R5.A2

Policy recommendations on the sustainability of cross-border virtual and blended programs

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Abstract:	**An analysis aiming to cover the policy dimensions of the virtual and blended modalities in higher education. This work entailed the elaboration of policy recommendations on the sustainability of blended teaching and learning programs.**
Keyword List:	**Institutional analysis, Virtual learning, Hybrid learning, Digital transformation, educational technology, Blended Learning.**

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Content

1. Introduction

As part of the result foreseen by the INVITE Erasmus + project, we propose to develop an evidence-based policy analysis aiming to cover the policy dimensions of virtual and blended modalities in higher education. This work entailed elaborating policy recommendations on the sustainability of blended teaching and learning programs.

Evidence-policy analysis is a method that involves systematically assessing the available evidence related to specific policy issues/proposals. It includes identifying relevant research, evaluating the quality and strength of the evidence, considering counterarguments, and making recommendations based on the analysis. Combined with the Scoping Review technique, it is possible to identify the breadth and depth of available evidence, including different study designs, methodologies, and sources of information.

This report presents the main concluding results, possible recommendations, and some pathways for digital transformation. Considering the limitations found in this study, we include a map showing the distribution of the evidence and the main gaps to help identify dimensions that require further development.

2. Pathways for Digital Transformation: Recommendations and Conclusions of the Policy-Evidence Analysis. Introduction

"When a complex system is far from equilibrium, small islands of coherence in a sea of chaos have the capacity to shift the entire system to a higher order."

Ilia Prigogine

The Policy Analysis on the evidence of virtual and blended learning in Higher education is based on an analysis of the interaction between the three dimensions considered in the Erasmus + INVITE project: new emerging technologies, innovation in teaching and learning, and the added value of the international dimension to academic programs.

Although scarce, the reviewed evidence shows some orientations to inspire policies and strategies for virtual and blended teaching and learning in Higher Education. The review of the evidence allows, firstly, to identify the factors that underlie and drive national and institutional policies, whose consideration is necessary when analyzing and anticipating emerging trends. Secondly, the analysis also allows the establishment of "maturity levels" that allow decision-makers to understand the state of development of the main dimensions of technology, pedagogical innovation and internationalization. This understanding is also helpful for national decision-makers or institutional leaders who wish to improve the performance of systems or institutions and who must decide what the priorities are, where to invest resources, what actions can be carried out, what skills need to be developed, what risks need to be anticipated.

We underline here some recommendations that might be helpful for policymakers and institutional leadership when designing and implementing their digital transformation plans:

- **Strategy development**: Digital modes of teaching and learning can solve problems higher education is facing today and will offer new opportunities for institutions. The first question an institution needs to address is the aim and purpose of embedding technology into its educational programs. Is it giving more access to new student populations? Is it improving the student experience? Is it differentiating itself from other competing H.E. Institutions? Is it to offset a demographic decline? Together with its aim, the strategy will be developed considering, as stated by McKinsey research (2023), considering six key dimensions:
    - What kind of scale is the institution looking to achieve? Are the new programs part of the institutional core programs?
    - Customization: What level of customization does the university/college want to achieve
    - Human resources: Does the institution have the necessary talent?
    - Delivery (Speed to market)
    - Regulation: Are there local legal constraints that could affect the program's design
    - Investment: What is the budget? Are there financial constraints?

- **Strategy deployment:** leaders must involve all the key stakeholders in the development and review of the policies (faculty, students, policy officers, etc.). The different roles assumed by leadership and the state of development of the strategies are both insights that reflect the maturity level of the institution and the kind of leadership required accordingly. (Handbook of Educational Reform Through Blended Learning, Ming Li, Xibin Han, and Jiangang Cheng, Singapore, Springer, 2023, XII, 418 pp. / Creating Mature Blended Education: The European Maturity Model Guidelines, Goeman, Katie; Dijkstra, Wiebe, Higher Education Studies; Vol. 12, No. 3; 2022).

- **Leadership and organizational culture:** Evidence shows that appointing leadership roles, such as Vice-rector of innovation, and fostering a mindset shift emphasizing an innovative culture of blended learning at the institutional level are good practices to promote institutional change.

- **Top-down and bottom-up strategies,** as shown in the evidence, have benefits and limitations. A combined approach seems to make the most of both methods. Ensure precise planning, goals, and support mechanisms while motivating teachers to explore and adopt blended teaching voluntarily, allowing them to leverage their intrinsic motivation while gradually expanding the implementation scope. The incentives, policies, and support mechanisms, such as capacity building for experimentation and the resources in place, are essential to change drivers. (Handbook of Educational Reform Through Blended Learning, Ming Li, Xibin Han, and Jiangang Cheng, Singapore, Springer, 2023, XII, 418 pp).

- **Teacher development and recognition**. This is probably the most stressed factor in Blended Teaching and Learning strategies and policies. Rewarding and formalizing the new competencies acquired by teachers in blended teaching and learning, as well as linking digital pedagogy academic staff development programs with career progression, helps to create a sustainable process.

- **Funding and innovation support**: Any strategy that is more than lip service requires resource allocation. Funding is an accelerator mechanism for blended and virtual education. To this aim, institutions establish innovation funds to support seed money, pilot projects, and scaling initiatives. Often, such efforts benefit from large-scale funding mechanisms created by national governments and agencies.

- **Blended learning implementation:** Institutions should focus more on the pedagogical process, the role of technologies, and their contextual application at the program and course level. Ensuring a combined process of face-to-face and online experiences with flexible pathways can help provide equitable experiences.

- **Technology and Infrastructure**: at the national level, it is essential to invest in robust technology to ensure equitable access to quality digital resources for all students (OCDE, 2023). At the institutional level, scalability, relevance, effectiveness, and user-friendly platforms are essential factors for the adoption of educational technologies. Encourage policy-evidence evaluation: at the most mature levels, institutions leverage data and research to evaluate blended learning strategies, ensuring alignment with institutional goals. (Digital Transformation in Higher Education: Regional Insights, Canada)

- **Quality assurance mechanisms:** Evidence shows the importance of embedding the QA process beyond national standards. Institutional frameworks inspired by international practices are means to ensure the most essential part of the process, the continuous improvement culture. The evidence provides various examples of frameworks and guidelines that could be helpful in inspiring similar processes at the institutional level.
  - Ensuring the ongoing evaluation and monitoring with teachers and students are good practices employed.
  - Prioritize Lifelong learning: expand blended learning to include upskilling and reskilling initiatives catering to the evolving needs of adult learners and professionals (the EU maturity model)
  - Internationalization: Internationalization strategies involve experimenting with Blended Intensive Programmes that provide practical ways to internationalize programs, taking advantage of short-mobility periods, to which European funds become helpful. Additionally, integrate international standards and facilitate international partnerships to exchange good practices and co-develop scalable models of blended learning. (OCDE, Maturity model, INVITE)

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A Map of evidence

As stated, the evidence is scarce, mainly in key issues such as the impact of technology-mediated activities on learning outcomes and the amounts of funding required for sustainable investment over time. Moreover, the resulting panorama is one in constant evolution, e.g. the availability and cost of emerging technologies (consider IA new applications).

Therefore, we decided to complement the evidence analysis with a map of evidence. An Evidence map is a systematic search of a broad field to identify gaps in knowledge and/or future research needs that presents results in a user-friendly format, often a visual figure or graph, or a searchable database. In the context of this policy review, it will be helpful to visualize where the evidence is concentrated and what areas further investigation would allow for a better understanding of the factors at play.
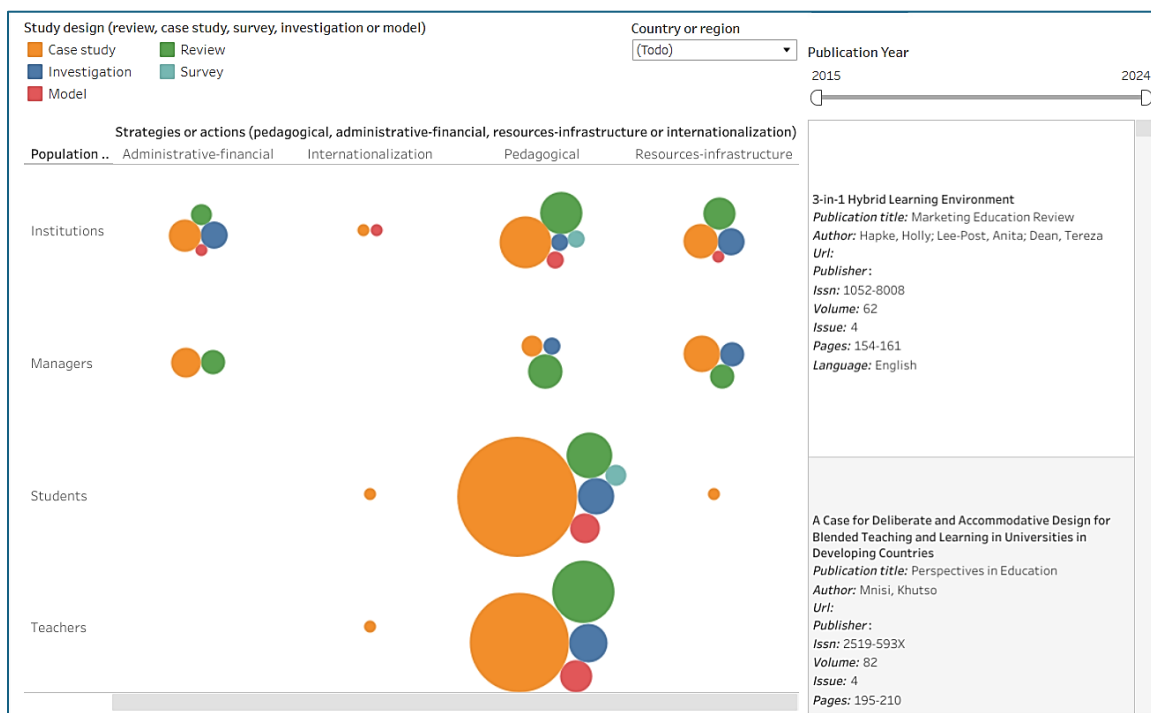
Full View at: https://public.tableau.com/app/profile/kelly.henao/viz/EGM_17325362425530/Dashboard1
See Annex - Bibliography Map

Towards a Dynamic modeling of the New educational landscape

The revised literature concentrates on the evidence in individualization of the factors that underly the expansion of virtual and blended. Some of them propose clues to understand the maturity levels of institutions in relation to virtual and blended learning. All these are valuable contributions, but from our point of view, they are not sufficient. When addressing the question "*How should blended learning be implemented within universities?"* some of the reviewed authors state that "*it is recognized that there is no single approach to blended learning."* Moreover, there is a desire from higher education institutions to seek a pathway that enables them to reshape their program and course design, transform teaching methods, and develop a blend that meets broader learning and teaching needs in the form of student access and tailored learning. A strategy that addresses the institutional perspective is required for implementation at a wide

scale; however, difficulties lie in how this finds its way down to the underpinning course-level pedagogy and teaching activities undertaken inside and outside of the classroom. In other words, although common themes have been identified in this review, it is also evident that there is no consistent approach to institutional implementation and the research surrounding it,

While recognizing the usefulness of the analytical approaches predominant in all the literature analyzed, these remarks indicate their limits. To analyze the complexity of the interaction between technology, educational models, and internationalization, it is necessary to resort to other, more dynamic conceptual models.

To complete the analysis of the factors and their elementary components that intervene in the development of these dimensions, we propose to understand them as components of a system defined by its overall purpose and the interactions between the parts that make up the whole. **Thinking about a system** consists of favoring the emergence of a whole where the parts can express their contribution to the service of a whole while preserving their individuality.

This conceptual approach allows us to place the purpose of a strategy at the heart of the system. At the same time, it will enable us to pay more attention to the interaction among the different factors since its complexity derives from such interaction. The properties of a system depend entirely on the relationship between the parts rather than on the nature of each of them. The meeting of different elements brings out new properties that were not contained in each of the elements considered in isolation. **The whole is more than the sum of its parts.** Variations result more from the combination and richness of the relationships between the elements than from the number of elements. Redundancy between individual experiences allows us to recognize paths. If redundancy were maximum, the systems would all be the same. If redundancy were zero, no structure or stable form could be recognized, and it would appear to be a pure product of chance. Between the two extremes, we can find a way to understand the functioning of the system, the principles of regulation and imbalance, and order and disorder.

A better understanding of the acting forces allows us to act more effectively in the system. We distinguish two types of forces materializing in the form of feedback loops:

- **Explosive:** a loop characterized by a positive feedback cycle that amplifies effects over time, often reaching a critical point or its collapse.
- **Stabilizing:** stabilizing loops are mechanisms that limit variations and return a system to equilibrium. They play a fundamental role in maintaining the stability of natural, artificial and social systems.

Identifying these loops within the system facilitates decision-making, allows one to project a system's dynamics into the future, and answers the question: What would happen if…?

To design the system and subsequently improve it, it is necessary to ask some key questions. For example,

- What are the main feedback loops that shape system behavior?
- How do these feedback loops interact with each other, potentially leading to delays, oscillations, or tipping points?
- What are the assumptions and mental models that underlie causal links and feedback loops?
- How sensitive is the system to changes in variables or parameters?
- Finally, what are the potential unintended consequences or side effects of intervening in the system?

Examining these questions can help provide a more complete analysis of Causal Loop Diagrams in the evolution of the new educational landscape.

Analysis of the different interactions in the light of the modeling of a dynamic system

We test the proposed causal analysis and present it in a separate document. We have chosen to focus our attention on what is most important to any higher education institution: the behavior of "traditional" students and "alternative" students, i.e., those who opt for new educational models with intensive use of technology. At the same time, we have focused attention on the segment of continuing education students and the segment of continuing education students who adopt new teaching-learning models with intensive use of technology. In this way, we have been able to focus our attention on different subsystems: student preferences, institutional policies, teacher inspiration, and brakes on change.

To illustrate the validity of this approach, let us refer to one of the mentioned subsystems, institutional strategies. A large part of the evidence analyzed in this report refers to how higher education institutions that want to achieve digital transformation must primarily promote the integration of digital technologies into higher education practices for learners and teachers.

Six key aspects of this implementation are:

- Digital learning technologies
- Teaching methods
- Personnel and support services
- Organizational policies and planning
- Training of administrative staff
- Development of partnerships

A positive/amplifying loop develops as investments increase to enable the implementation of "transformative" projects. Like training, it increases in strength when pressure on institutions increases. The more projects are carried out, the more the number of transformed establishments increases.

The following factors can explain the implementation delay:

- Some universities are very conservative, which slows down the decision-making process.
- Lack of staff resources: This shortage should be kept in mind, given the increasing pressure on universities to embark on hybrid delivery, which would likely involve more human and material resources and considerable investment in developing virtual learning environments and redesigning physical ones.
- Lack of recognition of good teaching; there is a predominance of recognition of research results rather than excellent education.
- Lack of training of trainers; no official/structured program for training HEI instructors.
- Infrastructure: high costs associated with acquisition/development
- ED-TECH companies often lack an understanding of user needs and innovations implemented in higher education.

Causal analysis aids in visualizing a system's structure and behavior and analyzing the system qualitatively. To perform a more detailed quantitative analysis, a causal loop diagram is transformed into a stock and flow diagram. A stock and flow model helps in studying and analyzing the system quantitatively. A stock is a term for any entity that accumulates or depletes over time, for example, a number of "traditional" students. A flow is the rate of change in a stock, for example, potential adopters of blended learning.

This policy analysis of the evidence for virtual and blended learning in higher education highlights the complex interplay between new emerging technologies, pedagogical innovation, and the international dimension of academic programs.

The evidence shows that, although scarce, some guidance can inspire policies and strategies for virtual and blended teaching and learning.

To improve the performance of education systems, policymakers need to understand the maturity levels of the main technological, pedagogical, and international dimensions. Recommendations include developing digital strategies, personalizing learning, investing in human and technological resources, and internationalizing programs.

In conclusion, a systemic approach is needed to understand and anticipate the complex interactions between the different drivers of digital transformation in higher education. Dynamic modelling will allow for the simulation of transformation scenarios, allowing for better planning and implementation of effective strategies to meet the evolving needs of learners and institutions.

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3. Annex - Bibliography – Map of Evidence

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