Optimizing hybrid learning for international accreditation in business master's programs – A comprehensive framework

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Abstract: Contributing to the dialogue on the future of higher education in the context of virtual learning, this paper proposes a comprehensive framework for optimizing hybrid learning spaces in business master's programs to meet international accreditation standards. The framework integrates three key components: AI-driven personalized learning paths, innovative assessment tools, and targeted teacher training, building on AACSB and EFMD standards and drawing on a systematic literature review. These elements are applied to physical, hybrid, and online modes of delivery, allowing for future scalability regardless of the position in the digital transformation spectrum of the study program or the institution. The framework, also considering its challenges, aims to enhance student engagement, develop critical thinking and problem-solving skills, and prepare graduates for leadership roles in the global business environment.

Keywords: Hybrid Learning Spaces, International Business Education, Accreditation Standards, Personalized Learning Paths, AI-driven education.

1. Introduction

In a world in flux, with more and more technology embedded in everyday activity, teaching methods similar to those from centuries ago cannot support students to have relevant skills and competencies. Universities are lagging behind technological advancements, and national and international regulations are even more laggard in terms of allowing for innovative pedagogical methods to be accepted. However, the international accreditation processes have been at the forefront of modernizing study programs and academia by changing the focus from the means for teaching to the pedagogy and content. Student active learning is one of the pillars of these standards, regardless of the institution issuing them, and it is just a modern way of displaying the millennia-old method of engaging the student. Although the nature of teaching has not changed, the spaces in which it is delivered have shifted and are currently affected by a new tide of artificial intelligence (AI). Following the COVID-19 pandemic lockdown period, which disrupted academic life by forcing it into an improvised digital landscape, the rapid adoption of AI and

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the increased usage of digital learning platforms put a harsh light on the vulnerabilities of the current model. These shortcomings are even more evident in the case of master's programs, in which students are already experienced, have a wider range of skills and abilities, as well as different levels of knowledge, and the program must deliver on the expected competencies in a shorter time frame. Alongside gamification and interactivity, virtual learning appears as a potential solution for this context; however, not all national jurisdictions allow for fully virtual programs, as is the case in Romania. Nonetheless, the Romanian master's programs are competing for students in a global environment, in which online masters are becoming more and more a go-to path. Thus, a solution for increased competitiveness for Romanian master's programs in a limiting national context is international accreditation, with an added layer of hybrid learning, blending virtual and digital with face-to-face delivery in a manner that is permitted by the national accreditation standards.

Fulfilling the standards of bodies such as the Association to Advance Collegiate Schools of Business (AACSB) and the European Foundation for Management Development (EFMD) becomes critical for the existence of the programs. Both bodies have set comprehensive standards covering various aspects of program delivery, meant to validate the quality of education and enhance global program recognition. Hybrid learning offers the flexibility of remote learning, a competitive factor for master's programs that have employed students, most in their mid-careers. It also preserves the benefits of in-person interaction, particularly the networking element, another competitive factor for graduate students. However, blending hybrid and virtual learning into master's programs presents unique challenges, particularly in meeting the stringent standards required for international accreditation, and for a Romanian master's program, even more so, considering the mismatch in national and international standards (see also Fleseriu et al., 2020).

In this context, the path toward achieving international accreditation for a Romanian master's program demands a comprehensive framework that effectively integrates phygital (physical and digital) components. This paper proposes such a smart and adaptable framework designed to optimize the use of education spaces while aligning the master's program with the rigorous AACSB and EFMD standards. The framework emphasizes continuous quality improvement and innovation, pillars of international standards, while mitigating the lags in teacher skills and pedagogies. It also addresses key areas, including institutional strategy, program design, delivery modes, assessment methods, and quality assurance processes on three different levels: physical, hybrid, and fully virtual / online. The main goal is to facilitate accreditation and, more importantly, to enhance the overall educational experience for students, preparing them for successful careers in an increasingly globalized business environment.

2. Hybrid learning in master's programs: A literature review on integrating AI, assessment, and faculty development

2.1 Hybrid education spaces

Also known as blended learning, hybrid learning merges the physical with the digital in phygital education spaces. Forced into the mainstream by the 2020 pandemic, it soon became evident that mixing virtual with physical in terms of education is not an easy task, albeit beneficial, and that more research is needed in this respect, particularly as it supports real active learning. This method has proven to be optimal for engaging students to think critically about concepts, processes, and phenomena, investigate them, and discuss them, as well as for supporting them in developing skills and abilities for decision-making, solving complex problems, and finding and explaining complex solutions. In a nutshell, active learning, through its various specific methods, including timely feedback, is considered a crucial element for a significant enhancement of the student learning experience. Both active and hybrid learning are essential for current master's programs; the latter with a significant positive effect on student outcomes as provides the needed student enhancement collaboration and learning outcomes, as well as flexibility and customization (Guerrero-Quiñonez et al., 2023) favored by non-traditional students, such as graduate students in the workforce pursuing a master's program (Hall & Mooney, 2010). The findings on the impact of hybrid learning did not change negatively in the past decade, with works throughout the period, such as Dziuban et al. (2018), underlining the evolution of blended learning and its impact on student success rates and satisfaction in higher education and also pointing the challenges in implementation, such as technological barriers and the need for redesigning curricula. This evolution, in both the adoption of hybrid learning and its consideration in accreditation criteria, led to a growing need to investigate and enhance the benefits while mitigating the vulnerabilities of the so-called hybrid education spaces.

Hybrid education spaces are defined as learning environments seamlessly integrating physical and virtual elements (Raes et al., 2020; Støckert et al., 2021) alongside pedagogies, flexible user-centered spatial design, and social interactions. These hybrid spaces are designed (Kohls et al., 2023) to fit better with active learning methods and strategies, as they are well-suited for student-centered approaches, particularly collaborative projects and real problem-solving. In literature, there are studies investigating pedagogical models, such as the HyFlex (O'Ceallaigh et al., 2023) that allows students to choose between in-person and online classes, blended synchronous learning and the flipped classroom approach, a method in which online resources are used as primary source for content and in-person classes are dedicated to collaborative exercises and active learning (Thai et al., 2017).

As is the case with general hybrid learning, the proper implementation of hybrid education spaces is also challenged by cognitive overload for both students and teachers, equity concerns, technical difficulties, as well as the overarching need for teacher training for this specific type of setting. Often, hybrid education spaces are criticized for limited impact (Imants et al., 2020). However, there are significant voices emphasizing the integration of online platforms and virtual tools to meet evolving educational demands (Papaioannou et al., 2023). Hybrid education is affected, as with all societal aspects, by the broad implementation of AI tools, with the potential for disruption due to the automatization of learning analytics, GenAI, and immersive technologies such as virtual and augmented reality, which may also enhance personalized learning alongside the teaching experience (Dawat, 2023). A main area for personalization comes from automated learner profiling, adaptive content recommendation, and real-time evaluation (Barrera Castro et al., 2024) meant for tailored content delivery and customized assessment – a line to be investigated in the next section on learning paths. Moreover, AI-enhanced hybrid education spaces may also support employability, a key accreditation area at both national and international levels for master's programs. They may use their design-centric approach, with an added layer of AI, mainly analytics, to provide personalized employability profiles, online self-reflection tools, and targeted workshops (Bennett et al., 2020).

Lastly, it is relevant to highlight that hybrid spaces are becoming increasingly important in meeting international accreditation standards, mainly for business master's programs. More and more accreditation bodies require evidence of effective and impactful virtual learning environments and activities promoting student engagement and achievement of learning outcomes. Thus, the desiderate of this article is to find a path forward in the optimal implementation of such a hybrid education space.

2.2 Accreditation aspects for hybrid education spaces - AI-enhanced learning paths, teacher training, assessment and learning outcomes and quality assurance

As previously mentioned, hybrid spaces fit with current international accreditation standards, as they provide enhanced and potentially equitable learning experiences. One way in which this experience may be delivered is through tailoring content and assessments to individual student learning styles and needs. This personalization may be achieved by providing students with learning paths and intelligent tutoring systems, and artificial intelligence significantly supports this development by providing customized real-time feedback and recommendations (Chen et al., 2020), meant to help students develop specific skills more effectively. One major downside to the usage of AI in education comes from ethical considerations, such as data privacy and algorithmic bias, or plagiarism concerns, mainly in graduation works such as dissertations (Intorsureanu et al., 2024).

Assessment and learning outcomes represent another pillar of international accreditation, as they are directly linked to assurance of learning (AoL) while also being critical for the success of hybrid learning environments. The integration of technology in assessment allows for diverse and innovative approaches to evaluating student performance (Guerrero-Quiñonez et al., 2023). Real-time learning analytics and data-driven assessment tools are linked to more timely interventions in case students do not develop the proper skills, while peer assessment and collaborative assessments link to a participatory type of practice.

Another crucial element in the proper deployment of hybrid education spaces is effective teacher training for this particular type of, as well as involving the faculty from a specific program in co-designing the hybrid space. Teacher training programs must emphasize the development of digital competencies and instructional design skills, and collaborative and community-based approaches (such as "study buddy" / mentor for technological concerns for faculty) have proven to be impactful. The international accreditation bodies acknowledge the pillar that is teacher training for providing high-quality content and developing adequate knowledge, skills, and competencies. Most accreditation standards mention the need for comprehensive and ongoing professional development programs for the faculty of specific study programs, including topics such as innovative pedagogies, virtual teaching tools, or artificial intelligence.

3. A comprehensive framework for optimizing hybrid learning spaces for international accreditation in a master's program

The structure of the comprehensive framework builds upon the work of Støckert et al. (2021), who emphasize a process of shift towards a student-centered approach in two of the largest technical universities in the Netherlands and Norway: Delft University of Technology (TU Delft) and Norwegian University of Science and Technology (NTNU). We propose, as Støckert et al. (2021), three layers: from Frontal Pedagogy (the traditional way of knowledge delivery) to Participatory Practice (in which students have a say in deciding their curriculum/topics and actively engage in developing their skills) and lastly, to Joint Problem Solving (in which "Student teams work entirely independently on not-yet-existing solutions" - Støckert et al. (2021)). All these levels are essential for a business master's program focused on developing competencies for managers in international organizations. From the international accreditation standards, we propose three pillar components: teacher training (TT), personalized learning paths (PLP), and assessment (AS). And for each of these, there are three sections: physical (P), hybrid (H), and online/virtual (O). We create, thus, a comprehensive framework with 27 actions and activities, as described in Table 1 and detailed in Tables 2 to 4. We focus the examples on an international business management program due to its clear eligibility for international accreditation (even more so

than other types of studies) and also due to the authors' experience in the field, with more than 20 years of teaching and strategic development of such a program (more details about it on www.mastermmib.ro).

The areas and tools to deploy and utilize for proper optimization of the usage of hybrid education spaces to fulfill the student-centric desiderates of the international standards for accreditation are as detailed in Table 2, followed by a deep focus on hybrid aspects (TT+PLP+AS), with added Quality Assurance (QA) elements, included separately in Tables 3 and 4.

Table 1. The comprehensive framework for optimizing hybrid learning spaces for international accreditation of a business management master's program

Component		Teacher training (TT)	Personalized learning paths (PLP)	Assessment (AS)
Frontal pedagogy (FP)		**P / H / O**	**P / H / O**	**P / H / O**
Participatory practice (PP)		**P / H / O**	**P / H / O**	**P / H / O**
Joint problem solving (JPS)		**P / H / O**	**P / H / O**	**P / H / O**

A separate but crucial element for international accreditation, flowing throughout the entire framework, is quality assurance, with specific actions for physical and online education spaces, such as:

- **Physical:** Monitoring in-person lecture quality, analyzing face-to-face student engagement data, ensuring consistent learning outcomes; Evaluating the effectiveness of physical group activities, analyzing collaboration quality, ensuring equitable participation opportunities; Assessing the quality of problem-solving experiences in physical domains, analyzing physical team dynamics, and ensuring consistent challenge levels.
- **Online:** Ensuring consistent online lecture quality, analyzing virtual student engagement, and maintaining outcome consistency across modalities; Assessing the effectiveness of virtual group activities, analyzing online collaboration quality, ensuring equitable virtual; Ensuring quality of virtual problem-solving experiences, analyzing virtual team dynamics, maintaining challenge level consistency.

Table 2. The comprehensive framework - frontal pedagogy, participatory practice, and joint problem-solving aspects for physical and online/ virtual

	Physical	**Online / Virtual**
Frontal Pedagogy (FP)		
Teacher Training (TT)	• Training on traditional lecture methods, use of projectors, and student response systems.	• Developing skills for delivering lectures entirely online, utilizing virtual response systems
Personalized Learning Paths (PLP)	• Offering face-to-face adaptive content and personalized lecture pacing	• Using analytics to personalize lecture pacing and providing tailored online resources
Assessment (AS)	• In-class tests, quizzes, and manual grading	• Implementing secure online exam proctoring, using online quizzes and automated grading
Participatory Practice (PP)		
Teacher Training (TT)	• Training in facilitating face-to-face group discussions and activities, developing interactive elements	• Designing interactive elements for virtual participatory practice, training in virtual group facilitation
Personalized Learning Paths (PLP)	• Offering personalized project assignments based on student preferences, forming flexible physical groups	• Supporting virtual project assignments, forming flexible online groups facilitation
Assessment (AS)	• Conducting peer assessments, utilizing physical portfolios to capture participatory activities	• Using e-portfolios for diverse activities, conducting online peer assessments
Joint Problem Solving (JPS)		
Teacher Training (TT)	• Training in guiding complex problem-solving in physical settings, developing scaffolding for independent learning	• Training in virtual problem-solving facilitation, designing scaffolding for virtual independent learning
Personalized Learning Paths (PLP)	• Offering personalized resources for physical project needs, allowing flexible physical team structures	• Offering choice in problem complexity and scope, supporting flexible online team structures
Assessment (AS)	• Implementing complex project assessments, conducting real-world case studies	• Implementing multi-faceted online evaluations, using adaptive assessments to match problem complexity

There are also some actions and activities that contribute to the framework on all levels (FP, PP, and JPS) and on all spaces (P, H, O), such as:

- Creating continuous learning opportunities in collaborative learning

spaces for teachers, with proper constructive feedback from peers and students;

- Providing the proper infrastructure for digital tools, with in-class accessibility (internet connection, wi-fi, computers, projectors, multimedia tools, etc.);
- Providing the proper feedback structure for students: summative, formative, peer assessments, and leveraging technology for data privacy;
- Conducting a regular review of practices and procedures with all relevant keyholders.

Table 3. The comprehensive framework - teacher training and quality assurance for hybrid

Component	Teacher training (TT)	Quality assurance (QA)
Frontal pedagogy (FP)	• Training in adapting lectures for both in-person and online delivery, managing cognitive load • Training on integrating physical and online teaching, use of blended learning technologies, strategies for maintaining student engagement • Include techniques for managing "attention equity"	• Monitoring quality across delivery modes, analyzing engagement data in different domains, ensuring consistent learning outcomes • Hybrid course evaluations, blended learning quality metrics, cross-modal feedback mechanisms.
Participatory practice (PP)	• Developing coaching skills for hybrid environments, facilitating mixed-mode group activities • Training on facilitating hybrid group work, use of collaborative tools (e.g., Google Workspace, Microsoft Teams), managing classroom dynamics in a hybrid setting.	• Evaluating group activities' effectiveness in hybrid settings (include AI-driven sentiment analysis), for assessing collaboration quality, ensuring equitable participation across modes • Hybrid quality assurance frameworks, integrated student feedback systems, multi-modal evaluation tools.
Joint problem solving (JPS)	• Training in facilitating hybrid problem-solving activities, supporting trans-disciplinary teams • Hybrid hackathons • Training on virtual collaboration platforms (e.g., Slack, Miro), techniques for	• Evaluating problem-solving experiences across domains, analyzing team dynamics in hybrid projects, ensuring challenge consistency • Hybrid project quality reviews, virtual and in-person feedback integration, blended learning

	guiding remote problem-solving sessions, hybrid project management.	outcome assessments. • A continuous improvement system that uses machine learning to analyze patterns in hybrid learning outcomes and suggest program enhancements

By extracting from the comprehensive framework, the aspects related to hybrid education spaces, we are left with a series of actions to be deployed for the duration of an academic year (assuming two semesters).

Table 4. The comprehensive framework personalized learning paths and assessment for hybrid

Component	**Personalized Learning Paths (PLP)**	**Assessment (AS)**
Frontal pedagogy (FP)	• Flexible attendance options (HyFlex), adaptive content delivery • Integration of AI-driven learning platforms, personalized learning analytics, hybrid adaptive assessments, "choose your own adventure" lectures	• Designing hybrid formative multi-modal assessments (e.g., online quizzes with instant feedback), automated grading**,** blended summative assessments.
Participatory practice (PP)	• Flexible participation modes, supporting hybrid group formation mode group activities • Hybrid personalized learning plan integration of digital portfolios, tailored group projects, hybrid mentorship	• Collaborative assessments workable in all domains, implementing peer assessment across teams • Hybrid peer review systems, digital group work evaluations, hybrid business simulations, mixed-mode formative feedback.
Joint problem solving (JPS)	• Personalized access to hybrid resources, supporting flexible hybrid team structures • AI-driven problem-solving tools, hybrid innovation labs, personaliz virtual simulations (e.g., AI "challenge matcher"	• Adaptive assessments for cross-domain projects • Hybrid case study assessments, virtual collaborative project evaluations, blended problem-solving exercises. • Hybrid capstone project, "global virtual boardroom"

This comprehensive framework for optimizing hybrid education spaces in an international business management master's program has a series of strengths:

- Firstly, its holistic approach encompasses teacher training, personalized learning paths, assessment strategies, and quality assurance across physical, hybrid, and online modes of delivery. The framework

considers all three modes, instead of just hybrid, for scalability and replicability, as each study program is placed at various stages in the spectrum of implementing technology;

- Secondly, its structure aligns well with international accreditation standards, particularly those of AACSB and EFMD, emphasizing innovation and continuous improvement;
- Thirdly, its focus on student-centered learning, progressing from frontal pedagogy to participatory practice and joint problem-solving, reflects modern trends in education and prepares students for the complex and volatile international business environments;
- Lastly, the integration of AI-driven tools and personalized learning analytics proves a forward-thinking approach to education meant to significantly enhance student engagement and learning outcomes.

However, it also has a series of challenges and vulnerabilities, mainly in terms of scalability and implementation, as institutional and organizational rigidity may hinder its full deployment. Also, regulatory concerns, as depicted in the Introduction, may also act as deterrents in the full hybridization of study programs in Romania. Another challenge may come from resource allocation, as an institution with scarce resources will focus first on survival and last on disruptive changes. Nonetheless, the mindset shift required by such an endeavor ensures long-term resilience. The effectiveness of the framework is yet to be proven in practice, with a one-year proposed deployment starting in October 2024 for the master's program in which it is piloted. Once the project is properly planned, it will have added performance metrics and quality assurance quantitative mechanisms to prove the correct impact of the framework. Lastly, although it mentions the idea of equity and inclusivity, the framework may benefit from a more detailed plan for mitigating polarization risks, considering the specificity of the master's program, with a global cohort of students and delivering global skills.

4. Conclusions and future directions

The comprehensive framework presented in this paper is designed to optimize hybrid learning spaces for international accreditation in business master's programs, addressing the challenges highlighted in the introduction. It blends physical and virtual elements and integrates AI-driven personalized learning paths, innovative assessment tools, and targeted teacher training across physical, hybrid, and online. All these elements are essential for a master's program in international business management in view of its potential accreditation. AI-driven learning paths offer the possibility of diverse skill sets required in international markets while catering to a diverse and global cohort of students. These students are also placed in the position to navigate complex global business challenges, so critical thinking, adaptability, and problem-solving abilities supported by innovative pedagogies are fundamental. These pedagogies cannot be deployed by untrained

faculty in unsuitable spaces; therefore, a complex shift in educational mindset is needed to properly benefit from international accreditation. This comprehensive approach aligns the study program not just with the standards but also with the evolving needs of multinational corporations, positioning students for leadership roles in an increasingly interconnected global economy.

Moreover, the framework aims to fit the study program with the necessary settings to meet the stringent standards set by international accreditation bodies such as AACSB and EFMD, aligning with the paper's emphasis on the importance of international accreditation for enhancing the global competitiveness of master's programs, particularly in the context of Romanian higher education.

The empirical validation of the proposed framework in the year following this paper through a pilot implementation in the master's in International Business Management allows for a more detailed view of its suitability and effectiveness, as well as potential scalability at organizational, national, and international levels.

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