



DISTANCE LEARNING OR RESIDENT EDUCATIONAL AND TRAINING PROGRAMS? POSSIBLE SOLUTIONS TO THE EFFECTIVENESS DILEMMA IN MILITARY EDUCATION

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Distance learning used to be a highly coveted reality before the outbreak of Covid 19 pandemic. When prompted as an emergency solution, it offered manifold avenues of creativity and adaptability for educators and institutions. All of them were essential to overcome many of the stumbling blocks raised by the impromptu transition or transfer from face to face educational and training programs to distance learning solutions. However, once the WHO declared the end of the pandemic and even though the public discourse is still focused on the importance of technology and the added value it provides in all walks of life, the return of many educational and training institutions to the delivery of face to face educational and training programs tends to become the norm. The current article focuses on the necessary prerequisites for establishing distance learning programs as viable, effective and sustainable counterparts of residential programs. It offers a bird's eye view on a select number of time-tested perspectives, processes, models in the field of education and training that can be employed to assure distance learning programs' effectiveness as informed by conceptual dimensions like end users' needs, technology enabled design of DL programs, participants' support, and learners' engagement. Thus, it can assist strategic decision-making in the field of distance learning education and training programs as well as the formulation of appropriate guiding questions concerning the effective design and development of such programs.

Keywords: effectiveness; systems approach to training (SAT); organizational system's view; ADDIE (analysis, design, development, implementation, evaluation); SAMR (substitution, augmentation, modification, redefinition);



INTRODUCTION

Distance learning/DL educational and training programs can be viable, effective and sustainable counterparts for residential programs. Furthermore, distance learning can demonstrate its effectiveness if approached from the perspective of a long-term vision incurring an outcome-based approach informing specific management processes like planning, organizing, monitoring, controlling and reviewing. These are two assumptions underpinning the current article. Based on them we will delineate a select few models that inform an effectiveness-based approach to distance learning.

The method employed by the article is a qualitative descriptive approach of the relevant models in the field of designing and developing distance learning solutions based on the conceptual dimensions derived from the operational definition of the concept of "effectiveness of distance learning" provided by the 2019 report of the Chartered Institute of Personnel and Development. Additionally, the article narrows down the scope of distance learning educational and training programs to adult learners as the main target audience. Inherently, that allows for the selection of the relevant literature in the field.

According to the aforementioned source, the effectiveness of DL is the result of a multitude of factors that can be synthesized under four main threads presented below:

- **need**-based approach derived from labour market'/employers'/participants' requirements (also characteristic of residential programs);
- **technology**-enabled design of DL programs that meets requirements like compatibility across devices, ease of use, searchable content, provides means to ensure social interaction, and assures the practicability of the learning experience;
- **support** demonstrated by senior management and leadership for such programs, along with support for participants in the form

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of communities of learners and communities of practice for instructors/educators, and career management and professional development opportunities for the latter;

- means to **engage** learners such as opportunities to take control of their learning process and demonstrate autonomy, establishing goals that they can meet, personalizing content to meet learners' specific needs, and acknowledging the DL solution organization-wide as a form of motivation.

Figure 1 is a visual representation of the conceptual dimensions underlying the concept of DL effectiveness based on which the models that we deem representative for designing and developing distance learning solutions are identified.

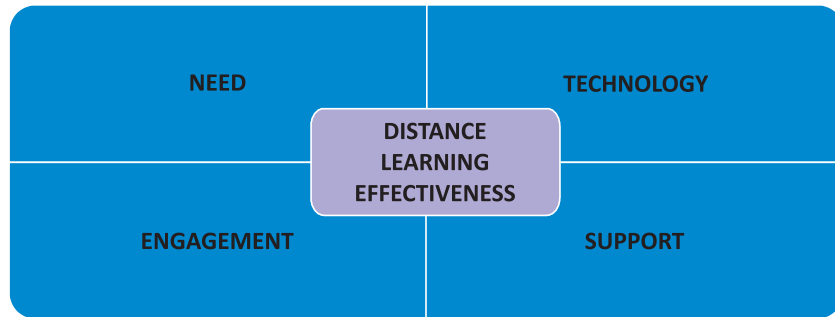


Figure 1: Conceptual dimensions ensuing from the operational definition of distance learning effectiveness

All of the above considered, we contend that establishing the necessary framework to support the decisions substantiating the need for such programs, identifying the necessary steps required to take before implementing and conducting them on a routine basis, as well as analysing the goals to be served by the technology chosen to integrate in such programs are areas that need thorough consideration. Furthermore, technology-enabled design principles and student-based learning premises are intrinsic parts that need to be factored in when attempting to solve the effectiveness dilemma. All of the above entail a comprehensive approach in relation to the major prerequisites for designing and developing such programs. Figure 2 is a synthesis of the main relevant models in this regard. Therefore, we consider



that the perspective, processes and models that guide the analysis of distance learning solutions as viable options and their design and development require the following:

- taking an organizational system's view and applying a systems approach to training (SAT) to validate DL as an option;
- employing models like ADDIE to guide the design and development of DL programs and identify the necessary support needed by instructors to conduct the courses, and SAMR to make informed decisions concerning technology integration in DL programs;
- facilitating future participants' engagement in the programs from a design and development perspective as assured by backwards design, student-centred learning and Bloom's taxonomy.

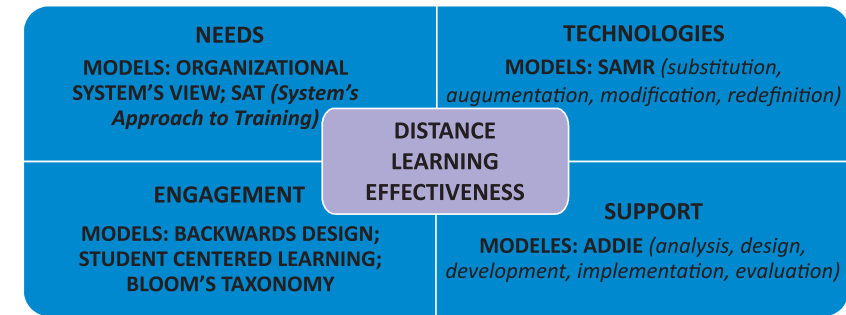


Figure 2: Perspectives, processes, models associated with the concept of distance learning effectiveness

Nonetheless, given the comprehensive nature of setting up an effectiveness framework, the article focuses only on the necessary prerequisites for establishing distance learning programs as viable, effective and sustainable counterparts for residential programs. It offers a bird's eye view and therefore it does not focus on specific quality standards necessary for monitoring and controlling the implementation of distance learning and, implicitly, on those measures of evaluation of effectiveness that can further plead for considering it the qualitative equivalent of resident educational programs. In this respect, it provides a much-needed overall outlook that can inform strategic decision-making and guide effective design and development of such programs.

Establishing the necessary framework to support the decisions substantiating the need for such programs, identifying the necessary steps required to take before implementing and conducting them on a routine basis, as well as analysing the goals to be served by the technology chosen to integrate in such programs are areas that need thorough consideration.

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SYSTEM'S APPROACH TO THE ORGANIZATION

Consolidating distance learning solutions that have already been developed during the Covid 19 pandemic, or proposing new solutions incurs first and foremost taking a system's view upon the organization as a whole. The clarity of well-established outcomes is a key aspect to factor in when reviewing the lessons identified in the field of education and training during the Covid 19 pandemic and considering the likely advantages that distance learning presents to employers, employees and educational and training institutions. Their identification depends to a great extent on any organization's mission, vision and strategic direction as informed by the evolution of external factors like legal framework, socio-cultural features and trends, economic realities, technological development, environmental concerns promoting sustainable approaches to resources, and swift geo-political overturns.

A well-defined legal framework that clarifies the place and role of distance learning as not only an alternative to residential educational and training programs, but also a standalone solution integrated within the overall educational and training framework (i.e. undergraduate, graduate and postgraduate studies, as well professional development programs) is the stepping stone. Based on that, specific quality standards are required. They can be developed based on the features of specific sciences and related field of educational programs, and broken down by levels of educational programs (undergraduate, graduate, postgraduate) and by the ratio of teaching to practical/research activities. All of the above represent the basis for specific details such as the workload of educators/instructors, and the means by which that is best described: "contact hours", namely the time spent by the instructor in the synchronous mode or "level of effort", that is the amount of time needed to prepare for material delivery rather than the delivery itself. Credits are another important aspect to be acknowledged, legally speaking, since they play an important role in the opportunities that undergraduates and graduates are presented with in terms of study abroad or recognition of qualifications by international educational institutions.

Unfortunately, more often than not, the changes in the legal framework do not always keep the pace with the volatility of the other

factors that are external to organizational framework. Those either contribute to arguing the case of distance learning as an effective counterpart of full residential educational and training programs, or undermine it. For example, the socio-cultural features of a nation, the trends concerning employability, the brain drain that come along with economic realities represent important drivers when it comes to the choices that the people in the pool of potential participants in educational and training programs make. In this respect, unlike other major events impacting humanity in the past decade, Covid 19 pandemic has highlighted the digital divide between various walks of life from countries across the globe. According to the UN, educational inequality has been deepened by "digital learning" and great numbers of learners have been left behind as a result of lack or little access to digital tools. On the other hand, for the digital natives, Covid 19 has offered great opportunities in terms of full employment of existing competences just in time from any location. However, when describing economic realities in combination with geo-political factors, the ongoing war in Ukraine, as well as other emerging conflicts change the perspective as to the short-term and long-term priorities of people in relation to education and training.

Thus, legal framework, socio-cultural factors, economic issues, geo-political strife impact the medium to long-term planning of any educational entity in relation to integrating or not distance learning as a standalone solution for the delivery of educational programs. What is more, at the moment, it is pretty difficult for any organization – whether as an employer of DL graduates or deliverer of DL educational solutions – to evaluate the success of the impromptu DL solutions adopted during the pandemic for reliability reasons. Therefore, what we argue is that any decision to adopt distance learning depends on the results of reviewing the mission and vision of a given organization in relation to the impact of the external factors discussed above in terms of opportunities presented by the external environment, strengths acquired and weaknesses identified within the organization's competences, roles to be deployed and tasks to be fulfilled, information flows to be assured via chain of command, and technological solutions available or employed when adopting DL as an emergency solution.



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Furthermore, it is also important to mention the knowledge, technological, material capital already existing or gained and enhanced during the Covid 19 crisis. At the time, conducting distance learning alternatives for residential programs signalled the tight inter-dependencies among people's competences, the information flows generated by the specific roles and tasks undertaken by the latter and facilitated by the available technology. Furthermore, the temporary solutions identified to overcome bureaucratic processes of making decisions led to a decentralized approach that demonstrated the importance of allowing for agile approaches. Therefore, taking an organization's view on any decision concerning the adoption of DL standalone solutions requires an in-depth approach to the main components of the organization itself and their dependencies, namely organizational hierarchy, roles and tasks, technology that facilitates information flows, and people's competences. The roles and responsibilities inherent in the organization chart and the existing hierarchy, the tasks and processes derived from them, and the inherent flow of information they generate, the technology that facilitates the accomplishment of all of the above and the competences of people are all part of major organizational assets. Any change in one of the components generates ripple effects in the others. Adopting DL solutions requires not only better technological support, but also redefining the roles and tasks that are facilitated by technology or identifying new tasks derived from technology integration into organizational fabric. Furthermore, technology can be used effectively as long as people's competences and organizational decision-making and communication flows allow it. Hence, improvement in competences and re-engineering of organizational structures become a necessity.

In conclusion, distance learning can become a practical, workable and effective solution if a number of conditions are met organization wide from such a system's perspective. When an organization validates that distance learning is part of its mission and contributes to achieving envisaged outcomes and benefits, then features and requirements for DL educational and training solutions need to be identified. The system's approach to training is a time-tested process that not only enacts

the principles underpinning a system's approach to organizational mission and structure, but also sequences the steps needed to generate the features and requirements to which DL educational and training solutions need to align.

SYSTEMS APPROACH TO TRAINING

The Systems Approach to Training (SAT) is a widely acknowledged standard both in private organizations and public establishments across the globe. Its main benefit consists in linking on-the-job performance standards and subsequent tasks with the process by which an educational solution is identified/designed, developed/reconfigured, implemented/piloted and evaluated. In this respect, it is the essential communication bridge between employers, on the one hand, and providers of education and training, on the other hand. Thus, the adequate identification and description of needs and requirements in the field of human resource professional development can be better reflected in the design and development of educational solutions. Furthermore, SAT provides the necessary framework for conducting a cost-benefit analysis that validates or not the extent to which the educational solution proposed is affordable and sustainable.

There is a number of key concepts supporting the system's approach to training and informing what it takes to design curricula and courses in a process-based manner. The most important, from the perspective of the topic of the current article, is that of stakeholders. They provide a clear depiction of what needs are met by an educational solution and what the exact requirements are. In our opinion, the identification of the right stakeholders is based on three variables that depict their profile: power to set strategic direction, make decisions, set constraints such as time, budget, and features of the educational solution; urgency of requirement anchored in performance gaps substantiated by valid and reliable data or in the strategic outlook; and legitimacy to formulate requirements. Those three variables enable a realistic identification and portrayal of the target audience to benefit from the educational solution in terms of competences available and competences needed, number of people who need education or professional development, their geographical location, availability etc.



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The ADDIE (Analysis, Design, Development, Implementation, Evaluation) model, a key component of SAT, offers the other key concepts that need to be properly delineated and implemented in order to assure that the right solution is identified, while also undertaking the right process. Thus, the above-mentioned aspects of a curriculum and associated course/program are both standalone steps to be undertaken as well as parts of a logical process taking any educational initiative from inception to fruition. The most important questions that need to be asked as part of the aforementioned process, as well as the tangible outputs that need to be generated are presented below.

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The purpose of conducting the analysis phase is to generate a number of outputs, namely: job performance outcomes to be achieved via educational solutions; aim of educational solution/overall learning outcome; target audience profile (general characteristics); and instructional strategy (face to face/distance learning, solution life-cycle etc.). The questions to be asked in order to achieve the aforementioned results could be: *Who are the learners?; What do learners need to be able to do on the job?; What do learners already know?; What andragogical/pedagogical principles need to be made evident by the solution?; What other delivery modes/teaching strategies could be employed?; How much time do learners need to complete the course?; How much time is allocated for the educational solution?; What resources are needed by the learners to complete the course?*

Nonetheless, the major prerequisite for initiating this phase is to identify the stakeholders and their requirements. In this respect, a direct communication channel needs to be established between the employers who have knowledge of the performance standards to be achieved on the job, as well as the gaps that need to be bridged via education and training and the educational/training provider that has the necessary competences and technological and administrative infrastructure for designing, developing, and delivering an educational solution.

The design phase focuses on two aspects. First and foremost, it refines the target audience profile in terms of variables like geographical location, age, possible expectations/motivation level, necessary prerequisites for signing up on the educational solution,

likely constraints that could impede their participation in the course etc. Second, it breaks down the learning outcome that is derived from job performance standards into tasks, sub-tasks, knowledge and skills necessary for completing it. Based on that, further learning objectives are identified, as well associated assessment tools and instructional methods. All these aspects need to demonstrate alignment to the overall learning outcome and become assessment strategies and instructional strategies and their clear identification allows for establishing the solution requirements such as time needed to meet individual learning objectives and overall learning outcomes, references, and resources such as manpower, equipment, materials, constraints. The main questions that guide the design phase are: *Are instructional strategies/activities and assessment strategies aligned to the learning outcomes? Do they reflect the overall outcome of the educational solution?*

In the development phase, the following outputs are generated: instructional materials; assessment tools; schedule; professional development plan for instructors. In addition to them, it is essential to pilot the educational solution in order to identify and address possible gaps or problems. Additionally, the main tasks or processes needed to assure course administration support are also refined or developed. They concern course planning, preparation monitoring and close-out requirements. Thus, the main questions to be addressed are: *What other instructional activities/assessment tasks should be developed?; How long does it take/what does it take to develop/improve the instructors/teaching staff's competences?; What processes should there be in place to support the course from an administrative perspective (solution planning, preparation, delivery, closing)?*

The implementation of the educational/training solution is possible only if the measure of success is established from the very beginning. During this phase monitoring activities aimed at data generation, collection, analysis based on quality assessment framework are conducted. The main question driving all those is: *What requirements need to be met to successfully implement the solution?* In this respect we argue that the assessment framework needs to be designed and developed at the same pace with the solution itself and has to be



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anchored into stakeholders' requirements and in the institution's quality assurance framework.

Evaluation, while partially overlapping with the previous stages (i.e. any stage incurs validation of products via specific control tools aligned to the features of outputs), is a stage on its own, as well. Its main activities concern post-course review and institutional review. The former is based on internal data analysis and interpretation (data resulting from course assessment strategy and from quality assurance surveys focusing on instructors' competences, materials' relevance, administrative processes timeliness). The latter is based on external data (employers'/former graduates' self-reports/surveys/assessment) generation, collection, analysis and interpretation.

STUDENT CENTRED LEARNING AND BACKWARDS DESIGN

Student-based learning (SBL) is not a new concept. However, we strongly believe that nowadays it has been revitalized as a necessity by the swift advances in technology which make it difficult for instructors and well established educational and training institutions to keep pace and adapt on an ongoing basis. Therefore, the main goals and principles of SBL should underpin any effort to review existing curricula and educational and training programs or to follow the ADDIE to generate new educational solutions.

The simplest operational definition of SBL is that it is aimed at designing a system of learning that places the student at the centre of teacher's and institution's choices in relation to learning materials, assessment tools and evaluation, and educational environment.

The goals of employing this approach are two-fold: retention of meaningful knowledge and use of what is meaningful in new contexts. The principles underpinning the concept are not that new, being proposed initially by Carl Rogers (1965). According to Brandes and Ginnis (1986), there are a number of principles that require the teacher to reconsider the roles assumed in class and outside the class. Thus, during the learning process, students are empowered to take responsibility for their learning. That means the choices made in terms of instructional methods and assessment tools need to promote



active involvement and engagement, while the cognitive and affective domain become mutually reinforcing areas of learning. Consequently, the role of the instructor is that of a facilitator and resource person, while the relationships among students need to lead to growth and competency enhancement. Thus, the content of a specific discipline has to be wisely selected in order to consolidate knowledge, develop skills and self-awareness by targeted group/team work, allowing for time for reflection in class or outside the class, providing feedback and room for improvement, employing assessment rather than evaluation, using authentic assignments.

The stakeholders' perspective runs as a major theme through the concepts discussed previously (i.e. a system's approach to organization, SAT, ADDIE). We can assert then that it requires that education and training target authentic learning experiences. In this respect, it is worth underlining that every student has previous knowledge and skills, and those need to be unveiled, shared and employed in the learning environment. That means knowledge construction and skill development are enhanced by social interaction, resources external to the learning environment setup by the educational provide and inherent inputs, and by employment of cognitive, affective and physical processes (think-do-reflect) rather than by individual efforts or mere in-class interaction (Hoidn, 2017). Hence, a stakeholders' perspective underlines the importance of employing SBL principles.

In line with the need to enable students to become owners of the learning process, as well as taking into account the outcome-based approach on which the ADDIE model is built, we believe that another element contributing to solving the effectiveness dilemma of distance learning educational/training programs is backwards design and associated principles, tools and techniques. According to Wiggins, G. P., & McTighe, J. (2005), backwards design demands that any planning activity, be it in the field of curriculum or a given lesson, must clarify what the final result of the learning process needs to be. In other words, a clear statement of the learning outcome and associated objectives is fundamental. In this area, the clarity is rendered by the taxonomies employed in scaffolding the goals. One such tool is Bloom's revised taxonomy which covers in a sequenced

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manner cognition development from the lowest level to the highest level (i.e. remember, understand, apply, analyse, evaluate, create). Once the learning outcome is identified, acceptable evidence tools and techniques must be selected. In this respect, Wiggins and McTighe regard assessment as a continuum rather than a onetime event that “vary in scope (from simple to complex), time frame (from short-term to long-term), setting (from decontextualized to authentic contexts), and structure (from highly to nonstructured)”.

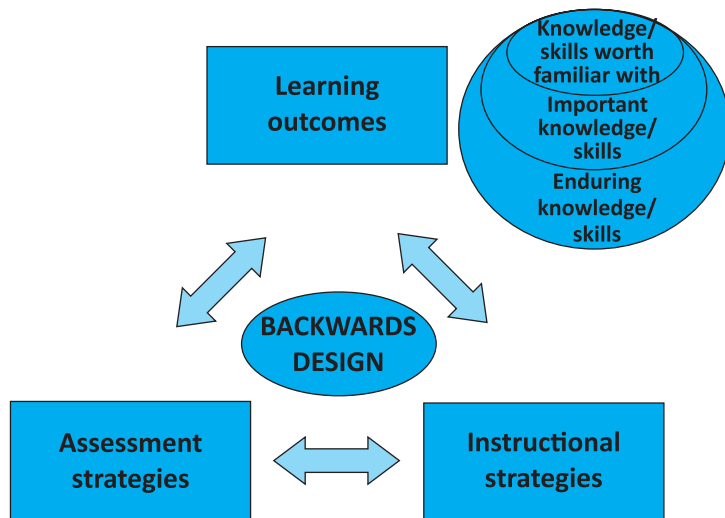


Figure 3: Backwards design

(Source: Wiggins, G. P., & McTighe, J. (2005). Understanding by design. Alexandria, VA: ASCD.; <https://educationaltechnology.net/wp-content/uploads/2016/01/backward-design.pdf>, retrieved on 23 September 2023)

TECHNOLOGY INTEGRATION IN DISTANCE LEARNING SOLUTIONS

An aspect that is essential in distance learning is technology integration. One model that is aimed at providing guidance on how to work with technology is proposed by Ruben Puentedura and focuses on four different levels of technology integration. Substitution, augmentation, modification and redefinition are the key words that drive the identification of where a lesson/curriculum/program is in this respect.

Substitution is about performing the same tasks of learning by using new technological tools. As its name says, what changes is the format



by which the task is undertaken, and no changes are made to the task itself. If, for example, we talk about the task of writing a paper, then substitution is made possible by the Microsoft Word suite. Augmentation maintains the task while increasing the learning opportunities. Thus, writing a paper is enhanced by the technology available in terms of opportunities presented by *speech to text/text to speech* applications, or checking/correcting typos via the *Spelling and Grammar* function. Modification incurs the use of technology in such a way that the lesson/curriculum/program is redesigned to allow for collaboration and higher order thinking skills like analysis and evaluation. In the case of our example, Google docs for peer/instructor feedback can be employed to allow for students to work together, own their learning and find new avenues for improvement. Worth mentioning is that the learning outcome remains the same, it is just the course of action that is different. In this respect, multimedia creation tools, collaboration tools allow for shared knowledge and joint knowledge construction, creating documents, videos, web pages. Redefinition in terms of technology integration involves conducting tasks that would be hard to achieve using traditional methods and generates leap in terms of enabling students to achieve learning outcome and even surpass it.

R	REDEFINITION creation of NEW TASKS PREVIOUSLY INCONCEIVABLE	TRANSFORMATION Technology as a partner
M	MODIFICATION SIGNIFICANT task redesign	
A	AUGMENTATION direct substitute, WITH FUNCTIONAL improvement in outcome or learning process	ENHANCEMENT Technology as a master
S	SUBSTITUTION direct substitute, NO FUNCTIONAL improvement in outcome or learning process	

Figure 4: The SAMR model

(Source: http://hippasus.com/rrpweblog/archives/2015/10/SAMR_ABriefIntro.pdf, adapted, retrieved on 22 September 2023)

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Substitution is about performing the same tasks of learning by using new technological tools. As its name says, what changes is the format by which the task is undertaken, and no changes are made to the task itself. If, for example, we talk about the task of writing a paper, then substitution is made possible by the Microsoft Word suite.



The model is not prescriptive and that is one of its main advantages. Furthermore, it contributes to better substantiated decisions concerning technology as an enabler of the learning process. Starting from the questions suggested by Puentedura and based on the authors' experience in designing, developing, conducting and evaluating distance learning courses, a number of questions can be employed to unveil the goals of technology integration as part of educational and learning solutions.

The question that Puentedura advises to employ when reflecting on technology integration is: "How to transition from traditional learning places to a continuum of learning spaces?". In this respect, it is noteworthy that technology as a substitution and augmentation tool is a master that dictates the accomplishment of tasks, whereas in the case of employing it for modification and redefinition purposes, it transforms itself into a partner and enables learning that would not be easily assured in its absence.

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Table 1: Questions for assessing the goals of technology integration

REDEFINITION	<p>What tasks are performed via technology integration that could not be done before?</p> <p>Do the tasks redefined by the technological opportunities foster participants' critical thinking, collaboration and creativity skills?</p> <p>Does technology integration encourage and allow the use of external sources of information/technology tools not provided on the course specifically?</p>
MODIFICATION	<p>Is the task (instructional/assessment) significantly redesigned?</p> <p>Do students become involved in using technology to visualize/explore during the learning process?</p> <p>Do they become content integrators and creators?</p> <p>Do they gain a personal stake in the process of learning?</p>

AUGMENTATION	<p>Can students interact with the content (i.e. instant feedback to quizzes, engaging)?</p> <p>OR What improvements are made/could be made to the tools employed at substitution level (power point, video, assessment tool, e-docs etc.) to better engage participants?</p>
SUBSTITUTION	<p>What does the course gain by replacing paper-based tools with technological solutions (i.e. videos, pdfs/electronic versions of documents, highlighted text, pictures etc.)?</p>

In relation to the effectiveness dilemma proposed by this article, we consider that the above questions are useful in order to better assess the goals of employing technological solutions and hence decide the benefits that they can generate compared to face-to-face solutions. In this respect, we argue that effectiveness is demonstrated by those DL solutions that aim at employing technology as a partner, and hence create collaboration spaces outside traditional classroom.

Choosing technology and integrating it as part of a continuum solution, as it is the case with distance learning programs or courses, should also take into account factors related to its functionality, suitability for active learning activities and accessibility. Thus, a number of questions need to be raised concerning the extent to which technology employed can be used by a great number of students while also allowing to create groups, its ease of use and the level of IT support needed to solve problems. Furthermore, technology should contribute to the learning process and not hinder it by focusing learners and instructors on technology use technicalities. Additionally, the distance learning solution should not overburden learners with the need to acquire state of the art equipment or software in order to assure compatibility and hence access to the DL solution. Offline access is another major concern that should be addressed in relation to technology integration, since one of the most common clichés associated with the choice of DL solutions is the promise of "anytime, anywhere" access.



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CONCLUSIONS

Making a substantiated decision on choosing distance learning as an effective counterpart of face to face educational and training programs depends first and foremost on a thorough scoping of the main socio-cultural, legal, economic and geo-political drivers outside any educational institution with a view to identifying the extent to which those factors impact in any way the demand for educational/training programs, be they face to face or in the distance learning format, and the formulation of the offer in line with the mission and vision of that specific entity.

Second, identification of clear-cut requirements based on a depiction of stakeholders' needs is another important step in establishing effectiveness criteria for distance learning solutions.

Third, it is of utmost importance that any distance learning solution should be anchored into the time-tested system's approach to training (SAT), namely identifying performance standards and performance gaps before actually starting the conduct of the ADDIE process.

Last but not the least, working with models or assessment frameworks that provide guiding questions for assessing the goals of technology integration into DL programs or courses is another major driver of effectiveness. Additionally, identifying specific functional, technical and pedagogical criteria supporting the choice of technological options is important for arguing the case of effectiveness of distance learning solutions.

In conclusion, the dilemma of the effectiveness of distance learning programs is complex and requires a multi-dimensional approach. This article provides an overview of the systemic, pedagogical and technological requirements for building and enhancing quality in distance learning educational/training/educational programs. Clearly, more detailed issues related to the criteria for shaping the virtual learning space in terms of the roles of educators/instructors and participants, principles, methods and techniques of interactive learning or formative assessment, principles for designing educational solutions, normative frameworks for quality assurance etc. should also be discussed to complete the solutions contributing to the effectiveness of distance learning solutions. All of those will be addressed in future research projects.

The dilemma of the effectiveness of distance learning programs is complex and requires a multi-dimensional approach. This article provides an overview of the systemic, pedagogical and technological requirements for building and enhancing quality in distance learning educational/training/educational programs.

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