

NEW TRENDS AND RESEARCH ON DIGITAL EDUCATION, TECHNOPELAGOGY AND CURRICULUM



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Dykinson, S.L.

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CHAPTER 8. NEW REALITIES ON TOURISM STUDIES TEACHING: BRIDGING THE VR GAP BETWEEN RESEARCH AND PRACTICE BASED ON EMPIRICAL EVIDENCE

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I. Introduction

The Virtual Reality (VR) technology consists of “using a computer-generated 3D environment, that the user can navigate and interact with, resulting in real-time simulation of one or more of the user’s five senses combining visualisation, immersion as well as interactivity” (Yung & Khoo- Lattimore, 2019, p.2).

As VR gains interest in several sectors, the number of applications and implications in the tourism activity also increases, as well as their significance. This includes issues such as planning and management, marketing, entertainment, accessibility, heritage preservation as well as education. However, there is still a significant gap between research and practice concerning VR tourism- based utilities given the need to adapt the

current academic curricula related to Tourism Studies (Loureiro et al., 2020) so that future tourism professionals can take advantage of these VR potentialities.

On the other hand, academic literature states that integrating VR technology in Tourism Studies teaching increases the efficiency of knowledge building and thus cultivates students' comprehensive professional qualities, capabilities as well as abilities (Wei, 2021).

Regarding this, the main goal of this work aims at bringing empirical evidence along a VR- based experimental teaching experience. This experience provided Tourism Studies alumni with a virtual experimental space to enhance its operational functions within the current academic curricula and the fulfilment of the future needs that the tourism sector will demand from future professionals in both public and private sector.

To achieve the goal of this research, a pioneer teaching initiative has been conducted including VR technology for a total of 102 students in a high education institution from undergraduates in Tourism, combining practical applications of VR based on a multidisciplinary approach: tourism management and planning, tourism marketing as well as tourism economics.

A questionnaire was applied to measure the evaluation of VR technologies to guarantee the development of a series of comprehensive professional qualities, capabilities and abilities so that the professional performance of these students meets with the future requirements of the tourism sector.

This research brings practical implications and suggestions for knowledge building in high education institutions as a means of bridging the gap between research and practice of VR integration in the tourism sector.

II. Theoretical approaches and literature review

Digital transformation is a reality that has become embedded in all processes of society (Muwani et al., 2022). The constant growth of technology makes convergence channels are established in a fluid way between the usual processes of life and the new scenarios that already start from a digital content. Thus, society participates in digital resources that are responding to the demands made and the needs and concerns that arise. In response to this fact, one of the digital tools that has been introduced is the so-called Virtual Reality (VR) defined by authors such as Lopreiato et al. (2016) as "Simulations that use a variety of immersive, highly visual, 3D characteristics to replicate real-life; virtual reality simulation is distinguished from computer-

based simulation in that it generally incorporates physical or other interfaces such as a computer keyboard, a mouse, speech and voice recognition, motion sensors, or haptic devices” (p. 40).

The scientific community shows the diversity of VR applications in different fields, where there is a perfect conjunction between science and technological development, raising new realities, from psychology (Díaz and Flórez, 2018), medicine (Ávila-Tomás et al., 2021), architecture (Martínez, et al. 2021) and in education (Begazo, 1999). In addition, it is helping, not only to acquire knowledge, but also to become imbued with it (Bower et al., 2020; Luo et al., 2021).

Based on these contributions, an analysis is established according to three key factors to that support the progress of VR in the training processes applied to education; the first is the technological development of the institution, in this case it is estimated the degree of commitment and interest that the centre has for the application of technology in the training processes of its educational community and, on the other hand, the degree of digitization of the management processes of the centre itself. The second factor is the digital competencies and skills of teachers, where the new "technoeducational" paradigms require teachers to have a certain level of digital competencies (López, et al., 2019). These competencies and their application in the processes of teaching and learning that have VR as a tool are still extremely limited. In some cases, the introduction of training innovation projects is motivated by educational research that, with inter-administrative support, is helping to introduce changes in the training processes of teachers and students. Finally, the third factor is the development of content and technological tools that make possible VR-based initiatives contribute to the achievement of the proposed educational objectives.

In this context, the model of a digitised higher education defines a competitive university that thrives in improving education by developing technological habits, also oriented to be dynamic and motivating education (Barrera & Guapi, 2018). Thus, we see an example in the impact of simulators with VR in learning that become, as a training tool, an experience to the student of great value and significantly increases learning outcomes (Mariscal, et al. 2020). In addition to this, one of the main challenges of VR is the challenge of creating didactic content for VR that involves, beyond the student and the teacher, the need to have specific equipment to generate such content to achieve the desired learning outcomes. It is also necessary to have the necessary tools to ensure optimal immersion, which entails costs

(glasses, audio helmet, gloves, etc.) that can limit its use as a training tool. In any case, these limitations will not put an end to what authors such as Cabero and Barroso (2018) point out as a pedagogical change in the way of teaching that is fostering real experiences and activities focused on deeper and more interactive learning.

Regarding Tourism Studies, it is important to note that the tourism sector is undergoing a revolution brought about by the introduction of technology, including VR, which will have a great impact on tourism operations as it will help in the marketing of experiences (Alonso, 2019). This fact encourages a rapprochement between tourism and VR as it is one of the most powerful technologies to be applied along the whole value chain of destination, and thus, with a high potential in high education as well (Fan & Wang, 2012; Liu et al., 2020; Wei, 2019, 2021).

From this perspective, this chapter will present three case studies that aim at bridging the VR gap between research and practice in Tourism Studies.

III. Practical experience / Empirical experience

3.1. Sample of the work

The sample of this work contains a total of 102 undergraduate students of the Tourism Studies area. Specifically, 39.2% of the students were enrolled in the course on Planning of Sustainable Tourism Spaces; as well as 60.8% of the students were enrolled in Commercial Management and Tourism Marketing (30.4% of the sample) or Organization and Business Management courses (30.4% of the sample).

3.2. Questionnaire design and data collection

A questionnaire was designed to measure the evaluation of VR technologies to guarantee the development of a series of professional qualities, capabilities and abilities so that the professional performance of these students meets with the future requirements of the tourism sector. This questionnaire contains a total of 21 items based on a 6 points Likert-Scale, where 0= Strongly disagree and 5= Strongly agree.

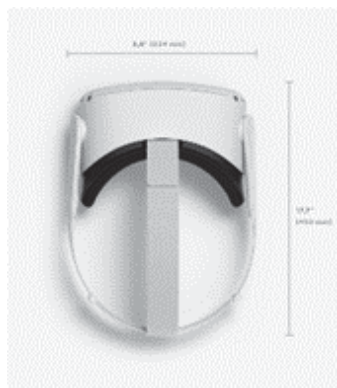
3.3. Used resources based on VR-technology

The following resources were necessary for the development of the VR-based activities:

- Glasses: Meta Quest 2. Thanks to the six degrees of freedom technology, these glasses track the movements of both the head and the body and integrate them into the virtual reality with realistic precision. No external sensors are required. The virtual glasses have a fast-switching LCD display, a resolution of 1832×1920 resolution in each eye and a supported refresh rate of 90 Hz (figure 1).

Figure 1.

VR glasses: Meta Quest 2.



Source: own elaboration.

- Spatial.io. This application recreates an office where people gather around a table and discuss different topics. It can be used by people in different geographical locations and recreates the feeling of being in the same physical space. The application allows the use of various tools, such as sticky notes to sort the information.
- Google Earth. This application allows you to travel and learn about the world with a virtual globe. You can view satellite images, maps, terrain, 3D buildings, among others. Google Earth images include information available from a wide variety of providers, including public, government and commercial sources.

- A compatible computer from which the computer applications can be controlled and an expert in this type of virtual device can monitor the smooth running of the activity.
- Two practice rooms. In one of them, the virtual experience is conducted individually. In the other, group discussion and reflection on the activity conducted takes place.

3.4. Commercial Management and Tourism Marketing through VR-based learning

The practice has been conducted as an activity of the subject Commercial Management and Marketing corresponding to the 2nd year of the Degree in Tourism. The contents and competences of this subject refer to the marketing tools taught by the universal teaching community, that is, the "4Ps" of Marketing: product, price, communication and distribution.

Thirty students participated in the practice and the duration of the course was 6 classroom hours, to which must be added the non-classroom work at home.

As will be explained below, the students are organised into discussion groups and conduct a group reflection on the experience carried out.

The main objective of this activity was to describe and explain the marketing strategies conducted by establishments located in Sierpes Street in Seville (Spain). For this purpose, a virtual visit to the street was conducted, during a determined time and individually. It should be noted that Calle Sierpes in Seville is a pedestrian crossing where many of the major national and international brands and other local establishments are mixed. It is the most important and well-known shopping street in Seville. It should also be emphasised that the virtual experience cannot be carried out inside these establishments since the application used, Google Earth, does not have permissions to access them, so the practice is based on the information that students can view virtually walking down the street.

The activity/practice took place at the end of the course period, at which time the students have acquired most of the knowledge and skills.

3.4.1. Developed skills and competencies

Students who successfully completed the internship worked on the following competencies:

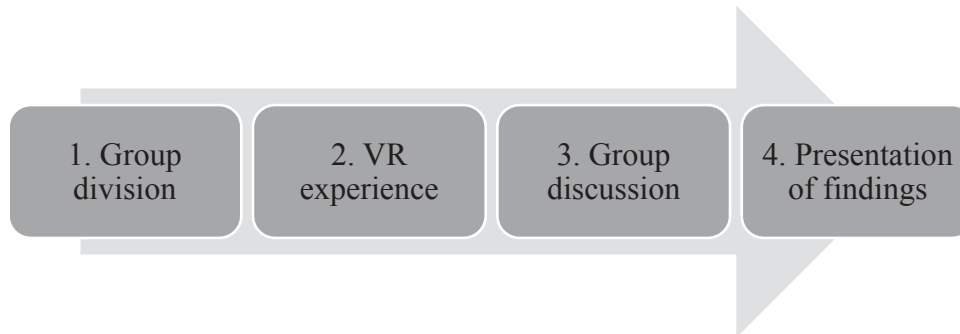
- Capacity for analysis and synthesis.
- Organisational and planning skills.
- Computer knowledge related to the field of study
- Information management skills
- Proactively manage their learning process in the field of business management.
- Plan and develop innovative actions in the professional practice in the field of commercial management.
- Possess and understand knowledge of Commercial Management that is supported by textbooks with some aspects involving knowledge from the forefront of their field of study.
- Differentiate the commercial function in the company.
- Know and use different marketing strategies:
 - Pricing strategies.
 - Product strategies.
 - Distribution strategies.
 - Communication strategies.
- Communicating information, ideas, problems, and solutions in the field of commercial management in an adequate and effective way.
- Solving commercial case studies in work teams.
- Use commercial terminology in a correct way in the realisation and presentation of works and projects.

3.4.2. Milestones of the activity

A total of four phases were developed within this activity (figure 2):

Figure 2.

Milestones of the course on Commercial Management and Tourism Marketing through VR experience



Source: own elaboration.

1st Phase: Group division: The group is formed by 30 students divided into 10 subgroups of 3 students. The teacher should try to form the subgroups as homogeneously as possible, taking into account the theoretical contents already taught.

2nd Phase: Virtual experience. Each student develops his experience individually in the room provided for this purpose, having 10 minutes to observe and tell his experience to the other students in his group who will accompany him taking the notes they consider necessary for the resolution of the practice.

3rd Phase: Group discussion. After each student in the group exhausts his viewing time, the whole group will go to the classroom for discussion and reflection of the virtual experience. The duration of this phase is 30 minutes.

4th Phase: Presentation of findings. In this phase each subgroup of students will carry out the practice by detailing in writing the different marketing strategies observed virtually. It was carried out in a non-presential way, and the task will be delivered online through the Virtual Campus to be corrected by the teacher.

The development of this practice has led to a series of improvements in the teaching/learning process. Firstly, the students have connected with a technology tool such as VR, for which they are properly prepared, although not well trained. Secondly, the teachers have used a reality that, although

virtual, is more real than the one developed with traditional tools, so the incorporation of these new tools seems essential.

Another key aspect for the formative development of the students is the increase in their organisational and planning capacity, both at the individual and group level, since the practice requires a very didactic reflection both in its execution and in its exposition. For his part, the teacher participates in the experience more as an observer guide than as a traditional teacher, which is an incredibly positive professional incentive.

It should also be emphasised that the teaching innovation materialised with the VR glasses is something simple to apply in this subject, marketing. In fact, the marketing teacher finds a more friendly and pedagogical space to explain the contents of this subject by developing his practices with students in a virtual environment.

Finally, although the applications of VR are being especially important in different areas and sectors, its implementation and development in the tourism sector is especially noteworthy because of the relationship it currently has with the experiential marketing strategy.

3.5. Organization and Business Management through VR-based learning

The activity is associated with the subject "Organization and management of companies" at the first year of a Tourism degree, specifically, with the subject of decision-making in the area of human resources.

Thirty students participated in the activity, divided into three groups of ten members each. Each group had a total duration of three hours: one hour of individual preparation, one hour in the virtual classroom and one hour of group discussion. Each group conducted the activity in the virtual classroom separately, but the subsequent group discussion was held jointly.

The aim of the activity was to evaluate the usefulness of a virtual office as a tool for business decision-making between people in different geographical locations.

To this end, a script was provided for the simulation of a business situation in which a decision had to be made. The proposed scenario is an event organisation company from the Region of Murcia that after five years of experience decides to open a branch in Madrid to expand its market. To do

so, they have to hire a person responsible for this new office. The tasks to be conducted and the qualifications and skills required are explained in the practice statement and the profile of three candidates is presented. The students in the virtual office represent a meeting of the human resources area of that company in which they have to identify the pros and cons of each of the candidates, distinguish their hard and soft skills and choose the most suitable candidate.

The activity was carried out at the end of the second term, after having taught the theoretical contents related to this subject, when the students have acquired most of the knowledge and competences.

3.5.1. Developed skills and competencies

Students who successfully completed the activity worked on the following competences:

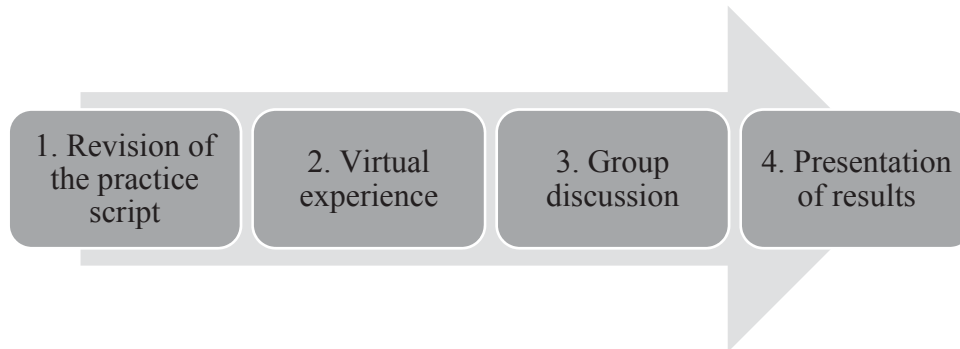
- Analysis and synthesis skills.
- Computer skills related to the field of study.
- Information management skills
- Proactively manage their learning process in the field of business decision making.
- Identify the hard and soft skills of a personal profile
- Evaluate the suitability of a job profile for a job position
- Communicate effectively and appropriately information, ideas, problems and solutions in the field of human resources.
- Use business terminology correctly when conducting and presenting work and projects.
- Establish constructive dialogues for decision-making.
- Reach consensus in business decisions
- Leading decision making
- Working in a team
- Evaluate and value the opinions of others

3.5.2. Milestones of the activity

A total of three phases were developed within this activity (figure 3):

Figure 3.

Milestones of the course on Organization and Business Management through VR experience



Source: own elaboration.

1st Phase: Review of the practice script: The practice is prepared individually; the students received a documentation with the instructions of the activity they had to simulate in the virtual environment, and they worked on it individually.

2nd Phase: Virtual experience. Three groups of 10 students were formed and they entered the virtual office where they discussed the three profiles set out in the statement. This phase was developed in three stages. In the first stage, sticky notes were used to indicate the pros and cons of each candidate in order to assess their suitability for the job. The second stage was a process of discussion and sharing of the opinions of each participant. And in the third and final stage, the process of dialogue and agreement for the final decision was worked on.

3rd Phase: Group discussion. After doing the virtual activity, the students met with the lecturer to discuss their experience. Among other aspects, they talked about the advantages and disadvantages of using this tool.

4th Phase: Presentation of findings. In this phase, the conclusions of the debate from the previous phase were drawn up.

This activity has allowed students to familiarise themselves with a new teaching technology and to assess its applicability to professional activities. The use of VR has allowed them to work in an environment and under conditions that are difficult to reproduce in a traditional classroom. The scenario in which they have worked is closer to a real work situation and is

more stimulating for them than some traditional teaching techniques. However, this motivation comes, in part, from the novelty of the tool and the extraordinary nature of its use in the training process.

During the experience, each student had to manage a complete function of the company and had to reach a consensus on a decision. In this way, in addition to practising the knowledge of the subject, they were able to develop and understand the importance of some soft skills such as overview, teamwork, capacity for dialogue and consensus and problems solving.

Globalisation and business offshoring mean that these types of applications are increasingly used and are seen as a tool that will proliferate to facilitate business decision-making.

3.6. The Planning of Sustainable Tourism Spaces through VR-based learning

This practice has been conducted as an activity of the subject Planning and Management of Sustainable Tourism Spaces of the Degree in Tourism, focusing mainly on the basic notions of sustainable strategic planning. A total of 40 students participated in this activity with a duration of 3 hours.

The main goal of this activity consisted of analyzing a specific touristic space planning by a fieldwork. Thus, the students are divided in groups of three to select any national or international tourism site so that a holistic planning analysis can be conducted.

A total of eight virtual fieldworks were made along Latin America, Asia and the Pacific and Europe, so that several case studies could be visited through Google Earth and VR gadgets. The teaching instructor led these fieldworks so that students can detect the weaknesses and strengths related to the planning model of the studied sites.

3.6.1. *Developed skills and competencies*

Students who successfully completed the activity worked on the following competences:

- To analyse the economic dimension of tourism.
- To understand the dynamic and evolving nature of tourism and the new leisure society.

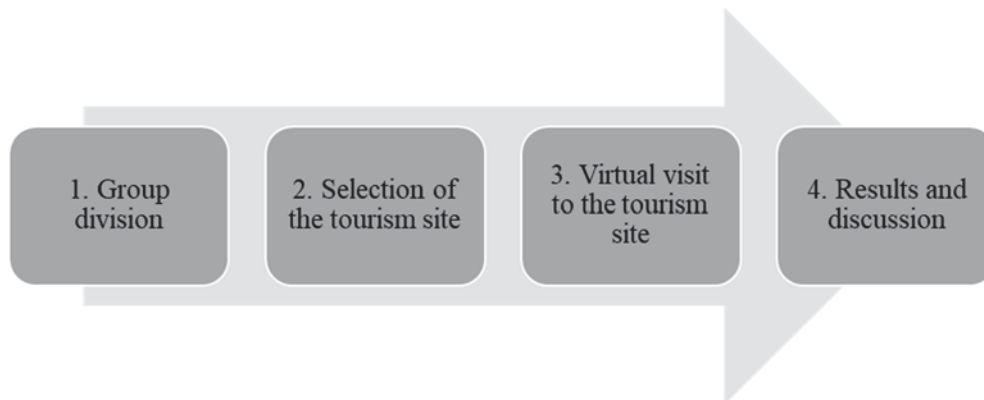
- To know the main political-administrative structures of tourism.
- To convert an empirical problem into an object of research and to draw conclusions.
- Manage the tourism territory in accordance with the principles of sustainability.
- Understand the functioning of destinations, tourism structures and their business sectors at the global level.
- Know the objectives, strategy and public instruments of planning.
- Detect technical planning needs of tourism infrastructures and facilities.
- Analyse the impacts generated by tourism activity.
- Know the main initiatives for the enhancement of cultural heritage.

3.6.2. Milestones of the activity

A total of three phases were developed within this activity (figure 4):

Figure 4.

Milestones of the course on The Planning of Sustainable Tourism Spaces through VR experience



Source: own elaboration.

1st phase: Group division. Each group should have among 2-3 students so that the tourism planning analysis can be conducted from a multiple point of view.

2nd phase: Selection of the tourism site. Each group must select one tourism site to be analysed. This is one of the most important facts of the activity, as the students should assure that the chosen tourism site really represents the characteristics related to the corresponding destination.

3rd phase: Virtual visit to the tourism site. A series of VR-based fieldworks are conducted in each one of the selected tourism sites. Each experience will be led by the responsible group.

4th phase: Results and discussion. Each group will share the main characteristics associated with the chosen tourism site while using a VR-gadget in a common screen. Also, an alternative VR-gadget is shared among the other students so that they may share the same virtual space as the leading group.

From a geographical point of view, this activity enabled to prove how global remoteness could be treated with a VR solution so that several extreme cases related to tourism spaces can be directly addressed along a virtual fieldwork. Also, giving the students the chance to reconsider VR technology as a useful and necessary tool for several purposes regarding the contents of this course.

IV. Results

The results of the questionnaire suggest that there is a significant and positive effect of VR-based technology when it is applied on Tourism Studies teaching (Table 1):

Table 1.

Results of the questionnaire about VR-based teaching on Tourism Studies

Ítems	Mean
1. The visual stimuli provided by VR systems are appealing to users.	4.90
2. The interaction through VR contributes to a better learning of the subject as opposed to the use of a classical teaching methodology.	4.87
3. Time passes faster for me while consuming content through the VR system compared to consuming content through standard 2D displays	4.85

4. Introducing VR in the classroom turns learning into entertainment.	5.00
5. Throughout the learning process, it is necessary to apply theoretical knowledge to practical VR examples to develop new skills and capabilities	4.70
6. Through the simulation and experience provided by VR, students will continue to explore and investigate educational content.	4.70
7. VR develops students' creativity	4.92
8. With the help of virtual reality, a student can learn how to react in certain (unfamiliar) situations.	4.85
9. The possibility to see and experience the different places in the world inside the classroom provided by VR can inspire students.	5.00
10. Virtual environment models teach and train as effectively as reality.	2.00
11. While using a VR system, I feel like I am present in a virtual world.	4.62
12. I feel that shared group experiences in a shared virtual environment are important.	4.73
13. The use of a VR system distracts students from the educational content.	4.88
14. I find it difficult to understand abstract content and concepts without a visual representation of them	4.47
15. Assessment through VR activities is more representative of the knowledge acquired by the students, compared to traditional assessment methods	4.76
16. I believe that my interest in courses and educational content would be greater if interactive content and VR systems were used.	4.86
17. In subjects that incorporate VR, the teacher is the main source of information and interaction.	4.65

18. By using VR systems, students can actively learn and participate instead of passively looking at 2D screens.	4.67
19. The use of VR can encourage an inclusive and multicultural environment.	4.92
20. I believe that VR can enhance the proliferation of online and distance learning.	4.21
21. VR encourages the development of skills and abilities necessary for my future career in the tourism industry.	5.00

Source: own elaboration.

VR based technology proves that this kind of learning initiative makes the learning process more entertaining and attractive (items 1, 2, 4, and 13), as is creativity (item 7).

Inspiration and connection with other places, cultures and environment (items 11, 12 and 19) as a group experience also contribute to build knowledge between all the members of the groups so that knowledge gaps are solved collectively as a combination of weaknesses and strengths of each student.

At the teaching level, the preparation and development of the practice does not involve complex work for the lecturer; on the contrary, the lecturer, who acts as a mentor (item 17), has an easy-to-use tool that allows him/her to broaden the scope of his/her training work. Although the software used can be improved in terms of the possibilities offered to the users.

Also, findings suggest that students tend to disagree that VR-based teaching is similar to traditional methodologies (item 10). Thus, these kinds of initiatives are unconsciously demanded by students not only to better understand and apply the theoretical concepts (items 14 and 15), but also for the development of skills and abilities that are necessary in their professional future (item 21).

V. Conclusions

The development of these learning initiatives has led to a series of improvements in the teaching/learning process in the Tourism Studies courses that these initiatives were integrated into.

Firstly, the students are connected with a technology tool such as VR, for which they are properly prepared, although not well trained. Secondly, the teachers have used a reality that, although virtual, is more real than the one developed with traditional tools, so the incorporation of these new tools seems essential.

Another key aspect for the formative development of the students is the increase in their organisational and planning capacity, both at the individual and group level, since the practice requires a very didactic reflection both in its execution and in its exposition. For his part, the teacher participates in the experience more as an observer guide than as a traditional teacher, which is an incredibly positive professional incentive.

It should also be emphasised that the teaching innovation materialised with the VR glasses is something simple to apply in any Tourism Studies subject, as teachers found a more friendly and pedagogical space to explain the contents by developing the practices with students in a virtual environment.

Finally, although the applications of VR are being especially important in different areas and sectors, its implementation and development in the tourism sector is especially noteworthy because of the relationship it currently has in areas such as tourism and business organisation, marketing and/or destination planning and management.

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