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Hybrid Learning for Enhanced Acquisition of Transversal Competencies in Higher Education

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Abstract
Blended higher education involves both face-to-face and online learning, which implies the use of educational technologies in the teaching-learning process. It provides multiple advantages in terms of access to and appropriation of knowledge and the development of students' competencies. Educational technologies offer an environment and digital tools that enable the acquisition of disciplinary and transversal competencies to promote creativity and collaboration among students and facilitate access to the labor market. However, the acquisition of transversal competencies presupposes an adapted pedagogy to the specific needs of students. The aim of this quantitative study is to identify the relationship between university hybrid learning and the acquisition of transversal skills. A questionnaire reflecting learning practices was distributed to students at the Faculty of Education in Rabat, and a correlational analysis was carried out between the learning practices in hybrid courses and mastery of transversal competencies. The results revealed that hybrid learning optimizes the acquisition and development of transversal skills, and a positive and significant causal relationship exists between hybrid courses and mastery of these competencies. As a result, our work can contribute to innovate university teaching practices and optimize the educational system's performance.

Keywords: Hybrid learning, Learning practices, Educational technologies, Educational innovation, Transversal competencies

Introduction
Higher education in Morocco is undergoing a process of transformation, linked on the one hand to technological advances in the academic world, and on the other hand to the reform envisaged by official texts. In the second part of its report, the Special Commission on the Development Model (2021) highlights the importance of strengthening human capital through education and training, thereby stating the central role of knowledge as a factor in economic and social growth. In the digital era, higher education is undergoing changes that are altering its relationship with time and space, as well as its relationship with others. This certainly implies a renewal of skills and the introduction of new teaching methods such as learning by doing or design thinking, which is based essentially on appropriating and using technological tools and resources (Barabel and Meier, 2021). These active teaching methods place the learner at the heart of learning, which, according to Giordan (2016), is "a matter of interaction" between the learner's mental activities and their environment, following a system of thought based on their conceptions. Indeed, perceptions are changing due to the use of educational technologies involving digital environments and impacting the development of disciplinary and transversal competencies. Several studies and organizations around the world have noted employers' interest in mastering cross-disciplinary skills such as leadership, communication, collaborative work, analytical skills, creativity, change management, and adaptability. They are seen as essential for access to the labour market and guarantee professional and personal fulfilment that can lead to a successful professional career (Calero López and Rodriguez-López, 2020). Transversal competencies present a major challenge in terms of their acquisition and development, as they are very general, and their degree of mastery depends on the specific learning pathway of each learner.

The Brussels training reference framework (2013) defines transversal skills as professional skills, necessarily technical skills, required for the exercise of a profession. They require personal involvement on the part of the worker within a contractual framework and in a professional context. This professional aspect implies the need to build and develop these competencies through education and academic training in a formal way through internships and study diplomas (Gómez-Gasquet et al., 2018). Various international organizations have carried out many studies on the development and construction of transversal skills, recently referred to as 21st-century skills, emphasizing the emotional dimension and digital skills (Martínez-Bravo et al., 2022).

Recent studies suggest that face-to-face teaching is not conducive to the acquisition of cross-disciplinary skills by students, whereas hybrid training, which alternates face-to-face and distance learning courses, is beginning to gain ground, especially after the sudden change imposed by the COVID-19 health crisis, prompting us to ask the research question: Does hybrid university learning have an impact on the development of students' cross-disciplinary skills? We hypothesize that hybrid university learning promotes the development of transversal competencies. The aim of the study is to analyse the relationship between blended learning practices and degrees of mastery of transversal competencies, and to identify blended learning practices that promote the acquisition of these key skills through a quantitative study, thus contributing to the improvement of teaching practices in higher education and the construction of cross-curricular skills by students. Practitioners and researchers have been interested in the definition of competence, and it has not been possible to limit it to a single definition, given its complexity and the nature of its acquisition. Thus, according to Le Boterf (1994) "Competence does not reside in the resources (knowledge, skills, etc.) to be mobilized, but in the mobilization of these resources. Competence is a matter of 'knowing how to mobilize'". This definition is supplemented by that of Tardif (2006) as "A complex know-how-action based on the effective mobilization and combination of a variety of internal and external resources within a family of situations". In other words, it is "a combination of knowledge, know-how, experience, and behavior exercised in a specific context" (Zimmermann, 2000). Skills fall into two categories: disciplinary or specific skills and transversal or general skills.

According to Coulet (2016), transversal competencies are "very general competencies, which certainly need to be built up, but whose presence can be identified in each of the competencies used in professional and personal life", such as communication, analytical skills, creativity, teamwork. In defining hybrid systems, Peraya (1999) defines the term "system" as "a social place of interaction and cooperation with its own intentions, its own material and symbolic functioning, and its own modes of interaction". A system, therefore, combines, through a "structured organization, material, technological, symbolic, cognitive and relational resources". These can help to influence the behavior and social (affective and relational), cognitive, and communicative behaviors of subjects (ibid.). A system, at the time of its design and instantiation, therefore, creates the conditions for the emergence of some of these behaviors and behaviors which will, to varying degrees, be (re) actualized by the players as a function of their experience of it (Peeters and Charlier, 1999). The Anglo-Saxon literature defines courses based on the hybrid model as face-to-face courses that incorporate online resources and information to share content that is usually delivered face-to-face or to improve its accessibility. The face-to-face model then focuses more on the interactions between the learners (peers among themselves) and the teacher. The term blended refers to a harmonious and balanced mix of presence and distance supported using digital technologies and the network (Osguthorpe and Graham, 2003; Lim, 2002). From a more explicit and broader perspective: "Blend of learning approaches in their strategies to get the right content in the right format to the right people at the right time." (Singh, 2003). A blended learning course could therefore combine one or more dimensions: online/offline, individual/collaborative, formal/informal content, theory/practice, etc., thus enriching "traditional" training methods and offering reasonable value for money (Singh, 2003).

Osguthorpe and Graham (2003) include the following objectives in favor of the teacher setting up such

a system: access to resources, social interaction, self-directed learning, and ease of regulation. (Linder, 2017) insists that hybridization requires a pedagogical paradigm shift: «The transition to a hybrid classroom often necessitates a shift from teacher-centered to learner-centered methods and techniques ». The flipped classroom is a practical hybrid system that presents a working method to enable the development of disciplinary and transversal competencies liberating pedagogical creativity away from the "fossilization of practices" (Lebrun and Lecocq, 2015, p. 24) through the deployment of technologies and social networks. Thus, teachers can innovate their practices and motivate learners, making them more creative and autonomous in many activities and debates in the classroom, documentary research, projects, fieldwork, and work presentations.

Methods

The researchers developed a questionnaire covering students' learning practices in the context of blended learning, as well as their perception of their degree of mastery of transversal competencies, and administered it online to students in the Faculty of Education at Mohammed V University in Rabat. 154 students were solicited, and 90 responses were obtained with a return rate of 58.44%. The questionnaire includes 10 items that concern the identification of the respondents' profile (3 items: gender, field of study, level), the learning practices in hybrid learning (3 items: debates activities in the classroom; documentary research, projects, and fieldwork; work presentations) identified in our theoretical framework in order to experiment it in the Moroccan context, according to a binary scale with 2 modalities (yes – no) and finally (4 items) on the perception of students on their degrees of mastery of the four transversal competences verbal, written and public speaking communication; critical and analytical thinking; initiative, creation and adaptation to change; and collaborative work, conflict resolution and joint construction of knowledge according to a 6-modality Likert scale ranging from not at all mastered to very well mastered. We performed a statistical treatment of the collected data with SPSS version 26 to ensure the reliability and internal consistency of the data collection tool, and obtained a Cronbach's Alpha value of 0.826, which indicates a good internal consistency of our questionnaire.

Results

1. Frequency Analysis

1.1 Student Profile

The sample of students is composed of 70% women and 30% men. The average age of the students is 25 years, with a minimum of 18 years and a maximum of 50 years. 61.1% are between 18 and 25 years old.

1.2 Transversal skills

In this study, we have chosen to deal with four transversal skills: oral and written communication and public speaking; critical and analytical thinking, initiative, creation, and adaptation to change; and collaborative work. The results of the frequency analysis based on students' perceptions of their degrees of mastery at six modalities cluster as follows:

Oral, written communication, and public speaking

The results are illustrated in Fig. 1, with 56.7% of respondents reporting high levels of proficiency in oral, written communication and public speaking skills.

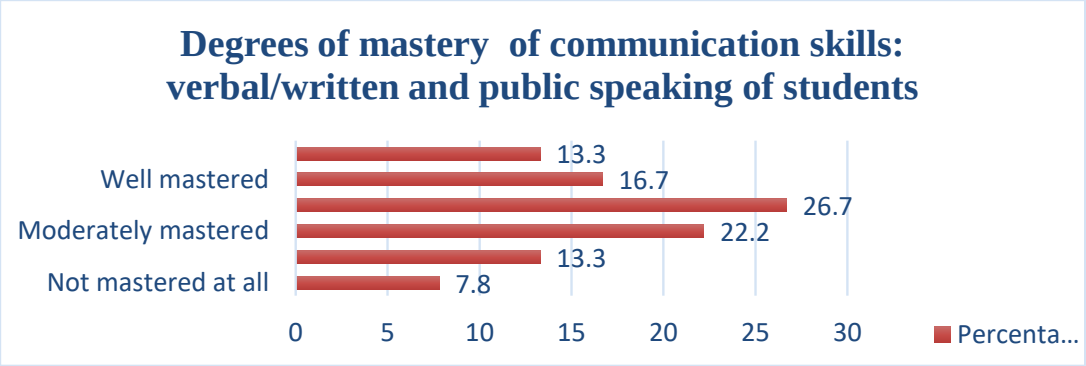

Figure 1: Degrees of mastery of communication skills: verbal/written and public speaking of students

Critical thinking and analytical skills

Figure 2 shows that 58.9% of respondents report high levels of mastery in critical thinking and analytical skills.

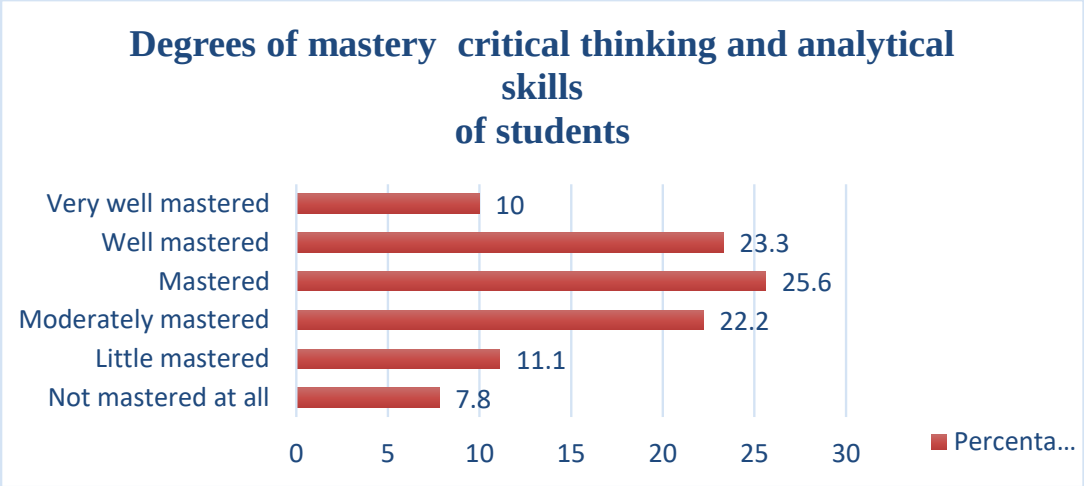

Figure 2: Degrees of mastery of critical thinking and analytical skills of students

Initiative, creation, and change management

66.7% of respondents report high levels of mastery of initiative, creation, and change management skills, the results of which are illustrated in Fig. 3.

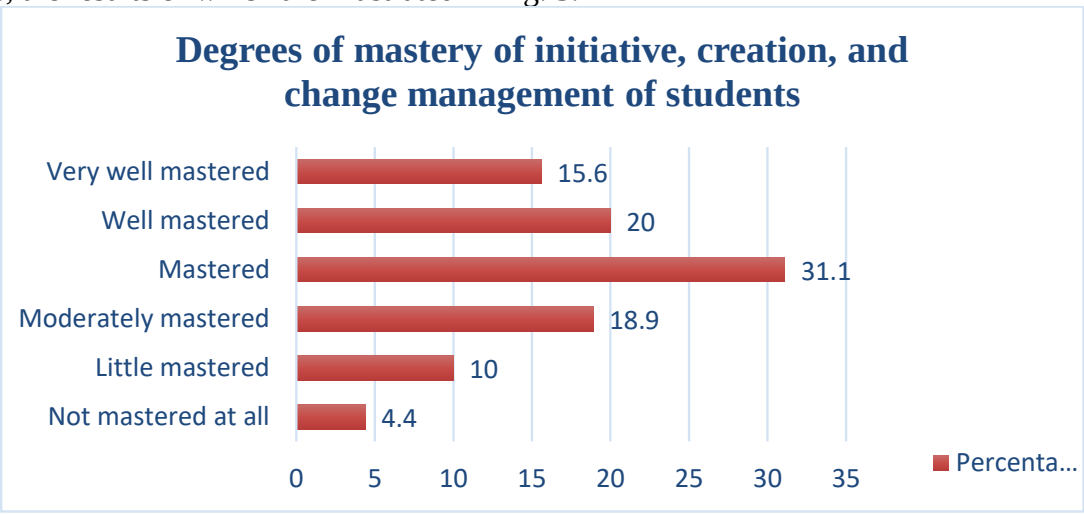

Figure 3: Degrees of mastery of initiative, creation, and change management of students

Collaborative work (in groups), conflict resolution, joint construction of knowledge

Figure 4 reveals that 65.6% of the respondents claim to have a high mastery of collaborative work (in groups), conflict resolution, and joint construction of knowledge, thus showing the highest percentage of mastery.

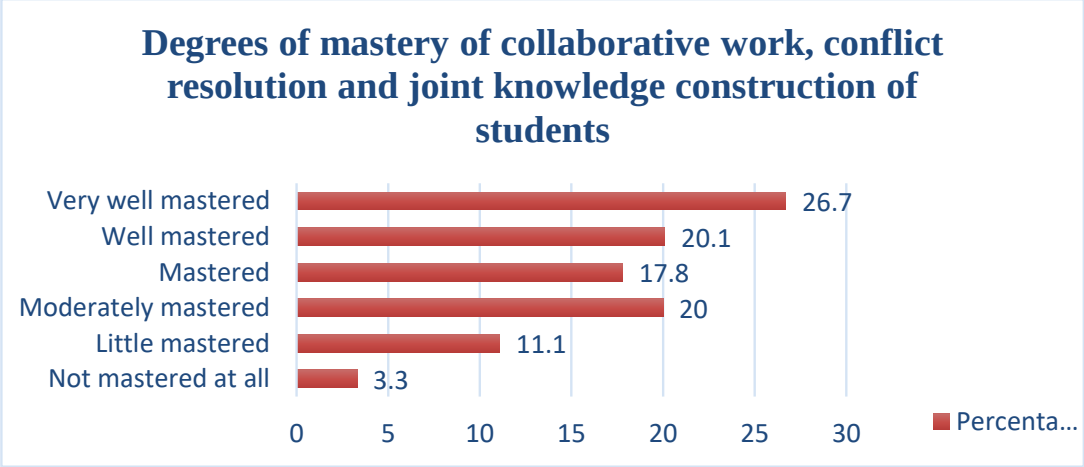

Figure 4: Degrees of mastery of Collaborative work (in groups), conflict resolution, joint construction of knowledge of students

1.3 Learning practices in hybrid courses

Figure 5 shows the percentages of students' learning practices in hybrid courses. 49.1% of them make work presentations, 25.9% take part in debate activities in the classroom, and 25% realize documentary research, projects, and fieldwork.

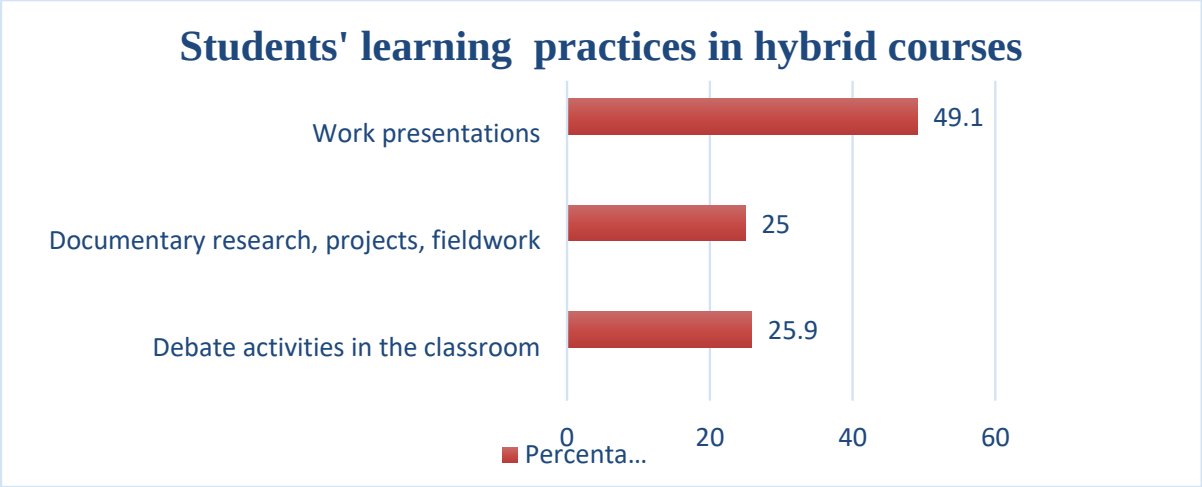

Figure 5: students' learning practices in hybrid courses

2. Analysis of correlations

A correlational analysis was performed between the three learning practices and the four cross-cutting competencies retained by the study to confirm or refute the previously mentioned hypothesis. Since the questionnaire includes ordinal qualitative variables that are measured by two scales: The binary scale to assess university hybrid learning practices perceived by students, as well as the Likert scale to assess students' perception of their degrees of mastery of transversal competencies, the researchers calculated Kendall's Tau-B correlation coefficient that measures the association between the variables and allows them to perform the significance test to test the null

hypothesis that assumes no association relationship between the pairs of variables tested. The results are presented in Table 1.

Table 1: Bivariate correlation of perceived mastery of transversal competencies and hybrid learning practices

			Communication: verbal/written - public speaking	**Critical thinking: feedback (reflection on your actions) and analytical thinking**	**Initiative, creation, and change management**	**Collaborative work (in groups), conflict resolution, joint construction of knowledge**
Kendall's Tau-B	**Debate activities in the classroom**	Correlation coefficient	0,230*	0,221*	0,297**	0,179
		Sig. (Bilateral)	0,014	0,020	0,002	0,059
		N	**90**	**90**	**90**	**90**
	Documentary research, projects, fieldwork	Correlation coefficient (Bilateral)	0,147	0,149	0,153	0,209*
		Sig. (Bilatérale)	0,118	0,115	0,107	0,027
		N	**90**	**90**	**90**	**90**
	Work presentations	Correlation coefficient	0,088	0, 113	0,179	0,246**
		Sig. (Bilateral)	0,349	0,233	0,059	0,009
		N	**90**	**90**	**90**	**90**

*Correlation is significant at the 0.05 level (two-tailed).
** Correlation is highly significant at the 0.01 level (two-tailed).

Therefore, we find significant and highly significant correlations between the three components of learning practices and the four transversal competencies, stating a correlation and an association relationship between these variables. Thus for:

Debate Activities in the Classroom:
Verbal/written communication and public speaking have an almost positive association relationship and significant correlation with a correlation coefficient (r=0.230) with debate activities in the classroom. For critical thinking and analytical thinking, we find a weak positive association and significant correlation relationship: the correlation coefficient has an R-value of 0.221. For initiative, creation, and management of change (r = 0.297) which attest to a highly significant correlation. The results reveal no correlation (r = 0.179; p-value >0.05) between collaborative work in groups, conflict resolution, and joint construction of knowledge and debate activities in the classroom.

Documentary research, projects, and fieldwork:
Verbal/written communication and public speaking; critical thinking and analytical thinking initiative, creation; and change management don't have a positive association relationship and correlation with documentary research, projects, and fieldwork (p-value>0.05). The results of collaborative work (in groups), conflict resolution, and joint construction of knowledge reveal a positive association and a significant correlation (r =0.209).

Work Presentations:
Verbal/written communication and public speaking; critical thinking and analytical thinking initiative, creation; and change management don't have a positive association relationship and correlation with work

presentations (p-value>0.05). The results of collaborative work (in groups), conflict resolution, and joint construction of knowledge reveal a positive association and highly significant correlation (r =0.246).

Discussion

The results reveal that the transversal competencies studied allow us to note the positive impact of university learning practices on acquiring and developing key competencies. The main learning practice is the presentation of work, which may explain the use of a learner-centered paradigm rather than teacher-centered teaching (Linder, 2017). In a hybrid environment, oral and written communication and public speaking can be solicited through classroom debates, and it can also encourage documentary research using technological tools. Hybrid learning generates interaction, collaborative activities, and communication as stated in the literature (Peraya, 1999), and promotes critical thinking as well as the spirit of initiative and creation. According to the correlational analysis, debating can develop the three transversal competencies cited above. Collaborative work makes it possible to carry out field research and projects and present work. The correlation thus underlines more precisely the transversal competence and the learning practices that enable it to be acquired or built. Depending on the nature of the skill and the context in which it is to be used, know-how and interpersonal skills can form the core of cross-disciplinary skills. They are general and common to several disciplines. Each cross-disciplinary skill must be mobilized in a pedagogical situation during the learning process thus enhancing the acquisition of transversal competencies in an academic context (Gómez-Gasquet et al., 2018), however complex it may be. We thus obtain a differentiation and distinction between competencies and students' work methods, which teachers can consider when designing courses and assessing them. Indeed, the planning phase identifies and specifies the disciplinary competencies targeted by the modules taught and must also target cross-curricular competencies often neglected in the learning and assessment process, as well as remediation and self-regulation. The research reveals original results that can contribute to the innovation of teaching-learning processes and the acquisition and construction of cross-disciplinary skills that are in high demand on the job market and enable better professional integration.

Therefore, as stated in the literature review, active pedagogies put the learner in situations of mobilization of competencies that promote the development and mastery of transversal competencies through experiences (Coulet, 2016).

Conclusion

Transversal competencies are essential for better integration into the job market and are highly sought-after by recruiters. These skills can be developed through education and training, precisely in a university context. Indeed, the results of our research show that hybrid university learning encourages the development of cross-disciplinary skills since they are called upon and mobilized during learning assisted by new technologies, which is perfectly in line with the literature consulted. Learning practices based on active pedagogies lead to active involvement in hybrid courses, as well as the mobilization of learners' technological skills such as information retrieval, the use of digital tools or supports like platforms or applications, which promotes self-learning and autonomy, communication, creativity...etc. In fact, it's a vast range of generic or transversal skills that can be the object of construction, learning, and assessment. In this way, our research can contribute to improving teaching practices and students' mastery of transversal skills, guaranteeing high-impact pedagogical innovation. The Researchers recommend the mobilization of digital skills in hybrid courses to facilitate the acquisition and development of transversal competencies.

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