

EXPLORING LEARNING EXPERIENCES OF UNIVERSITY STUDENTS DURING THE PANDEMIC, A STARTING POINT FOR FUTURE QUALITATIVE IMPROVEMENTS - AN EMPIRICAL STUDY ABOUT POST-PANDEMIC LEARNING ANALYTICS*

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Abstract

The Pandemic period determined an abrupt transition of education systems, including tertiary education, from the traditional "face-to-face" learning environment to alternative ones in the online space, which had significant consequences on the teachers' didactic roles and especially on the quality of student learning, due to them being placed under the conditions of the absence of a transitional period with a formative effect. The article aims to identify the students' perceptions regarding the favorable elements of learning in the digital realm in comparison to the "face-to-face" environment, having as a purpose the improvement of the quality of university studies in the post-pandemic period. The empirical research used in the study involved undergraduate students from the Faculty of Sociology and Social Work (University of Bucharest), being based on the comparative approach of learning analytics elements in order to highlight the differentiated effects caused by online learning versus the face to face one.

Analyzing the changes felt by students in the post-pandemic period at the university education level regarding the efficiency of the organizational efforts when it comes to the learning process in the academic space, led to drawing interesting conclusions concerning: the need to expand the usage of blended learning forms, recommendations that can be useful for the teaching staff regarding the stimulation of the students' learning and the utility of involving a new type of specialist within the university, the one of a learning process analyst that sustains direct forms of mediate learning and learning support, offered especially for undergraduate students.

Key words: *Monitoring the learning process; Learning analytics; Blended learning; Post-pandemic mediated learning; Learning process analyst.*

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1. Contextual background

The pandemic period determined not only a sudden change in the organization and design of learning processes addressed to students in higher education (HE), but also a special interest from researchers who addressed in a significant number of scientific materials the analysis of multiple aspects intended to lead to the identification of positive or negative consequences on the quality of learning determined by online environments for carrying out educational activities.

Therefore, a survey of the academic and research media reveals a consistent number of studies on this topic that demonstrate their utility, including in the post-pandemic present, when research concerns goes forward, to comparative approaches with the aim of setting factors of improvement of the quality of learning that takes into account the combined capitalization, both of the positive aspects from the period of the majority use of online environments, as well as of the favorable and characteristic elements of "face-to-face" learning environments.

As a result of the analysis of the specialized literature, we retain some useful premises that we propose to use in this study:

- Since the transition from face-to-face learning to exclusively online learning was sudden, during the pandemic, students had to suddenly practice new ways of organizing learning without prior accommodation with hybrid formulas /blended type or "learning aids of worked examples and hints types in a blended curriculum, combining problem-based learning with e-tutorials" (Tempelaar, 2022, p. 131). We can also consider that the reverse transition from online to "face-to-face" learning environments in the post-pandemic period was achieved in a relatively similar way, without a period of parallel use of the two types of learning environments, which would have allowed a balanced takeover of effective practices, an analysis of the positive aspects related to each one of them and a continuation of the combined use of some learning modes.

- Given the major challenges caused by the need to provide university education exclusively in online environments during the pandemic period, a consistent number of studies provided by specialists have tried to clarify learning factors stimulated by online environments, as well as disadvantages, in comparison with „face to face" learning environments, with the stated intention of supporting with recommendations the improvement of student learning outcomes. Therefore, significant data sources can be identified for the construction of a learning analytics for the pandemic period that can be used, through analogical and comparative approaches, as a starting point for a learning analytics applicable to the post-pandemic period.

- In comparison with the "face-to-face" learning, academic learning in online environments requires much more consistent self-organization skills and student dispositions to learn (Learning dispositions represent individual differences that affect all learning processes and include affective, behavioral and cognitive facets (Rienties, Cross, & Zdrahal, 2017, in (6), p. 132). As a result, in technology-based learning environments "self-regulated learning is facilitated by the availability of instructional scaffolding" (Tempelaar, 2022, p. 132).

- Another element investigated, related to the specifics of student learning during the pandemic period, considered the best practices of teachers on how to ensure monitoring and provide adequate support to students in the context of online education. The analyzed studies most often lead to the conclusion that: "From the earliest studies appearing about the pandemic, one of the challenges teachers report is that it is hard for them to monitor their students, harder than it was in the physical context" (Van der Spoel *et al.*, 2020 in (7), 2023, p. 1).

- However, although social networking sites have been found to serve as effective mediators in collaborative learning, enhancing students' engagement, creative thinking and interpersonal skills (Binesh *et al.*, 2018), other studies suggest that the exclusive use of online media of learning during the pandemic period led to the impact of students' well-being, anxiety and inefficiency of the results obtained within the learning processes.

It should also be mentioned that, for the theoretical background of this study, we oriented the preliminary information to studies and articles that considered, for the pandemic period, the analysis of students' perceptions regarding learning factors that were favored or not by the online organization of learning, but also direct contributions of teaching staff regarding student learning monitoring practices, providing learning support, including through mediated learning.

2. The present study

The theoretical construction of this study started by identifying and selecting some factors that significantly influenced student learning, as well as some factors for monitoring/stimulating academic learning by teachers during the pandemic period, identified through desk research, based on the frequency of occurrence in academic analyzes in the field published in the period 2020 – 2022.

The questions we tried to answer to in this study are related to the following aspects: what are the students' perceptions about expressing a preference in order to learn more effectively in online or "face-to-face" environments and did the students feel supported by teachers for more efficient learning, in online or "face to face" environments. The expected answers tracked student expressions of opinion, distinctly, for the context of exclusively online learning environments (pandemic period) versus the current context, in which "face-to-face" learning environments have become predominant again from the perspective of everyday use in universities.

Starting from the comparative analysis of the intensity of the students' answer choices for the factors/elements of learning analytics in the pandemic/post-pandemic periods, the study aims to also clarify to what extent the combined forms of organizing academic learning in the post-pandemic period can constitute fruitful solutions that bring added value to the quality of learning processes during the pandemic period, through interdependencies with the positive aspects derived from the "face to face" development of university education today.

In this context, we aimed to identify the students' opinions regarding the opportunity of a new type of specialist, the "learning process analyst" who could

directly support forms of mediated learning and support in learning, granted especially for undergraduate students.

3. Research Methodology

Considering that most studies approached relatively distinctly, either the analysis of the students' or the teachers' perceptions, about factors influencing learning in a pandemic context, in the proposed study we tried to capture, in a comparative manner (the pandemic period/ post-pandemic), conclusions of a learning analysis based on students' perceptions, both about the quality of personal learning and about the involvement of teaching staff in measures to monitor academic learning.

To obtain some relevant conclusions in relation to the proposed objectives, we used empirical research to investigate the opinions of the students. This was achieved by means of a questionnaire constructed especially in order to obtain answers starting from the initially established premises.

The questionnaire included 10 questions, which, beyond the intended introductory aspects (questions 1-4), have a content that requires: answers from multiple predefined options (questions 6 and 9); answers based on the construction of hierarchies of personal choices in an implicit comparative manner (questions 5 and 7); open answers, formulating reasoned opinions (question 8) or personal recommendations on the given topic (question 10). Although the number of questions was relatively limited, the predominantly qualitative character of the answers requested determined an average time to complete the answers of 30 minutes.

The first 4 questions of the questionnaire (especially questions 2 - 4) asked for answers with introductory value in relation to: the existence of an experience related to the use of online learning before the pandemic period (being asked for a dichotomous answer), the mention, with approximation, of the duration (in years) of education in online environments during the pandemic period and with the percentage estimate of the weight of learning experiences carried out online during university studies, from the total time allocated to teaching activities.

Two of the questions (questions 6 and 9) contained multiple and single-choice answers, with the possibility of completing with additional answers provided by students (question 9). These inquiries sought, in the case of question 6, the identification of some elements that affected the quality of student learning during the pandemic period that were solutionized in the post-pandemic period, no longer being an impediment to learning. In the case of question 9, the respondents had to choose (through multiple-choice answer) from several options, recommendation proposals for continuing to support learning in online environments, based on the lessons learned during the pandemic period.

Questions 5 and 7 sought answers ranked individually by respondents, in a distinct manner (for online/face-to-face environments), regarding preferred reference elements for learning approaches in academic environments (question 5), respectively the expression of opinions regarding factors for monitoring student

learning used by teachers, especially in online environments, respectively in "face-to-face" education environments (question 7).

The questionnaire also included 3 open-ended questions that aimed to express opinions/recommendations on: the appropriation of the need to provide *learning support for students* through a learning process analyst, as a specialist in the university that helps train effective learning skills in students or possibilities for teachers to improve students' learning experiences in the post-pandemic period, based on lessons learned during the pandemic period, respectively adding other useful information that respondents would like to add in relation to the survey.

By means of the 10 questions, the questionnaire proposed to the students sought to probe opinions regarding the specificity and consequences felt by them in relation to the past learning pandemic, but also points of view regarding the way in which university learning today is influenced by the recent past, from the perspective of possibilities for future improvement of the quality of learning.

The data collection consisted in the application of the questionnaire built for students in October 2023, under conditions of ensuring the anonymity of the identity of the participants. Students from the 2nd year of undergraduate studies at the Faculty of Sociology and Social Work, majoring in Social Work, from the University of Bucharest, were involved in this data collection effort. 25.78% of the total number of students enrolled in the 2nd year of studies in the Social Assistance specialization participated with answers, as many explained that they were overloaded with activities and individual projects.

4. Results

The answers obtained from the students were consistent and of high interpretation value, the first premise in this sense being provided by the fact that 51% of them already had experience related to the use of online learning before the pandemic period. Therefore, the duration of the studies conducted in the online environment during the pandemic period becomes relevant for the study so that, based on sufficient experience, the respondents can operate in a credible and realistic manner with the analysis of some aspects of learning, in a comparative manner, when it comes to online versus "face to face" education.

At the same time, we can assume that 48.97% of the respondents went through a tougher period from the perspective of adapting to exclusively online learning environments, as there is the possibility that the comparative answers provided are relatively balanced from the perspective of the positive contributions brought by the 2 learning environments online/face-to-face quality of student learning for the post-pandemic period, given a significant amount of time already spent in online education environments even before the pandemic.

To the percentage mentioned, that represents the pre pandemic period of familiarization with the online learning environment, there is to be added an approx. 2 year period of online learning in the pandemic for the students questioned, an information that was derived from the 81, 63% of answers to the second question.

In minority proportions, 10.2% of the respondents went through 3 years of online education experience during the pandemic, 8.16% having such an experience of only one year.

Regarding the amount of learning experiences carried out online during university studies, from the total time allocated to teaching activities, the students' answers were extremely granular as a percentage expression, which determined the need for their grouping. This resulted in a predominance for the 10-50% range expressed by an average percentage of 68.29%, while for the 51-100% segment the preferences were oriented towards a percentage of 31.7%. From these percentage expressions, we can appreciate that the majority returned to "face-to-face" activities in the post-pandemic period, in the case of the respondents.

Continuing the expression of weights associated with online/"face-to-face" learning experiences, through question 5 we aimed to express students' preferences regarding relevant, predefined elements associated with learning approaches organized in online or "face-to-face" academic environments. With the title of general appreciation regarding the answers received, there is a noticeable degree of intensity in the expressed opinions on the 1 to maximum 6/7 scale, which can point to their strongly individualized character, but also to a reduced focus level of these group-level opinions (although the respondents came from a homogeneous group of students from the same study specialization).

A similar level of favorable appreciation, both for the online and the "face-to-face" environments, was obtained in the case of the reference elements regarding: the transmission of systematic contents related to the course hours, the expression of points of view, of personal opinions in the relationship with those transmitted and the organization and development of evaluation situations (within the seminars/final evaluation). Although a similar level of favorable appreciation was also associated with the element of analysis, *organizing and conducting assessment situations (within seminars/final assessment)*, a significant number of choices for the least preferred option is also observed, both for online environments, as well as for "face to face" environments. A possible interpretation of these situations may indicate that some of the students clearly/exclusively prefer the association of evaluative approaches with one or another of the compared educational environments.

A clearer differentiation of the expression of the answers from the perspective of the intensity of preferences is visible for the "face to face" environments in the case of the following reference elements used in the questionnaire: the transmission of systematic contents related to the course hours; explanations for understanding contents, concepts, relationships, etc.; solving problems in collaborative group work. However, even in the case of these reference elements, there are respondents who marked their preferences for online environments.

In the case of the analysis element *solving problems in collaborative group work*, a significant number of choices for the least preferred option for online environments compared to "face-to-face" environments is noted.

Following the expression of students' preferences in relation to elements of online/"face to face" learning analysis, question 6 of the questionnaire has a role of verifying the answers expressed for question 5.

Through question 6, the students were questioned about several elements that affected the quality of their learning experience during the pandemic period, identified in specialized studies in the preliminary stage of theoretical analysis carried out for this material. The directly pursued objective was to indicate, from several possible options, those elements that the respondents consider to have found solutions to in the post-pandemic period, and that no longer represent an impediment to learning.

The possibility of multiple choices determined the gathering of less differentiated intensity weights between the possible answer variants, but the more consistently operated choices determined a greater credibility in relation to the respondents' opinions. Therefore, 42.85% of the surveyed students considered that the limited discussions and debates with professors and/or colleagues during the pandemic period constituted the most targeted aspect for resolution in the post-pandemic period, compared to the previous period. The answers that followed, with lower percentage values, close in value, were related to: decreased motivation/involvement in solving learning tasks (26.53%), to the low level of teachers' appreciation for works done/presented by students (22.44 %), as well as the assessment of the interactions with educational purposes were addressed, according to the opinion of 18,36% of the respondents.

One can observe that although the interactions with learning goals were rated as relatively functional even in online-only learning environments during the pandemic period, actual debates and discussions with teachers and/or peers were less likely to be effective until the return to face-to-face learning environments.

The response option regarding the students' good state of mind during learning sessions obtained the lowest value of respondents' choices, 12.24%, probably due to the high proportion of students who already had learning experiences in online environments and for whom the shock of learning exclusively in online environments was felt less. The importance of the pre-existence of learning "dispositions", meaning the prior state of preparation, for learning carried out in online environments is validated, which in the present case prevented the possible shocks of adapting to learning carried out in new contexts, less experienced by students.

The interpretation of the answers led to the identification of a coherence in the expression of the answers for questions 5 and 6, at least in relation to the preferences expressed by the students for the performance in "face-to-face" learning environments of: solving problems in collaborative group works (the question 5) - discussions and debates with teachers and/or colleagues, respectively (question 6), the organization and development of assessment situations (within seminars/final assessment) (question 5) - the level of teachers' appreciation of the work done/motivational aspects of learning (question 6).

Question 7 requested the expression of opinions regarding monitoring factors for student learning used by teachers in online environments, respectively in "face-to-face" education environments, by creating individualized hierarchies of choices and answers based on the intensity of preferences.

From a quantitative perspective, the responses provided, including by multiple preference placement, were more in favor of face-to-face learning environments compared to online environments, which points to a preliminary conclusion of making monitoring of student learning more visible and constant in face-to-face learning environments.

The most favorable responses hierarchically associated with teachers' monitoring of learning in face-to-face environments considered factors such as: explains his goals and expectations regarding assigned learning tasks to students; gives students opportunities for dialogue/expression of personal opinions; provides with comments/recommendations for the draft form of the students' work (upon their request).

On the other hand, responses with predominant values in the middle band of the intensity of associations, that approached the monitoring of learning by teachers in "face-to-face" learning environments referred to the choice of factors such as: gives examples of students' works which optimally meet its requirements (good student practices); encourages and values students' learning activities; provide immediate feedback to students/debriefing discussions after providing feedback for presenting individual or collaborative student work; is concerned with the final review of students' work before the exam; communicates the assessment criteria for students' learning activities; provides support for the formation of self-assessment learning skills in students.

For two of the factors of monitoring student learning by teachers in "face-to-face" environments, the lower positions obtained in the hierarchies made by the respondents were occupied by answers such as: shows current concerns for improving student learning (e.g. answers clarifying questions; provides explanations/ additional examples at the request of students; assigns additional learning tasks for students interested in topics studied / who are behind in coursework, etc.), respectively uses assessment practices that support the improvement of student learning.

In relation to the preferences expressed in the student hierarchies for learning monitoring factors in online environments, the values obtained were similar to those associated with "face-to-face" environments, but less numerous and with somewhat more frequent choices that tend to be negative (values 9 – 11), for the factors: use assessment practices that support the improvement of student learning, demonstrate current concerns for the improvement of student learning, provide support for the formation of self-assessment skills of student learning; is concerned with the final review of students' work before the exam; gives examples of student work that optimally meets its requirements (good student practice; provides immediate feedback to students/clarifying discussions after providing feedback for presenting individual or collaborative student work).

The interpretation of the data obtained for question 7 allows the drawing of some interesting conclusions regarding the perspective of some aspects related to the monitoring of student learning by teachers. Thus, for learning carried out in online environments, teachers have fewer opportunities to monitor learning, compared to "face-to-face" environments. Furthermore, we did not identify factors that indicated a particular increase in relation to monitoring learning in online environments. Therefore, for learning in online environments, other forms of monitoring are needed to be put in place to support teachers, forms that should involve additional support staff, be based on predefined monitoring elements that can be followed more easily etc.

On the other hand, although in the situation of "face-to-face" environments, the monitoring of learning by teachers seems to be carried out sufficiently by many reference factors proposed in the questionnaire, consistent improvements are required regarding the completeness of monitoring, the use of feedback mechanisms and the further improvement of student learning.

In order to be able to identify the students' proposals in relation to recommendations regarding the continuation of supporting learning in online environments, based on the lessons learned during the pandemic period, question 9 concerned the choice (including multiple-choice) of some answer options, but also the expression of personal opinions. Respondents expressed their belief in a significant proportion, 61.22%, that to continue the use of online learning in academic environments, the unified use of digital tools in the university is necessary based on a clear strategy regarding ICT communication tools, including collaborative ones. With relevant percentage weights and close in value, the students also appreciated the availability of streaming equipment for recording courses and seminars (42.85%), respectively the generalization of combined learning to improve students' learning experiences (36.73%).

Considering the general tendency of the answer choices of the student respondents, based on an individualized spread towards the answer options associated with online/"face to face" environments, we can consider that blended learning is especially preferred by students who are professionally employed during their university studies or for whom it would be less expensive to study at home outside the city where the university is located. In terms of ensuring easy access to university studies, hybrid organized learning could be a reasonable solution, in combination with the unified use of digital tools in the university based on a clear strategy regarding ICT communication tools, including collaborative ones.

The questionnaire addressed to the students also included 3 questions with open answers, from which we will exclude at the level of interpretations the last question (question 10) regarding the addition of other useful information that the respondents would like to add in relation to the topic of the questionnaire as it did not generate any answers from student respondents.

Question 8, which considered the expression of views on the appropriateness of the need to provide learning support for students, through a learning process analyst to exist as a specialist in the university to help build effective learning skills

in students, generated varied, particularly interesting answers, with a significant value from a practical and predictive point of view in terms of the delimitation of options for optimizing student learning.

Although 16.32% of the respondents appreciated that such a specialist would not be necessary in the university, most respondents (55.1%) recognized the need for a dedicated specialist in the university to analyze the learning processes and provide support to students based on several types of individually formulated arguments. Several answers revolved around arguments like: *He/She could have helped me with putting my learning style into practice" or that such a specialist "could help you learn faster and more effectively.*

Other respondents felt that such a specialist could be useful because: *Most students show a lack of concentration, attention, and the learning process is carried out differently; Would help students learn; Students, especially first year students, do not know how to manage their courses and would need help; Could support students in the learning process through personalized methods. Along with the student, he can find an effective learning method.*

Another response formulated established a relationship between online/"face-to-face" learning environments in a very suggestive way: *The transition from a face-to-face format to an online one was hard for many of us. Students underwent a major change in their attitude towards teachers and the subject they learn, not taking it as seriously in the online environment. In my case, such a specialist would be useful for support in a competency assessment and my preparation for it, including effective ways to retain information in the long term.*

Finally, other respondents believe that a learning process analyst: *Would help students manage their time or could provide: The more elaborate explanation of the details within a study program or could provide time-effective answers for the student's doubts or gaps, so that we can benefit from a small guide to help us evolve.*

The questionnaire included an open-ended question that sought to make recommendations for teachers to ensure improved student learning experiences in the post-pandemic period, based on lessons learned during the pandemic period.

The recommendations made by the students were quite numerous and diverse, although the question did not direct the possible answers to predefined thematic directions.

A preliminary analysis of the types of answers provided allows them to be grouped into 3 categories relevant to the objectives of the study, with reference to suggestions for: improving course materials in the post-pandemic period, combining learning in online/"face-to-face" environments, respectively of streamlining teaching processes, teaching roles, especially by considering in a more accentuated way the learning needs of students.

In relation to the improvement of course materials, the responding students recommend to university teachers: *To review/update the courses based on the lessons learned during the pandemic because all teachers should use the online environment and be used to taking online courses.*

Other recommendations refer to the necessary measures to digitalize courses and to change their structure and operationalization in relation to students: *The courses should be digitalized and the information should be clearer and more concise; The courses should be more interactive, more schematized, more essential, should be built on the basis of some interactions to maintain the students' attention.*

The students' recommendations regarding teachers' promotion of blended learning in university education were made from multiple perspectives. On the one hand, we identified the correlation of the suggestions made by the respondents with intentions to make academic learning more efficient/facilitating: *The combination of physical and online facilitates learning especially in the university area; To effectively combine online and face-to-face methods so that we can download courses from online platforms and upload course-specific assignments; Using technology, either as a means of assessment or as forms of exposure of some helpful materials; using technology as a method of teaching but also of communication with students to make life easier for both parties* but also, with the possibility of ensuring easier access to university education for students from other cities of the country:

I would recommend teachers to allow for us to record courses in order to make it easier for students from other cities to participate.

I would also suggest that they continue to use platforms such as Google Classroom to make the presentations used or materials intended for student documentation available outside of class hours.

Beyond the usefulness of the combined achievement of academic learning in online/"face to face" environments in support of facilitating access to studies and more effective learning, it is also worth remembering the recommendation regarding the need for specific training of teaching staff in the field of ICT-based learning: *Some teachers need to be trained in ICT; there are more applications/sites than the usual ones that are interactive, enjoyable.*

For the learning processes offered to students by university teachers to become more effective in the post-pandemic period, the students formulated some pertinent suggestions starting from: *Capturing students' attention during the course; information to be simplified and explained whenever needed.*

Regarding how the courses are conducted, they could: *To rely more on practical activities than on some documents that can be accessed on websites; To use presentations, to explain information through examples, to make the connection between theory and practice; To insist more on active learning and less on mechanical learning; to use new approaches.*

The learning resources proposed by teachers could also be improved, according to the respondents: *The materials they choose to share with students should be livelier. Don't get lost in the actual subject, because it becomes monotonous, and in this way, the students' attention is lost.*

And from the perspective of the relationship between teaching staff and students, improvements would be desirable, some of the respondents indicating the need to:

More involvement in the teacher-student relationship, or teaching behaviors based on understanding, better communication and empathy towards students: Teachers should be more understanding, giving us the assurance that we can do it even if we had a slower start / patient, communicative because we need to support each other; From time to time it is good to ask students for feedback, assertive communication can be effective. Assessment through communication can reveal to us what each one needs, that way each one is not alone or misunderstood etc.

5. Conclusions

The students' answers validated once again what the specialist literature calls "technostress" ("Problem of adaptation that individual experiences, when he or she is unable to cope with new technology", Tarafdar *et al.*, 2007 in (1), p. 29), including the relationship to learning during the pandemic period, because it "is affecting all members of the academic community: students, professors, and staff (Charles *et al.*, 2020; Abilleira *et al.*, 2020 in (1), p. 29), showing that universities need to provide better solutions to monitor and provide support for this specific matter" (in (1), p. 29).

On the other hand, for the post-pandemic period the combined learning processes in online/"face-to-face" environments seems to be a balanced solution for reducing inequities related to easy access to academic learning for students with reduced economic opportunities.

From the perspective of ensuring a combined approach to learning in academic environments in the post-pandemic period, the recommendations made by a group of authors from the University of Innsbruck regarding ensuring the mandatory training of teaching staff in higher education should also be remembered: "Regular and compulsory training for teachers in these new opportunities is, in our opinion, the only option to keep university teaching up-to-date with the young generations' expectations of education in the post-pandemic, post-digital age. For teachers to be able to reserve sufficient time to acquire and update their digital skills, it will be necessary for universities to offer corresponding teaching reductions." (Bork-Hüffer, *et al.*, 2021, p. 22).

In conclusion, the usefulness of the lessons learned from the pandemic period for improving the design of university education processes in the post-pandemic period was well demonstrated by the results of the conducted study, the analysis of the opinions expressed by students being significantly for substantiating some decisions on this topic.

Some of these benchmarks, derived from this study, consider:

- The importance of establishing a balanced weight of the organization of learning in a hybrid/blended format, so that both the strengths of online learning and those of "face-to-face" environments are exploited, possibly by establishing an accepted frequency for courses to be conducted in the online format or for students to have the option to participate in temporary/permanent online courses, due to reasons accepted at university level (e.g. medical reasons, professional employment, vulnerable socio-economic situation, etc.);

- Regulating the unified use of digital tools in the university based on a clear strategy regarding ICT communication tools, including collaborative ones; such an approach should ensure clear quantification of the number of users, students and teaching staff, for the online environment, but should also include the functionality of monitoring learning processes based on learning analytics, established by adapting them to the particularities of each specialization university;
- The development of learning analytics, its customization and improvement could constitute one of the basic roles of the learning process analyst, a new type of specialist that could exist in the university with the aim of supporting the quality of university education; the roles of the learning process analyst would be multiple and associated with the needs of didactic staff (related to the intention to build and provide learning situations as appropriate and adapted to the needs of students, monitoring and improving the effects of learning, etc.), but especially with students' needs (to reduce difficulties in learning processes, to support the strengthening of transversal competence to learn to study in relation to the specifics of undergraduate university studies, etc.).
- The need to associate a type of university education environment, be it online or "face-to-face", with learning analytics, meaning parameters for process analysis through which the quality of student learning can be monitored, as well as the mediation of some ways to improve the situations indicated preventively by the daily monitoring measures. For example, in the case of the students participating in the questionnaire, coming from the Social Work specialization, i.e. a specialization in the socio-human studies category, the recommendations for improving the learning experiences of the students in the post-pandemic period, based on the lessons learned during the pandemic period, had in particular aspects related to reducing the excess of theoretical approaches from courses in favor of interactive ways, based on practical applications, use of learning resources in digital format. It is quite likely that, in the case of surveying students from technical specializations, the students' recommendations would reflect a different specificity and could constitute the beginning of other useful research and practical approaches to increase the quality of learning in academic environments.

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