the short, medium and long term. Some occupations will be consolidated as basic and necessary, they will not change in the short term or because extraordinary events like the one we are experiencing happen, but many new ones will also appear, each with different validity. The race to know the labor market clearly demands greater attention, more research and application of Technoscience (Medina, s.f.).

4. CONCLUSIONS

1. Long-term professional training must incorporate virtual training as part of its training process.
2. Atypical and extreme situations require a well-formed work team ready to move forward.
3. The current context requires that digital or virtual resources are better defined for professional training and its massification with quality.
4. Education / training must guarantee equal opportunities, providing more to those who need the most, to ensure equivalent results (access, resources, learning outcomes). Inclusion is related to the access, participation and achievements of all students, with special emphasis on those who are at risk of being excluded or marginalized (López, 2005). It is a conception of education based on social diversity and not on homogeneity.
5. Virtual training is an “ace up your sleeve” but only when it is used in an organized and standardized way at the institutional level.
6. Professional training must continue, even in times of pandemic and confinement, because humanity requires it to get ahead and continue living.
7. Virtual training requires a specific definition of topics such as methodology and administration that allows implementing the appropriate technological tools (LMS).
8. With or without crisis, the education / training sector must continue its process of redefinition and innovation, because the context is different.
9. Educational technology must make a greater contribution, not only as content management and delivery tools, but also as analysis tools to improve education.
10. Knowledge of the labor market requires the use of technoscience to be able to attend it on time.
11. It is necessary to slow down the training process, so that human beings have time to learn, assimilate and exploit their knowledge and learning from it, so it will also be easier to reconvert professionally when necessary.

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