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Teaching techniques adapted for online delivery to achieve course learning outcomes in a virtual environment

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Abstract. Today we are moving from traditional learning to *e*-learning via digital means. The entire humanity *learned* how to adapt *overnight* to digital life and leave the traditional doing things behind. Digitization has been around for several years, but its use has become a necessity with the Covid-19 pandemic. The blockade forced us to work remotely overnight, to use digital networks to communicate, make payments, learn, all sectors of activity had to adapt to the digital age in one night. This paper shows how the teaching and learning approaches need to adapt to new communication requirements and students' needs to achieve course learning outcomes in a virtual environment. This paper uses both a quantitative and qualitative method to analyze the professors and students' perspectives on the techniques of online teaching-learning, during the isolation period and after, and what are the best methods recommended to be used for online learning taking into consideration how students can maintain their class's attention and how can get actively involved in a learning process. The value of this study is to develop a holistic image of online teaching-learning-assessment activities, to ensure the efficiency and quality of the educational process in the university environment.

Keywords: online teaching and learning techniques; means of engagement; higher education.

1. Introduction

The emergence and spread of the Covid-19 pandemic triggered a major economic and social crisis. At the higher education level, the pandemic has brought to light a set of contradictions that have been present in relation to online teaching, the tendency to stagnate in the implementation of new information technologies, and reluctance to adopt the study plan to the needs of students. In the last year, it was said that the entire education system, at all its levels, was collapsed during the isolation of the Covid-19, around the globe. Contemporaneous authors underline again the importance of technologies, and this not because it gives students access to a plethora of online materials, but it also helps them study [1-2].

It is undeniable that the world wide web has launched a comfortable place for teaching and learning. Although educators at all levels have accepted the use of online technology as a teaching tool, the problem of the methods used and the evaluation of student learning in an online course must be solved for the real effectiveness of this approach. Digital campus and online teaching are not new techniques [3]. They have been used successfully by several universities in recent years. However, before the virus appeared, online teaching and adapting teaching and assessment techniques to the virtual environment was not a priority. Now, more than ever, it is necessary to adapt teaching and learning techniques, because the whole society needs a proper education. The year 2020 apparently was the one in which all educators realized that while traditionally, higher education has been designed in a face-to-face manner, not

only have learning activities moved online, but the campus experience is no longer the benchmark with which all university education is compared [4].

The present paper aims to present pertinent methods to maintain students' attention focused combined with different teaching, learning, and evaluation techniques specially adapted for online teaching. This paper presents teaching-learning-assessment methods and techniques encouraged to be used in the online environment, starting from the knowledge of how the student's memory and attention work in the learning process within the virtual environment; feedback received from both students and teachers; the gap between the minds; flexible teaching techniques centered on student-learning, student social identity and various classrooms.

2. Literature Review

The teaching method is the mechanism that is used by the professor to organize and implement a series of educational means and activities to achieve certain goals [5]. The chosen teaching aids must correctly reflect the learning process, by ensuring that competencies, knowledge, and skills are successfully acquired by students. Certainly, teaching is much more effective when tutoring methods are adapted to new technologies and to students' needs in order to be able to easily meet the new requirements of the labor market. Online teaching requires the active involvement of all staff, teachers, administrative staff, and students, as well as coordination between various institutional departments and between institutions themselves. Teachers are called to actively collaborate with administrative staff and those responsible for information technology.

Academics in the field of education [6, 7] have identified three types of assessment used for business education students: traditional, alternative, and performance. According to the authors, traditional assessment usually measures lower-level cognitive skills. These assessments are based on recall and understanding of the facts. The alternative assessment determines the affective domain and includes team activities, self-assessment and peer assessment, and reflection through journals and portfolios. This type of assessment examines students' attitudes and character traits. Performance appraisal measures the psychomotor field and includes students' demonstrations of proficiency in a skill or task. Examples include formatting documents and completing financial statements.

While many academicians and researchers tried focused on finding ways for a smooth and good transition from teaching and learning on-campus to online, some other educators and professors expressed their concerns related to the content communicated, delivered to the students [8]. Earlier in 2001, Professor Gold also stated that the transition from in-classroom instruction to online instruction is a complex one involving specialized training in the technical aspects of delivering quality educational materials (or environments) to the students, and specialized training in how to foster knowledge acquisition within this new environment [9]. Research has shown that teachers who have started teaching online have a more constructivist orientation, increasing the value of student-teacher interaction and communication, but there is no talk about the value of communication content.

In 2006, a study conducted by professors Lewis and Abdul-Hamid emphasizes the importance of feedback received from students but also given by teachers to students in the process of implementing online teaching practices [10]. Our research fully supports this statement and emphasizes that providing feedback to students is a constructive process, stimulates interaction and involvement, facilitates student learning, and support professor to organize/ adapt the course study plan according to the students' needs.

Later, in 2007, professors Zapalska and Brozik, from Finance and Management departments underlined that individual learning styles must be taken into account in

the course design template used in online education [11]. The paper argues that, once the professor identifies the students' learning ways, then it is viable to design an appropriate context of learning. Our research will present that students' learning style is better to be combined with different means to capture and maintain the students' attention. Hung and Zhang (2008) analyzed online behavior to be able to see the achievements of learning outcomes [12]. We strongly agree that student behavior is helping in developing the teaching, assessments, evaluation techniques. However, memory, attention focus, and students' feedback is better to be taken into consideration too, as it will be presented here.

A group of researchers from the School of Management Science and Engineering, Central University of Finance and Economics, Beijing, China [13] stated that cross-disciplinary and cross-curricular teaching and learning models have become a new direction of development. As a typical interdisciplinary specialty, most construction management gradually introduces innovative teaching methods, such as workshops, reverse classrooms, peer training. Though, the respective internal application of these teaching methods has not led to a systematic evaluation system. Therefore, the authors observed, indeed a clear need to amend current educational system approaches. In recent years, it has been observed that on-campus teaching, through face-to-face meetings, has been replaced by digital interactions or digitization. Teaching needs to be updated. Digitization and digital services in teaching finance and business management promise a universe of applications and digitalized assets that are expected to work together to allow rapid development of new capabilities that will give competitive advantage and equip the new generation of students with employment-ready skills [2], [14-17]. Technological innovations such as blended learning are rapidly changing teaching and learning in the higher education system [18]. The main activities carried out in higher education institutions aim at research and teaching; knowledge transfer through work-based learning or industry-oriented activities applied teaching and the development of digital skills through the increased use of digital technology [19].

One question emerged among teachers and students *This is how the education system will go from this moment forward – online?* There has been a lot of debate lately about the quality of online and face-to-face teaching and learning. These discussions focus more specifically on issues related to teacher engagement, resources, assessment and skills, their preparation to provide online learning effectively [20]. One thing is certain, society is evolving in the direction of digitalization, and education must adapt. So, online teaching will be common practice from now on. It is true that experience on-campus cannot be compared with the online one. The interaction is different, and rapport student-professor is more active within an on-campus environment. However, online education is already established, and it is here to stay, fully online or blended. Much more than this, the practical approach presented in the 21st academic study plan now enables practitioners to participate in a large number of blended courses, helping the educator and students to fill the gap between the theory and practice.

3. Data and Methodology

The research started from three main objectives: the gap between the minds and how to capture the student's attention; flexible teaching techniques student-learning centered; and teaching, learning, and assessments methods updated for online environment education delivery mode. To achieve the research objectives, this study used the data and results of previous research developed by the same author [21].

To answer these research objectives, we adopted the interpretative qualitative research method [17]. Contemporaneous researchers underlined that interpretivism recognizes that social phenomena must be understood in the social contexts in which

they are constructed and guided by the way people interpret and understand situations [22, 23]. For our study, it was considered that qualitative research is most appropriate as it crosscuts disciplines, fields, and subject matters [24].

The chosen research method, the qualitative one, was based on the skills of relationship and empathic listening, which the author used to develop confidence, care, and sense so that participants are more willing to offer truthful explanations for their views.

The research started in early 2020 when the world faced the Covind-19 pandemic. The research was carried out through successive interviews with representatives of higher education institutions, students, and professors from finance and business management specializations. The interviews focus on 1. students' ability to adapt to online teaching and learning process, to actively participate in each course, to demonstrate a comprehensive understanding of the subject taught, and to prove the successful achievement of knowledge, skills, and competences acquired, in line with the objectives of the course and program of education; 2. teaching and learning techniques and relevance of assessments amended for online delivery mode, student-centered learning, professor-student rapport on virtual environment.

The analysis helped the research to understand the importance to be given to the achievement of course/program learning outcomes, the need to change the teaching, learning, and assessment techniques, as well as different approaches in maintaining a centered student learning.

4. Results

4.1. How memory works and how to capture students' attention

The efficiency of the educational process is also given by the method in which the optimal teaching approach is identified, depending on the students' ability to understand the respective topic. It is also crucial to understand how students' learning takes place because of the teaching approach that the teacher chooses.

Memory implies a continuous process of retaining information over time. It is an integral part of human knowledge because it allows individuals to remember and be inspired by past events to frame their understanding and behavior in the present. Memory also provides individuals with a framework for making sense of the present and the future. As such, memory plays a crucial role in the teaching and learning process.

A closer look at the cognitive processes that underlie how people learn can help ensure that the teaching methods chosen are as effective as possible to reach your students. It is necessary at the beginning that every educator understands how human memory works. which is the foundation of students' understanding and performance. The research will make a brief review of the cognitive processes that allow problem-solving, encoding, recall, retention, and memory retrieval (Fig. 1). Thus, each educator had a better understanding of how learning works and how teaching methods should be best adapted to facilitate students' learning and understanding. Generally, there are three main processes that characterize how memory works: encoding, storage, and recall [25].

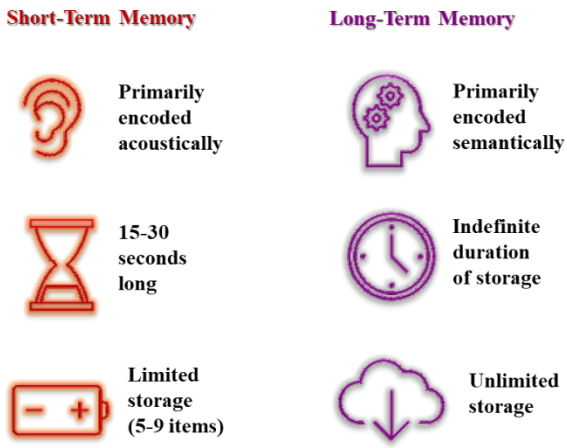

Fig. 1. Memory and learning process.

Encoding refers to the process by which information is learned. How information is retrieved, understood, and modified to better support storage. The information is usually encoded by one (or more) of the four methods [26]:

1. Visual coding (how something looks)
2. Acoustic coding (how something sounds)
3. Semantic coding (what something means)
4. Tactile coding (how something feels).

While information usually enters the memory system in one of these ways, the form in which this information is stored may differ from its original form. Usually, visual and semantic coding are long-term memory; while, acoustic and tactile is short-term memory.

Storage refers to how, where, and for how long the information encoded in the memory system is retained. According to Roediger and McDermott [27], storage highlights the existence of two types of memory: short-term memory and long-term memory. The encoded information is first stored in short-term memory and then, if necessary, stored in long-term memory.

Recall is the process by which people access stored information. The information is taken differently depending on how it was stored (short term or long term). While short-term storage is taken over in the order in which it is stored, long-term storage is taken over by association [27]. However, retrieval is subject to error because it may reflect a memory reconstruction. This reconstruction becomes a must when the stored information is lost over time due to damaged retention.

Now, knowing how the memory works, if educators want their students to recall the knowledge for a long term and also be able to implement it further in their work or further professional developments, they will use primary encoded visually (short video, graphics, educational games) and semantically (storytelling, cases from the real world, cases brought to your attention by students based on their experience or professional interests).

4.2. The gap between the minds

We have not often met professors who complain that students do not understand things that, in the educator's perspective, are very simple. Here, as an educator, it is important to recognize what is known as the gap between minds. Each professor should be aware of the gap between what you know and what your students know and then take the appropriate steps to reduce this difference. The teaching and

learning techniques used must also aim at reducing the gap between minds. The literature has identified four main factors associated with the gap between minds, namely mental state inference; the curse of knowledge; hindsight bias; and egocentrism.

Fig. 2. The gap between the minds.

Mental state inference. It is generally acknowledged that we are aware of what we think and feel at any given time. But how do you know what others think and feel? Because you don't have access to other people's minds, you need to do your best to guess what they're thinking based on the information you can observe. As an educator, you need to use a range of information to deduce students' mental states. This information is related to students' physical behavior, as well as the ability to put themselves in their place and imagine what you thought in their situation [28, 29]. As a professor, recognizing assumptions about what determines the behavior (and performance) of students it can help to shape the way the professor is teaching to better support learning and understanding. This can be done by using active and collaborative learning techniques, as well as through direct discussions with students about the ways in which they learn the best.

The curse of knowledge refers to the fact that increased knowledge about a subject can affect the ability to effectively predict how much knowledge others have. This phenomenon has several important consequences, the most important of which, from an educational point of view, is the difficulty of sharing your knowledge with others [30-32]. There are cases in which the professor who understands very well the subject he teaches, and may also have practical experience in the field, could encounter difficulties in finding a close way of teaching, from the perspective of the student, who, compared to the teacher is usually novice in the field. Therefore, professors can struggle to explain the concept to students. In other words, because the professor knows a concept so well, he has a hard time imagining what it's like not to know it. As a result, he may not present his explanation at the level of detail that would be most useful to your students [31]. As an educator, it is very important to realize *the curse of knowledge* phenomena and to prepare the lesson plan from the perspective of students.

Hindsight bias has implications for student learning and comprehension because it can prevent students from critically analyzing information to foster a more nuanced understanding of why one outcome is correct, and the others are not. Have you ever thought about the outcome of an event and thought "I knew it was going to happen" or "I knew it all the time"? This feeling is known as retrospective bias (retrospective prejudice). It is a psychological phenomenon in which individuals see past events as more obvious than the same future events. This leads to excessive simplification of events (seeing their cause and effect as more predictable than they

were), making incorrect decisions, or developing (and promoting) a unilateral or biased view of events and information [32].

Egocentrism refers to an inability of an individual to consider the perspective of others. As is evident in previous discussions about the curse of knowledge and hindsight bias, being unable or unwanted to analyze and incorporate student perspectives can prevent the teacher from understanding the information in detail. Although the professor's role is to share his knowledge with students, it is important to consider the most effective ways to do this. Thus, the professor is good to encourage students to provide feedback after each course, but also to be actively involved with the information provided and use it to build their own knowledge and reach their own conclusions.

Students are very easy to be distracted from the class, especially within an online teaching environment (Fig. 2). There are two types of motivation that may influence how students can be engaged in learning experience: intrinsic, which refers to the motivations that stem internally; and, extrinsic motivation, which refers to external factors that influence student performance and motivation. Bain [34] identifies numerous research-based strategies that teachers can use to motivate their students. Eight of these strategies are listed in Fig. 3.

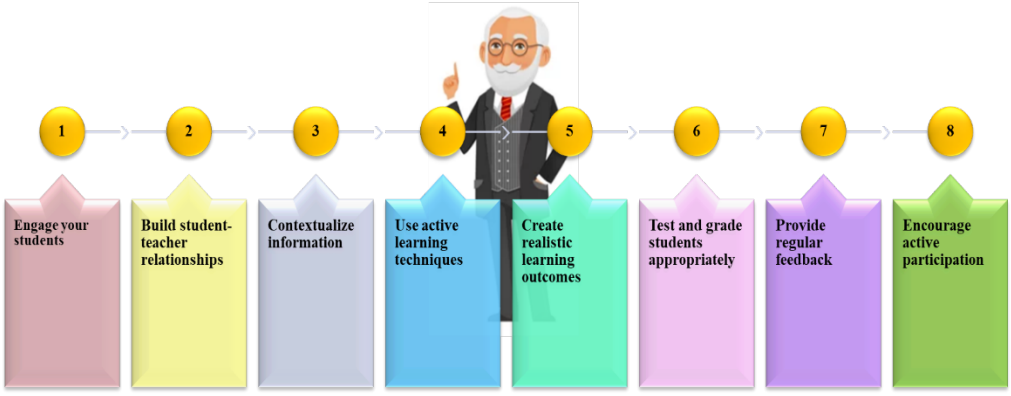

Fig. 3. Strategies used to encourage students' attention, motivation, and performance [34].

4.3. Teaching techniques to improve the recall within online environment

The efficiency of the educational process is also given by the method in which the optimal teaching approach is identified, depending on the students' ability to understand the respective topic. It is also very important to understand how students' learning takes place as a result of the teaching approach that the teacher chooses.

It is important for every educator to be aware that the teaching techniques used must promote better retention and remembrance among your students. In the practice of education, there are three main techniques effect of testing, spacing, and intercalation.

Testing effect. In most cases, tests are normally considered to be a method of periodic evaluation. Periodic testing at the beginning or during class (one-minute paper) helps the professors to understand how well their students have learned the material taught or provided. At the same time, frequent tests and are considered one of the best ways to learn in the first place.

Active and frequent testing helps the memory retention process when learning new information. By actively and frequently testing, encouraging students to regularly remember the information they have recently learned helps them to store the

information in long-term memory, which they can use at a later stage of the learning experience [26]. Active testing can take place at any time during teaching (at the beginning, middle, or end of class) through a one-minute paper, a short questionnaire, a free-answer question, asking them to remember what they learned on that day or the day before. At the beginning of the class, testing is about a previous lesson or what the student is supposed to read for the present class. Middle of class, testing may refer to new topics or information presented during the class. At the end of the class, testing refers to the main ideas, concepts learned during the class. Within an online environment, *questions can be provided via MS Forms, requesting short (one to five minutes) answer*. Tests can be incorporated as a small quiz as well.

Spacing. According to the spacing effect, when a student learns and remembers information over a long period of time, he or she is more likely to retain that information. Educators are encouraged to structure the learning process using the spacing technique. For example, in each course, the professor is called to recapitulate the notions of the previous course, to make the connection with the topic of the current course and the next one. The professor is encouraged that, instead of introducing students to a new topic and its related concepts in a single move, to cover the topic in segments over several lessons [26]. Moreover, try to use the *visual and or sound effect* by adding suggestive cartoons to your lesson's materials, including *short videos*.

Intercalation refers to the technique is when students practice several related skills in the same session. This technique has proven to be more successful than the traditional locking technique (students practice only one skills or competence) in various fields [26]. This technique refers to the combination of knowledge, competencies, and skills previously acquired, in the same course or in preparatory courses (for example during *Financial Management* class, students are called to use the knowledge gained in the *Accounting* and *Micro/Macroeconomics* classes, as financial decisions are based on information from accounting and economic data).

4.4. Learning techniques to improve the recall

As presented above, it is important for every educator to know what techniques he can use to improve the recall of information by students. At the same time, the professor must be aware of the learning techniques that students can use to improve their own memory. According to the students interviewed in this study, but also based on literature review in the field, there are four main techniques: state-dependent memory, schemas, fragmentation, and deliberate practice.

State-dependent memory refers to the idea that being in the same state in which you learned the first information allows you to better remember that information. The state refers to the environment of an individual, as well as to his mental and physical state at the time of learning [35].

Schemes refer to the mental frameworks that an individual creates to help him understand and organize new information. Schemes, graphs, colors act as a cognitive quick command by allowing individuals to interpret new information much faster [36]. Beware, however, that excessive use of schemes can prevent students from learning relevant information that does not fall within the scope of the scheme that was created. Students must be taught how to create a schema, what is the information contained in the schema, and the links between the schema and other information that cannot be included in that schema or does not align with existing beliefs and conceptions on a subject.

Chunking is the process of grouping information together to make retention easier. The grouping of information is very important in the process of learning and teaching. The plan of each lesson must include this technique. The information is delivered in groups. thus, students, instead of remembering each individual topic,

remember the whole group and then can more easily take over each topic in that group [37, 38]. Chunking facilitates better memory recall by separating information into small groups to be easier to remember and help the students to Identify patterns. Understanding patterns and principles will enable retention.

Deliberate practice refers to the act of deliberately and actively practicing a skill with the intention of improving understanding and performance in that skill. By encouraging students to practice a skill continuously and deliberately (e.g., writing a well-structured essay), it will be possible to ensure better support of that skill [26].

4.5. Design learning framework for online teaching

The purpose of learning design is to create flexible learning materials and methods that can be used by a diverse range of students. The universal design for learning framework is meant to support the multitude of ways in which learning takes place. Figure 4 illustrates the three principles upon which it is based.

Multiple means of representation through which information can be presented to students. It is based on the multitude of ways in which students perceive and understand information, due to a variety of physical, cognitive, and psychosocial reasons that exist on a spectrum or continuously. This principle also looks at teaching methods and how best to ensure that all students have access to how concepts and ideas are emphasized, connections are made, and questioning is modeled [39].

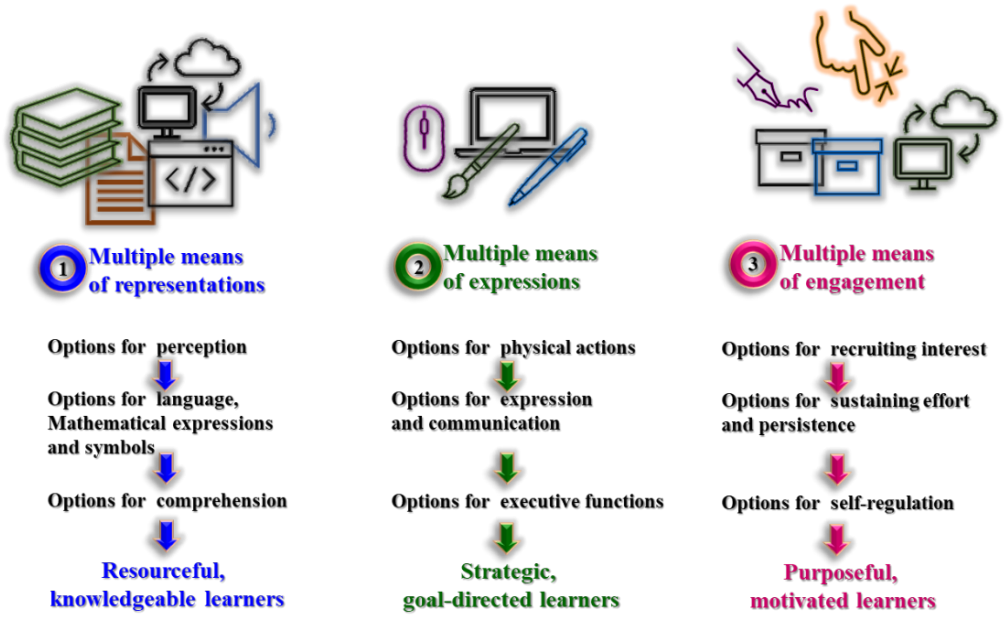

Fig. 4. Principles of designing the learning framework.

Multiple means of expression take into account different methods by which students express their knowledge and understanding. Because students differ in their (motor) skills and abilities in different areas, it is important to allow them to express themselves through the area with which they feel most comfortable [39].

Multiple means of engagement talk about the different ways in which students may need or choose to become involved in the learning experience. This can be determined by and, in turn, can determine their motivation to learn [39]. This motivation can be internal and external. In this context, there are three general

themes that can determine how much a student is involved in the learning experience: 1. Spontaneity and novelty; 2. Risk and challenge; 3. Dynamism and collaboration.

4.6. Learning techniques to improve the recall

A study conducted under the Erasmus+ program of the European Union defines very clear the active learning understandings. In this regard, active learning is described as an approach to instruction that involves actively engaging students with the course material through discussions, problem-solving, case studies, role plays, and other methods [40].

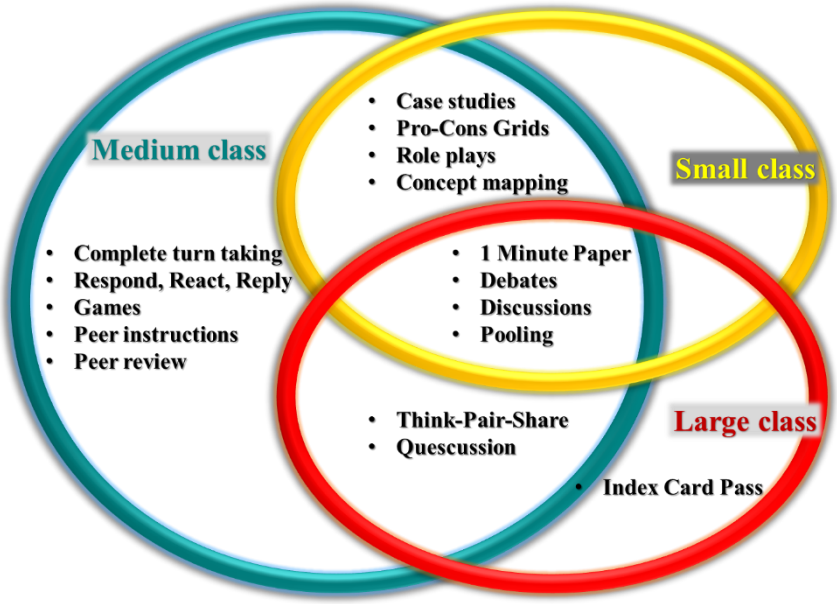

Fig. 5. Teaching techniques for active learning.

In the case of online teaching and learning, depending on the management system used, you can create discussion sub-forums and sort students into teams, smaller groups, and choose different techniques (from those shown below in figure 5) to respond to the assignment within a given period. Once students have summarized their answers, they can post their answers on a larger forum where all students can read and comment on the answers.

The design of the lesson is very important, starting with a short recap, introduction, continuing with the body of the lesson, concluding, and announcing the topics that will be discussed in the next lesson or lessons, and what is the connection between the topics taught. However, lesson design alone is not enough, teaching in the sense of maintaining students' attention and interest in the class is just as important. Involvement, active participation of students is essential to help them understand the topic discussed, to retain it, and to be aware of its importance further. Students are motivated when the notions taught in class are explained with the help of examples from their environment, from situations known or experienced by them, using a range of active techniques.

Certainly, the motivation of the students depends equally on the subject taught and on the way in which the teacher engages the students in the delivery of the lesson. At the same time, the way students are engaged in the teaching process depends on the size of the class - small, medium, large, on the delivery method - face to face, blended or online, as well as their background, or prior knowledge. Examples

related to their knowledge, background, real-life examples, analogies with current cases, storytelling by asking students to solve certain class activities by applying the knowledge gained for sure it may help. Below are some examples of active teaching which can be equally used for face-to-face classes, as well as easy to adapt for blended and online learning.

A variety of software tools allow instructors to ask a question and immediately collect feedback from the entire class. Depending on the software, students can answer a multiple-choice question using a telephone or computer or a portable clicker (also known as a personal answering device). In addition to multiple-choice questions, many online tools allow for different answer formats, including short text input, drawing, and filing (MS Forms for example).

1 Minute Paper. Students are asked to answer a question with a short reflection. The question can be related to the subject previously taught, to the materials required to be covered before class, or to any topic related to the current course. The answers must be concise. The answers are sent in the specified type (1-2 minutes), online, via in-person in class. The answers are collected and commented in class with all the students.

Pooling provides real-time instructor feedback from all students. Asking a question and collecting students' answers takes only a few minutes and can be integrated into any type of course, including lectures. A particularly effective strategy is to ask each student to first answer the question independently, then discuss the question with a neighbor, and then vote again [41].

Some of the most used active teaching techniques aimed at hiring students are certainly discussions and debates. Involving students in discussions and debates encourages them to create their own understanding of the content and connect it to their experiences. Learning is enhanced when students are encouraged to form opinions and develop their own ideas about content [42].

Debates are classroom discussions in which students argue for or against a particular proposal. In doing so, students' knowledge of a given concept is tested by their ability to present a convincing and effective argument. The dynamic, back-and-forth nature of debates gives students the opportunity to improve their critical thinking skills (higher order), as students are asked to make immediate, intellectual remarks in response to arguments from the opposing team or student [43].

The purpose of the discussions is not for students to discuss a topic (as opposed to debates). Rather, the ***discussions*** are meant to encourage students to become meaningfully involved with a concept as a group or an entire class. Through discussions, students can explore a concept in detail and, by sharing their thoughts and opinions, can develop or improve their understanding of the concept in question. Discussions are meant to be a space for collaboration in which students learn from each other [44].

Case studies represents a great activity for students to work on the practical applications of theoretical course materials. This activity provides students with real-world cases to study (news articles, accounts for decisions, videos, or real cases provided by the students, etc.). Cases are analyzed using guidelines and frameworks provided by instructors and can work in teams or individually. The students' analysis is presented to the entire class as individual, or group written answers. In the case of on-class presentation, the discussion should connect the case study with class materials.

Pro-Cons Grids support students in developing analytical and evaluative skills. This technique asks students to go beyond their initial statements and reactions and come up with points of discussion for the other side of the issue. It requires students to weigh the points of competing statements and concerns [41]. The topic is usually given by the professor and students are encouraged to make a list of pros and cons/ advantages and disadvantages for that topic.

Role plays is an active teaching and learning techniques through which students take on and act out roles in a case-based scenario. The role play can be carried out one-to-one (individual role play) or as a group role play with each member in the group taking on a role/character. Roles and rules for a role play are clearly defined in the script [42]. Role plays can help students achieve various learning outcomes, may practice skills such as team player, negotiation, decision maker, employer, supplier, client etc. or take on the role of another person to understand their point of view, or act out a scientific process [45]. In case of role play activity, clear guidelines should be provided by professor.

Concept Mapping is a visual tool used to show the relationship between concepts. The professor provides students with a list of terms or concepts. Students generate a concept mapping by arranging the terms on paper, drawing directional arrows between related concepts, and writing a sentence over each arrow to describe the relationship. Through this process, students enhance their learning and develop, or strengthen, higher order thinking skills.

Think-Pair-Share is an active learning technique which involve three main steps: Think – reflect about the answer to the question, better in writing; Pair – partner up with another student and discuss the response; and Share – discuss the response with the group and then share with the class to conclude the assignment. This technique is recommended to be done in within, face-to-face and online, with clear time for each stage. When encouraging students to share their responses with the rest of the class, it is common for professors to ask students to select one speaker from their pair (or group) to share the response. This gives students practice synthesizing information as well as presenting.

Quescussion refers to a learning technique which involve discussions through questions only. On a topic given, students may only respond or add to the discussion in the form of question. This is a form of informal learning which give the students possibility to actively involve their creativity and their judgment skills. By getting students to ask questions, they are actually invited to generate a variety of thoughts about the topic without them directly stating their own views. With each question students will likely think of answers to the proposed question [41].

Complete turn taking is a technique through which each student is asked to bring a couple of questions to class on a given topic. Questions are in the direction of clarification issues they think were left unresolved, or ideas or positions not yet considered [41]. This activity should involve all students. After all questions were risen, then a class discussion will start. This method allows students to speak and work through some of their concerns.

Respond, React, Reply is a good activity for online class. This is an activity which require a quick response from the students' side based on a given topic, immediately on their own in writing. After each student wrote their answer, the professor will read and share students' response with the group. Each student is encouraged to react to each of the other member's responses. The students also have to reply to each of the reactions to their own response. Within an online environment, the time for each one – respond, react and replay – better to be no longer than 1-2 minutes.

Games based learning refers to the use of *games as a teaching and learning tool in the context of the online learning environment*. Games offer students a fun and exciting way to learn and get involved with a concept or topic. Through elements of scoring, winning and competition (or collaboration), games motivate students to get actively involved and participate in a lesson and, by extension, their own learning [46].

Peer instructions refers to the activity which requires successful students to teach their classmates about certain concepts based on questions or prompts provided by the teacher. After teaching content, a teacher will ask a conceptual question,

known as ConcepTest (multiple-choice questions). Students then have a short period to formulate and provide their answers, often through a survey. Once the results are collected, students are divided into groups and encouraged to share their answers with their peers and, in doing so, convince their peers of the value of their arguments. The aim of this exercise is to provide students with a space to learn from others. This method increases students' understanding and improves conceptual reasoning and problem-solving skills [47].

Peer review is the activity in which the professor is asking students to read, evaluate, and provide constructive feedback on the work of their peers. The aim is for students to engage critically with the work of others and, in doing so, to develop a better understanding of a concept or recognize the gaps in their own knowledge or that of their peers. Peer reviews enable students to gauge or refine comprehension and enhance their ability to analyze, evaluate, and synthesize information [48].

Index Card Pass involve all students' participation. Students are divided into small groups. Each student will write down one question (related to the class) and pass it (online or physically) to another student. Students exchange cards (emails) making at least 4 passes. After that, each student will read the last card (email) received, within their group. The group will decide which question they want to address and then discuss possible answered to the question. This activity encourages students to verify their level of knowledge and at the same time their communication skills.

4.7. Design learning framework for online teaching

The present study presented a comprehensive analysis of how our students may remain focused and actively involved during the class and after. A variety of teaching techniques were also presented. However, a clear timeline related to all these changes' implementation needs it for sure in any higher education institution.

Contemporaneous higher education researchers [49] from Spain and Peru proposed also an ambitious plan for amending the on-campus teaching and learning to online mode. The timeline proposed (Figure 6) can be developed, but in the present research opinion the timing is too tight, having in a view that the whole study plan has to be adjusted to online mode, and professors, academic staff, and students have to get familiar with new technologies used and amended changes in their study plan (especially on teaching, assessments, and evaluation techniques).

An earlier study conducted by Delfino and Persico [50] presents also the need of improving teaching and learning techniques for online education but emphasize the highly flexible course design and a good balance and strict integration between traditional and online training techniques in the delivery of the course and in the assessment of trainees. The authors suggest integrating the online techniques of professor/instructor training program with the existed traditional one.

The present research agreed that has to be a timeline for implementing technical changes, however, program/course online development requires scheduling, organizing, budgeting and review/reporting, as well as goal and strategy setting and risk management. And more important is a course program review for the last minimum 2-3 academic years (which includes the pandemic times too) taking into consideration students, and professors' feedback [21].

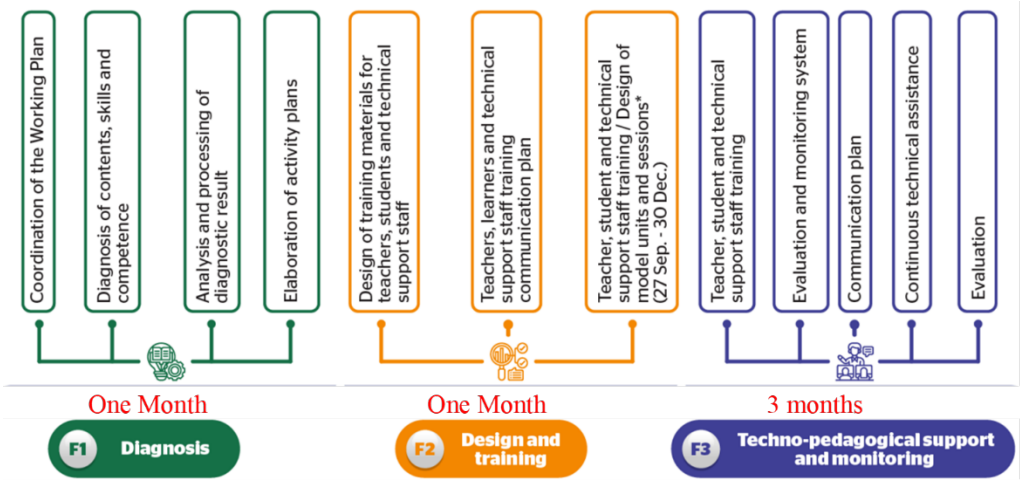

Fig. 6. Timeline to implement the technical changes for online teaching and learning delivery mode [48].

According to with European Commission Analytical Report, the majority of higher education institutions provide support to the teaching and learning process in the form of training and technical support. However, many universities have faced problems with their capacity for delivering online classes in terms of technology, tools, and adapting the curriculum and syllabus to online teaching and assessment mode. Therefore, innovative education techniques such as flipped classrooms, blended learning, adequate assessments with a clear lesson plan, and active teaching and learning techniques should be used to achieve the students' study plan. Mixed methods for teaching and research, together with quantitative data provide qualitative data which help achievements of finance and business administration knowledge and competencies [21]. However, while blended learning in higher education is valued for various reasons such as addressing students' needs for flexibility, blended learning implementation remains a challenging but achievable process for the next academic year [51, 52].

5. Conclusion

Actual movements in socio-economic life around the world impose e-learning and e-presence. Nevertheless, moving digital is more than online teaching, which is changing the environment [53-54]. This research offered an in-depth exploration of the most important dimensions of the teaching and learning techniques, maintaining students' attention and involvement, and challenges facing both, learners, and professors.

As technology continues to reshape industries including the education industry, curriculum, and teaching techniques are looking for ways of optimizing teaching, learning, and assessment. Keeping pace with large-scale digital transformation in a short period of time is challenging for both learners and professors alike. The challenge is not limited to maximizing results, meeting labor market demands for both knowledge, skills, and abilities, but it extends to mastering an entirely new set of technologies to effectively deliver instructions, knowledge, and ultimately competency. Challenges in the online education environment are still persisting and not fading away for both learners and educators. This is particularly true in the face of slow Internet and numerous parts of the world including the developed world as learners struggle to have access to Internet in many developing countries.

Starting from the students' needs and keeping in mind their level of knowledge, in a higher education institution, professors need to create a friendly learning environment in digital learning to be effective in building a rapport [21]. Effective assessment of the knowledge gap between experience, and knowledge of the instructor and students can make a difference in being effective in teaching and achieving learning outcomes.

Professors are encouraged to use different levels of formative assessment to measure students' progress towards learning outcomes. These formative assessments are related to how teachers assess whether their students have mastered content or skills or whether they need additional practice and support. The correct description of students' expectations at each assessment, accompanied by evaluations rubrics, as well as feedback after each assessment makes the learning process transparent, encourages the student to self-evaluate, and requires timely support, and certainly leads to increased academic performance. of the student.

There is something that all of us must not forget: education will always be the primordial need of the entire society. Education brought us and the technology where we are now. We need to continue to find new techniques to maintain a high level of education [16] for all of us in order to be able to face the rapid changes that occurred as a result of digitization and online remote learning and working. The digital age has come with a multitude of promises, in transforming the way people live today, from previous decades. Despite the inequalities in digital-initiated *equality*, developing education systems around the world are coming into contact with digital technology. The previous practice of pedagogues and students is challenged by the new age communication and the educational system based on digital technology [55]. This paper presented teaching techniques that can help overcome the crises that are still living in education by stimulating the active participation of students in the learning process. Now we are moving from traditional academic professors and students to *e*-academic professors and students who conduct all traditional academic activities via electronic means at a virtual higher education institute.

Using active learning and teaching techniques enables the professor to align the learning outcomes with a realistic case study, scenario, and the gap between the minds (professor and student) will be significantly reduced as the gap between theory and practice. However, each professor decides which active learning techniques will use. Nevertheless, the chosen techniques should be suited to the discipline and lesson; aligned with the learning outcomes; encourage all students' participation, collaboration, and critical thinking; allow and promote real-world experience, and be admit or be open to a variety of *correct* answers. Regardless the specialization, using visual, sound effect (cartoons, videos) and games for learning) will always attract students' attention and will help them to understand better the context of the lesson.

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Aims and Objectives

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