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Teaching and Learning Techniques for the Online Environment. How to Maintain Students' Attention and Achieve Learning Outcomes in a Virtual Environment Using New Technology

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Abstract

Digital communication has become vital to all social and economic sectors. Today we are experiencing a transition from traditional learning to e-learning via digital means. Overnight, all of humanity is learning how to adapt to digital life and leaving traditional ways of doing things behind. Digitization has been around for several years, but has become a necessity due to the Covid-19 pandemic. Lockdowns have forced us to work remotely and to use digital networks to communicate, make payments, and learn – all sectors have had to abruptly adapt to the digital age. This paper shows how teaching and learning approaches need to adapt to new communication requirements and students' needs to achieve learning outcomes in a virtual environment. This paper uses both quantitative and qualitative methods to analyze professors' and students' perspectives on the techniques of online teaching and learning, both during the isolation period and after, and what the best methods are for online learning, taking into consideration how to maintain students' attention and how to get them actively involved in the learning process. The aim 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, learning and assessments techniques, higher education.

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Ethical: This study follows all ethical practices during writing.

1. Introduction

The emergence and spread of the Covid-19 pandemic have triggered a major economic and social crisis. In the realm of higher education, the pandemic has brought to light a set of contradictions that has long been present in relation to online teaching, including a tendency towards stagnation in the implementation of new information technologies, and a reluctance to adapt study methods to the needs of students. In the past year, it may be said that the entire education system, at all levels, collapsed due to the effects of Covid-19 lockdowns. Contemporaneous authors are once again underlining the

importance of technology, not only because it gives students access to a plethora of online materials, but because it can also help them study [1, 2].

It is undeniable that the world wide web has become a comfortable place for teaching and learning. Although educators at all levels have accepted the use of online technology as a teaching tool, the methods used for the teaching and evaluation of students' learning in online courses must be examined to determine their real effectiveness. The "digital campus" and online teaching are not new techniques [3]. They have been used successfully by several universities in recent years. However, before the pandemic, online teaching and effectively adapting teaching and assessment techniques to the virtual environment were not a priority. Now, however, it is more than ever necessary to adapt teaching and learning techniques, because there is an ongoing need to provide society with a proper education despite school closures. It seems that the year 2020 was the one in which all educators realized that, while higher education has traditionally been designed and delivered face-to-face, the only learning activities that have endured are those that have been able to move online [4].

The present paper aims to present pertinent methods to maintain students' attention in online teaching. The study focuses on combining the engagement methods with different teaching, learning, and evaluation techniques, specially adapted to online teaching. This paper presents teaching-learning-assessment methods and techniques for use in the online environment, starting from the knowledge of how students' memory and attention operate in the learning process within a virtual environment, and further exploring the 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 the professor uses to organize and implement a series of educational means and activities to achieve certain goals [5]. The chosen teaching methods must correctly reflect the learning process, to ensure that students successfully acquire competencies, knowledge, and skills. Certainly, teaching is much more effective when teaching methods are adapted to new technologies and to students' needs to meet the ever-changing requirements of the labor market. Successful online teaching requires the active involvement of staff, teachers, administrative team members, and students, as well as coordination between various institutional departments, and between institutions themselves.

Academics in the field of education [6] have identified three types of assessment used for business education students: traditional, alternative, and performance based. Traditional assessment usually measures lower-level cognitive skills. These assessments are based on recall and understanding of the facts. Alternative assessments cover the affective domain and include 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 has students demonstrate their proficiency in a skill or task. Examples include formatting documents and completing financial statements.

While many academics and researchers have tried to focus on finding ways for a smooth transition from on-campus teaching and learning to online equivalents, other educators and professors have expressed their concerns relating to the content delivered to students [7]. Earlier, in 2001, Professor Gold 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 students, as well as specialized training in how to foster knowledge acquisition within this new environment [8]. 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 as yet no talk about the value of communication content.

In 2006, a study conducted by professors Lewis and Abdul-Hamid emphasized the importance of the feedback received from students, and the feedback given by professors to students, within the process of implementing online teaching practices [8]. Our research fully supports this view and emphasizes that providing feedback to students is a constructive process that stimulates interaction and involvement, facilitates student learning, and supports the professor to organize and adapt the course study plan according to the students' needs.

In 2007, professors Zapalska and Brozik, in the Finance and Management fields, underlined that individual learning styles must be taken into account in the course design template used for online education [9]. Their paper argues that, once the professor has identified the students' learning styles, an appropriate learning context can be designed. Our research will demonstrate that students' learning styles should be combined with different means of capturing and maintaining their attention. Hung and Zhang [10] analyzed online behavior to investigate the achievement of learning outcomes. We strongly agree with them that student behavior helps educators to develop teaching, assessment, and evaluation techniques. However, memory, focus, and students' feedback should be taken into consideration too, as will be presented here.

A group of researchers from the School of Management, Science and Engineering, Central University of Finance and Economics, Beijing, China [11] stated that cross-disciplinary and cross-curricular teaching and learning models have become the new focus of education development. As a typical interdisciplinary specialty, most construction management curricula have started to gradually introduce innovative teaching methods, such as workshops, reverse classrooms, and peer training. However, the internal application of these teaching methods has not led to a systematic system of evaluation. Therefore, the authors have observed a clear need to amend current educational approaches. In recent years, 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 the teaching of finance and business management promise a universe of applications and digitalized assets that are expected to work together to allow the rapid development of new capabilities that will give a competitive advantage and equip a new generation of students with employment-ready skills [2, 12-15].

Technological innovations such as blended learning are rapidly changing the higher education teaching and learning system [16, 17]. The main activities of higher education are related to research and teaching, knowledge transfer through work-based learning or industry-oriented activities, and applied teaching and the development of digital skills using the newest digital technologies [18, 19].

One key question has emerged among teachers and students *Is this is how the education system will go forward from this moment – online?* Lately, there have been many debates about the quality of online versus face-to-face teaching and learning. These discussions focus specifically on issues related to professors' engagement, resources, assessment, and skills, and their preparedness to provide effective online learning [20]. One thing is certain, society is evolving to become more digitized, and education must adapt. Online teaching will become common practice from now on. It is true that the experience of teaching and learning on campus cannot be compared with the online experience. The interactions are different, and the student-professor rapport is more active within an on-campus environment. However, online education is already established, and it is here to stay, whether fully online or blended. Moreover, the practical approach presented in the 21st century academic study plan enables practitioners to participate in a large number of blended courses, helping educators and students to bridge the gap between theory and practice.

3. Research Methodology

The research is based on three main areas of interest: the gap between the minds and how to capture students' attention; flexible teaching techniques that are centered on student learning; and teaching, learning, and assessment methods appropriate for the online environment. To investigate these issues and achieve the research objectives, this study has used the data and results of previous research developed by the same author [21].

To answer the research objectives, the study adopted an interpretative qualitative research method [15]. Other academics have underlined that interpretivism recognizes that social phenomena must be understood in the social contexts in which they are constructed and be guided by the way people interpret and understand situations [22, 23]. For this study, the qualitative research method was considered the most appropriate, as it crosscuts disciplines, fields, and subject matters [24].

The chosen qualitative research method is thus based on relationship skills and empathic listening, which the author used to unsure the participants were more willing to offer truthful explanations for their views.

The research started in early 2020, when the world was faced with the Covid-19 pandemic. The research was carried out through successive interviews with representatives of higher education institutions, students, and professors in the field of finance and business management. The interviews focus on 1) students' ability to adapt to the online teaching and learning process, to actively participate in each course, to demonstrate a comprehensive understanding of the subject matter, and to prove their successful acquisition of knowledge, skills, and competencies, in line with the objectives of the course and program of education; and 2) teaching and learning techniques and the relevance of assessment methods appropriately modified for online delivery modes, student-centered learning, and professor-student rapport in the virtual environment.

The analysis helped achieve an understanding of the importance that must be assigned to the achievement of course/program learning outcomes; the need to adapt teaching, learning, and assessment techniques; and the application of different approaches to maintain student-centered learning.

4. Research Findings

4.1. How Memory Works and How to Capture Students' Attention

The efficiency of the educational process is also determined by the method through which the optimal teaching approach is identified, and depends on the students' ability to understand the topic in question. It is also crucial to understand how students' learning takes place, which correlates with the teaching approach chosen by the professor.

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. Memory also provides individuals with a framework for making sense of the present and the future. In other words, 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 to ensure that the chosen teaching methods are as effective as possible at reaching students. It is necessary that every educator understands how human memory works, as this is the foundation of students' understanding and performance. The paper will provide a brief review of the cognitive processes that allow problem-solving, encoding, recall, retention, and memory retrieval, see Figure 1. Thus, each educator can have a better understanding of how learning works and how teaching methods should be adapted to facilitate students' learning and understanding. Generally, there are three main processes that characterize how memory works: encoding, storage, and recall [25].

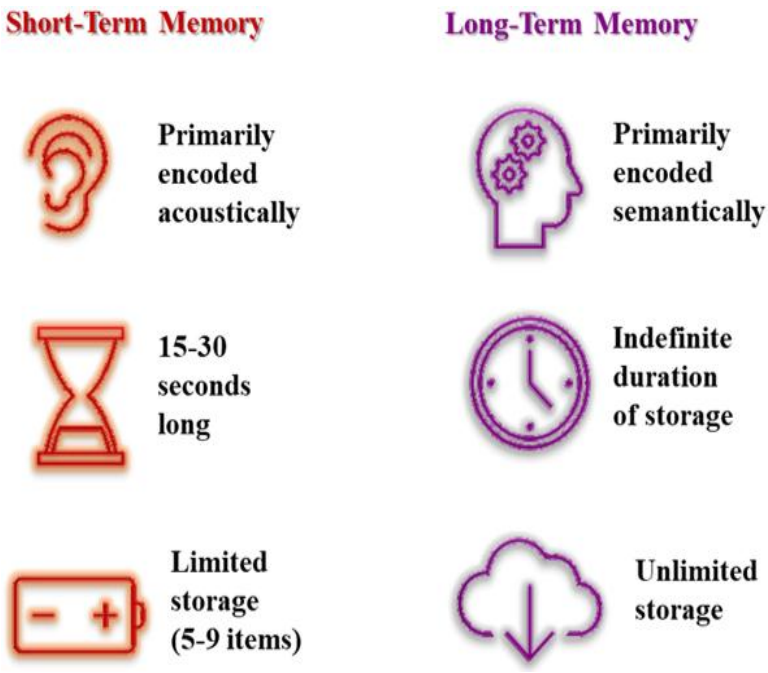

Figure-1.
Memory and learning process.

Encoding refers to the process by which information is learned, i.e., how information is retrieved, understood, and modified to better support storage. The information is usually encoded by one (or more) of 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 facets of long-term memory, while acoustic and tactile coding are characteristic of 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 retrieved differently depending on how it was stored (short term or long term). While short-term storage is retrieved in the order in which it was stored, long-term storage accessed by association Roediger and McDermott [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 knowledge in the long term and to be able to implement it in their work or further professional development, they must offer information that is first encoded visually (short videos, graphics, educational games) and then 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 all 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 *the gap between minds*. Each educator should be aware of what they know and what the students know, and then take appropriate steps to reduce this difference. The teaching and learning techniques employed must also aim to reduce the gap between minds. The literature has identified four main factors associated with the gap between minds: mental state inference, the curse of knowledge, hindsight bias, and egocentrism.

Figure-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 we know what others think and feel? Because we lack access to other people's minds, we need to do our best to guess what they are thinking based on the information we can observe. As educators, we must use a range of information to deduce our students' mental states. This information relates to students' physical behavior, as well as the ability to put ourselves in their place and imagine what we might think in their situation [28, 29]. As a professor, recognizing our assumptions about what determines the behavior (and performance) of students can help to shape the way the teaching is delivered, to better support students' learning and understanding. This can be done by employing 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 a high level of knowledge about a subject may affect a person's ability to effectively predict how much knowledge others have. This phenomenon has some important consequences. From an educational point of view, the most important consequence is the difficulty of sharing knowledge with others [30-32]. There are cases in which the professor, who has extensive knowledge of the subject he teaches, and who may also have practical experience in the field, could encounter difficulties in finding an appropriate way of teaching and of understanding the students' perspective, who, compared to the teacher, are usually novices in the field. Therefore, professors can struggle to explain concepts to their students. In other words, because the professor knows a concept so well, he has a hard time imagining what it is 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 the students [31]. As an educator, it is very important to recognize the *curse of knowledge* phenomenon and to prepare the lesson plan from the perspective of the students.

Hindsight bias has implications for students' 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 that was going to happen,* or *I knew it all along*? This feeling is known as hindsight 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 the excessive simplification of events (seeing their cause and effect as more predictable than they are), making incorrect decisions, or developing (and promoting) a unilateral or biased view of events and information [33].

Egocentrism refers to the inability of an individual to consider the perspective of others. As is evident from the previous discussions of the curse of knowledge and hindsight bias, being unable or unwilling to analyze and incorporate student perspectives can block a 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 would do well 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 easily distracted from class, especially within an online teaching environment, see Figure 2. There are two types of motivation that may influence how students can be engaged in the learning experience: intrinsic, which refers to the motivations that originate internally; and extrinsic motivation, which refers to external factors that influence student performance and motivation. Bain [34] identifies numerous evidence-based strategies that teachers can use to motivate their students. Eight of these strategies are listed in Figure 3.

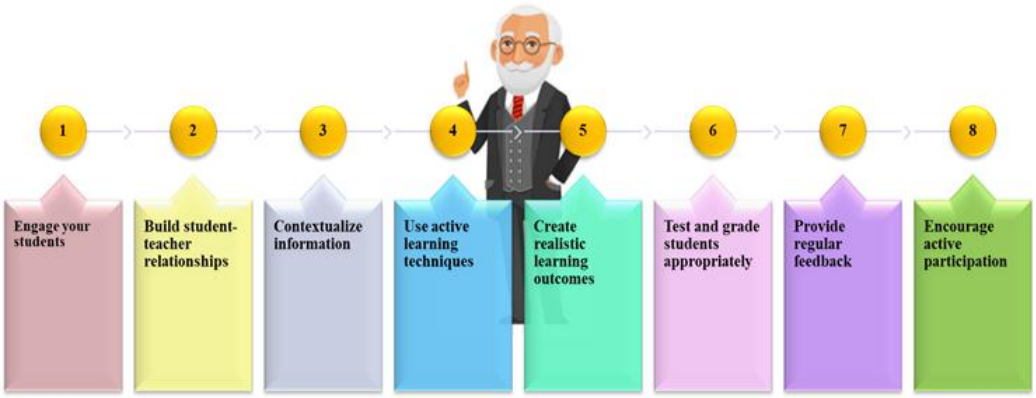

Figure-3.
Strategies used to encourage students' attention, motivation, and performance [34].

4.3. Teaching Techniques to Improve Recall within the Online Environment

The efficiency of the educational process is determined by the optimal teaching approach, and depends on the students' ability to understand the topic in question. It is also very important to understand how the students' learning process takes place, because it will help choose the teaching approach.

It is important for every educator to be aware that the chosen teaching techniques must promote students' retention and remembrance. In education practice, there are three main techniques: testing, spacing, and intercalation.

Testing. In most cases, tests are used for periodic evaluation. Periodic testing before or during class (the one-minute paper) helps professors understand how well their students have learned the material. At the same time, frequent tests are considered one of the best ways to learn in the first place.

Active and frequent testing helps the memory retention process when learning something new. By actively and frequently testing, students are encouraged to regularly recall the information they have recently learned, which helps them to store the information in their long-term memory, from whence they can use it at a later stage of the learning experience [26]. Active testing can take place during teaching time (at the beginning, middle, or end of class) through a one-minute paper, a short questionnaire, a free-answer question, or asking students to remember what they learned that day or the day before. At the beginning of a class, testing will be about a previous lesson or the material the student was supposed to read for the present class. In the middle of a class, testing may concern new topics or information presented during the class. At the end of the class, testing will concern the main ideas and concepts learned during the class. Within an online environment, *questions can be provided via MS Forms, requesting a short (one to five minute) answer*. Tests can take the form of 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 concepts of the previous course, to make connections with the topic of the current course and the next one. Instead of introducing students to a new topic and its related concepts in a single session, the professor is encouraged to cover the topic in segments over several lessons [26]. Moreover, it is helpful to incorporate *visual and or sound effects* by adding cartoons to the lesson materials, including *short videos*.

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

4.4. Learning Techniques to Improve Recall

As presented above, it is important for every professor to know which techniques can be used to improve students' recall of information. 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 for this study, but also based on a review of previous literature 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 first learned the information allows you to better remember that information. The state refers to an individual's environment, as well as his mental and physical state at the time of learning [35].

Schemas refer to the mental frameworks that an individual creates to help him to understand and organize new information. Schemes, graphs, and colors can act as a cognitive quick command by allowing individuals to interpret new information much faster [36]. However, excessive use of schemas can prevent students from learning relevant information that does not fall within the scope of the schema that was created. Students must be taught how to create a schema, what

information a schema should contain, 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. Each lesson plan must incorporate this technique. The information is delivered in groups. Thus, students, instead of remembering each individual topic, remember the whole group and can then more easily take on each topic within that group [37, 38]. Chunking facilitates better memory recall by separating information into small groups that are easier to remember and helping students to identify patterns. Understanding patterns and principles will boost retention.

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

4.5. Designing Learning Frameworks for Online Teaching

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

Multiple means of representation through which information can be presented to students. This 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 the teaching methods used to ensure that all students have access to the ways concepts and ideas are emphasized, connections are made, and questioning is modeled [39].

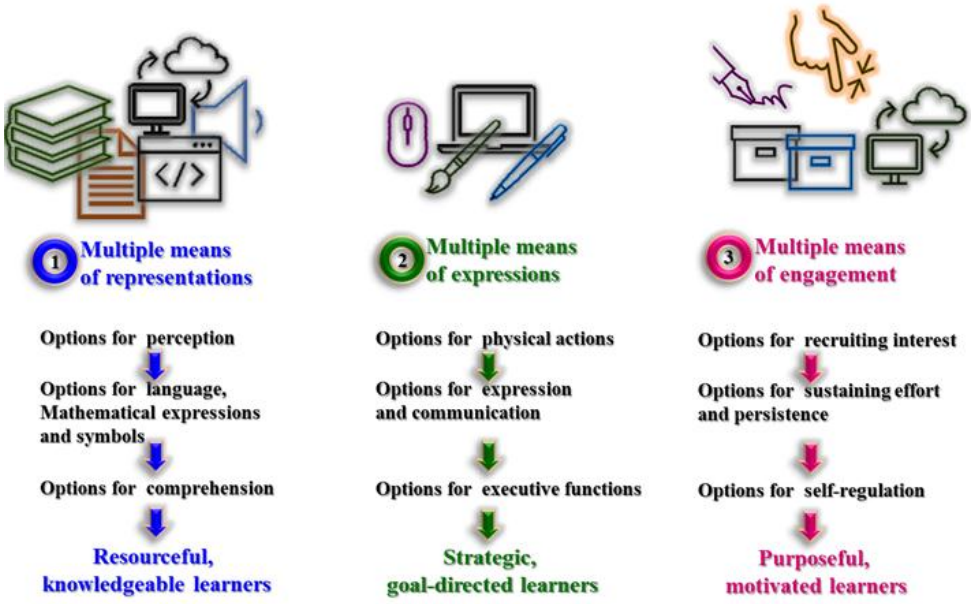

Figure-4.
Principles of designing the learning framework.

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 in the way they feel most comfortable [39].

Multiple means of engagement include the different ways in which students may need or choose to become involved in the learning experience. This can determine their motivation to learn [39]. This motivation can be internal and external. In this context, there are three general themes that determine how to what extent 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 Recall

A study conducted under the European Union's Erasmus program very clearly defines the concept of active learning. Active learning is described as an approach to instruction that involves actively engaging students with the course material through discussion, problem-solving, case studies, role play, and other methods.

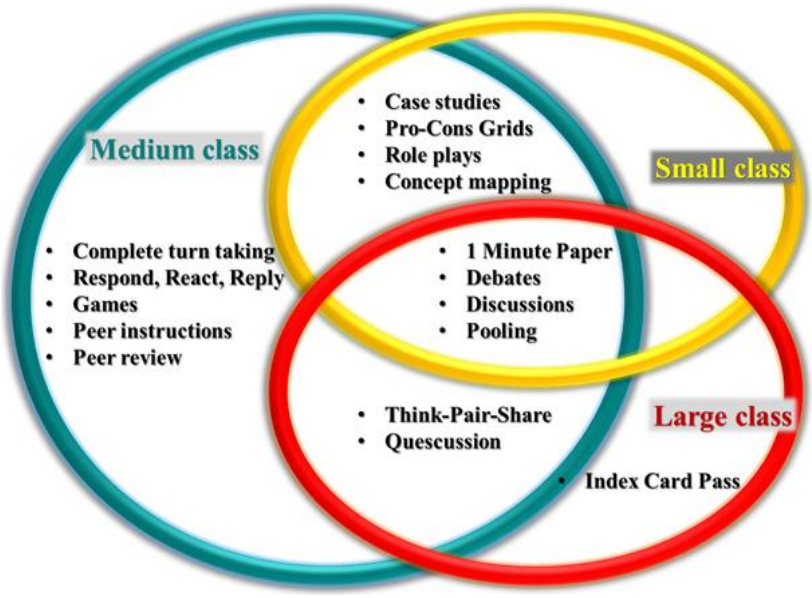

Figure-5.
Teaching techniques for active learning.

In the case of online teaching and learning, depending on the platform used, the professor can create discussion sub-forums and sort students into teams or smaller groups, choosing different techniques (from those shown above, in Figure 5) to respond to the assignment. Once students have summarized their answers in the smaller groups, they can post their answers on a larger forum where all students can read and comment on their colleagues' answers.

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

Certainly, the students' motivation equally depends on the subject being taught and on the way the teacher engages the students during the lesson. At the same time, the way students are engaged in the teaching process depends on the size of the class – small, medium, or large; on the delivery method – face-to-face, blended or online; as well as on their background or prior knowledge. Examples relating to their knowledge and background, real-life examples, analogies with current cases, storytelling, or asking students to solve activities by applying the knowledge gained may certainly help. Below are some examples of active teaching techniques which can be used for face-to-face classes, as well as being 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 multiple-choice questions using a telephone, computer, or a portable clicker (also known as a personal answering device). In addition to multiple-choice questions, many online tools allow 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 students covered before class, or to any topic related to the current course. The answers must be concise. The answers are sent in according to the specified type, whether online or in-person in class. The answers are collected and commented on 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 lesson, including lectures. A particularly effective strategy is to ask each student to first answer the question independently, then discuss the question with a colleague, and then vote again on the correct answer.

Some of the most-used active teaching techniques aimed at engaging students are 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 the content.

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 (higher-order) thinking skills, as students are asked to make immediate, intellectual remarks in response to arguments from the opposing team or student [40].

The purpose of a ***discussion*** is not for students to discuss a topic (as opposed to a debate). Rather, 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 create a space for collaboration in which students learn from each other [41].

Case studies represent a great opportunity for students to work on the practical applications of theoretical course materials. This activity provides students with a real-world case to study (from 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 be studied in teams or individually. The students' analysis is then presented to the entire class in the form of individual or group written answers. In the case of in-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. It requires students to weigh competing statements and concerns. The topic is usually provided by the professor, and students are encouraged to make a list of pros and cons or advantages and disadvantages for that topic.

Role play is an active teaching and learning technique through which students take on and act out roles in a case-based scenario. The role play can be carried out one-on-one (individual role play) or as a group role play in which each member of the group takes on a particular role/character. Roles and rules for a role play are clearly defined in the script. Role plays can help students achieve various learning outcomes, practice skills such as teamwork, negotiation, and decision-making, roles such as employer, supplier, client, etc., or assume the role of another person to understand their point of view [42]. In the case of role-play activities, clear guidelines should be provided by the 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 map 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, their higher-order thinking skills.

Think-Pair-Share is an active learning technique that involves three main steps: *Think* – reflect on the answer to the question, ideally in writing; *Pair* – partner up with another student to discuss the response; and *Share* – discuss the response with the group and then share it with the class to conclude the assignment. This technique is recommended for both face-to-face and online groups, with a clear time limit 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). This gives students practice synthesizing information as well as presenting.

Quescussion refers to a learning technique that involves discussions conducted only through questions. Given a specific topic, students may only respond or add to the discussion in the form of questions. This is a form of informal learning which gives students the possibility to actively involve their creativity and judgment skills. By getting students to ask questions, they are invited to generate a variety of thoughts on the topic without directly stating their own views. With each question, students will likely think of answers to the proposed question.

Complete turn-taking is a technique in which each student is asked to bring a couple of questions to class on a given topic. The questions are meant to clarify issues that students think were left unresolved, or ideas or positions not yet considered. This activity should involve all students. After questions have been raised, 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 classes. This is an activity that requires a quick written response from the students' based on a given topic. After each student has written their answer, the professor will read and share students' responses with the group. Each student is encouraged to react to each of the other students' responses. The students must also reply to each reaction to their own response. Within an online environment, the suggested time for each phase – respond, react and replay – is 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 them involved with a specific concept or topic. Through the elements of scoring, winning, and competition (or collaboration), games motivate students to get actively involved and participate in a lesson and, by extension, in their own learning [43].

Peer instruction is an activity that requires successful students to teach their classmates certain concepts, based on questions or prompts provided by the teacher. After teaching the content, the teacher will ask a conceptual question, known as *ConcepTest* (multiple-choice). Students then have a limited time to formulate and provide their answers, often through a survey. Once the results have been 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 the opportunity to learn from others. This method increases students' understanding and improves their conceptual reasoning and problem-solving skills [44].

Peer review is an activity in which the professor asks students to read, evaluate, and provide constructive feedback on the work of their peers. The aim is to engage students to critically analyze the work of other students and, in doing so, to develop a better understanding of a concept or recognize the gaps in their own or their peers' knowledge. Peer review enables students to gauge or refine their comprehension and enhance their ability to analyze, evaluate, and synthesize information [45].

Index Card Pass involves the participation of all students. Students are divided into small groups. Each student will write down one question (related to the given topic) 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 with the class and then discuss possible answers to the question. This activity encourages students to verify their level of knowledge and at the same time hone their communication skills.

4.7. Designing a Learning Framework for Online Teaching

This paper presents a comprehensive analysis of the ways in which students may be kept focused and actively involved during and after class. A variety of teaching techniques has been presented. However, a clear timeline for the implementation of these changes needs to be specified.

Contemporaneous researchers [46] from Spain and Peru have proposed an ambitious plan for transitioning from on-campus teaching and learning to the online mode. The timeline proposed in Figure 6 might be implemented. However, the opinion of the present research is that the proposed timing is too tight, given that the entire study plan must be shifted to online mode. Professors, academic staff, and students have to familiarize themselves with new technologies and changes to their study plan (especially in terms of teaching, assessment, and evaluation techniques).

A study conducted by Delfino and Persico [47] has also noted the need to improve teaching and learning techniques for online education and emphasized a highly flexible course design. The authors underlined the necessity of achieving a good balance and strict integration of traditional and online training techniques in the course delivery and the assessment of trainees. The authors suggested integrating the online techniques of professor/instructor training programs with the existing traditional ones.

The present research agrees that a timeline is required to implement the technical changes. Nevertheless, the development of online programs/courses requires scheduling, organizing, budgeting, and review/reporting, as well as goal and strategy setting and risk management. And even more important is a review of the course program of at least the last 2-3 academic years (including the pandemic years) taking into consideration the feedback from students and professors [22].

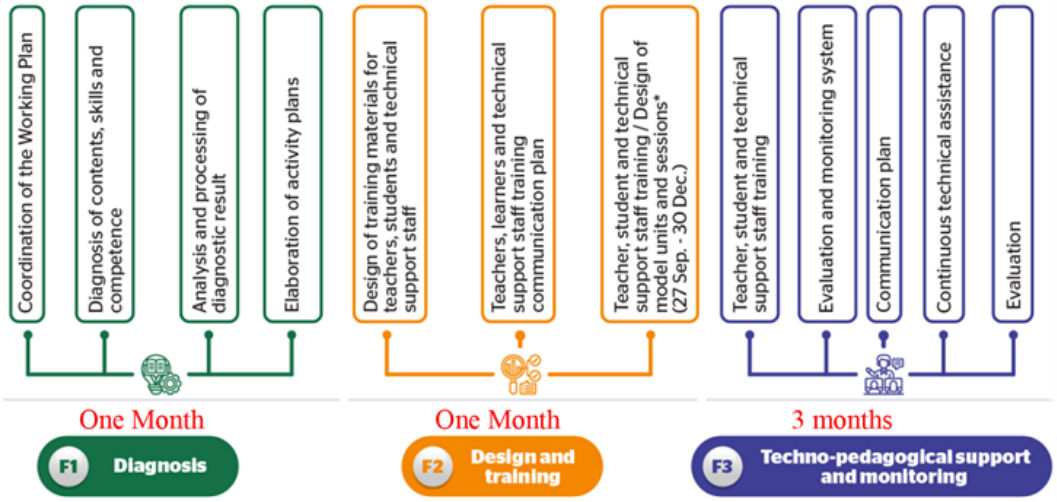

Figure-6.
Timeline to implement the technical changes for online delivery of teaching and learning [46].

According to the European Commission Analytical Report, most institutions of higher education support the teaching and learning process with training and technical assistance. Yet many universities have faced problems with their capacity to deliver online classes, in terms of technology, tools, and adapting the curriculum and syllabus to online teaching and assessment. Therefore, innovative education techniques, such as flipped classrooms, blended learning, adequate assessment with a clear lesson plan, and active teaching and learning techniques should be used to achieve students' study plans. Mixed methods for teaching and research, together with quantitative and qualitative data, may help students achieve the finance and business administration knowledge and competencies required by the respective curricula [22]. Still, while blended learning in higher education is valued for various reasons, such as addressing students' need for flexibility, the implementation of blended learning remains a challenging but achievable process for the next academic year [48, 49].

5. Conclusion

The realities of socio-economic life around the world have led to an increase in e-learning and e-presence. Moving online is about more than online teaching, and is changing the environment [50]. This research has offered an in-depth exploration of the most important teaching and learning techniques to maintain students' attention and involvement, as well as the challenges faced by learners and professors.

Technology continues to reshape all industries, including education. Now, educators are looking for solutions to optimize teaching, learning, and assessment techniques. Keeping pace with the large-scale digital transformation, it is challenging for both learners and professors to adapt in a such short period of time. The issue is not limited to maximizing results or meeting labor market demands for knowledge, skills, and abilities. The challenge is to master an entirely new set of technologies and to effectively deliver instruction, knowledge, and ultimately competency. Struggles in the online education environment are persistent and are not fading away for either learners or educators. This is particularly true in areas of the world with internet connectivity issues.

Starting from the students' needs, and keeping in mind their level of knowledge, professors need to create a friendly digital learning environment and to be effective in building a professor-student rapport. Effective assessment of the

knowledge gap between the experience and knowledge of the instructor and that of the students can make a difference in being effective in teaching and helping students to achieve learning outcomes.

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

There is something we must all keep in mind: education will always be a primordial need of the entire society. Education has brought us, and technology, to where we are now. We need to continue to find new techniques to maintain a high level of education [14], in order to be able to face the rapid changes that are occurring as a result of digitization and online remote learning and working. The digital age has come with a multitude of promises, transforming the way people live today. Despite the inequalities inherent in digital-initiated *equality*, developing education systems around the world are encountering digital technology. The previous practices of pedagogues and students are being challenged by the new age of communication and by the digital technology-based educational system [51]. This paper has presented teaching techniques that can help overcome the crises that are still extent in education by stimulating the active participation of students in the learning process. 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 institution of higher education.

Active learning and teaching techniques enable professors to align the learning outcomes with realistic case studies and scenarios. The gap between the minds will be significantly reduced, as will the gap between theory and practice. However, each professor decides which active learning techniques to use. Nevertheless, the chosen techniques should be suited to the discipline and the lesson, aligned with the learning outcomes, encourage the participation, collaboration, and critical thinking of all students, allow and promote real-world experience, and be open to a variety of *correct* answers. Regardless of the field of study, the use of visuals, audio, and games for learning will always attract students' attention and will help them to better understand the context of the lesson.

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