societies

MDPI

Article

Does Mindfulness Mediated by Virtual Reality Help People with Functional Diversity?

Paula Puente-Torre [1,*], Vanesa Delgado-Benito [1], Sonia Rodríguez-Cano [1] and María Lozano-Álvarez [2]

[1] Faculty of Education, Department of Education, University of Burgos, Castilla y Leon, 09001 Burgos, Spain; vdelgado@ubu.es (V.D.-B.); srcano@ubu.es (S.R.-C.)
[2] Faculty of Social and Legal Sciences, Catholic University of Ávila, 05005 Ávila, Spain; maria.lozano@ucavila.es
* Correspondence: pptorre@ubu.es

Abstract: The integration of virtual reality with mindfulness practice is an effective tool for reducing anxiety levels because it promotes a comprehensive improvement of the educational process and the emotional well-being of students. The aim of this study is to analyse the impact of a mindfulness programme carried out using Virtual Reality with people with functional diversity who are studying Adapted Vocational Training in a secondary school. The intervention was carried out for three months, with the aim of improving their attentional and self-regulation skills. This innovative approach allowed students to experience immersive environments that facilitate mindfulness practice, significantly improving their concentration and reducing anxiety levels. Students who participated in this case study and used this technology experienced an increase in their ability to concentrate on tasks, as well as a marked improvement in their emotional well-being. Descriptive analyses and guided interviews were conducted with both students and teachers involved in the teaching–learning process. The results showed the potential of Virtual Reality-mediated mindfulness programmes as an inclusive and powerful strategy to support learning and personal development in adapted vocational training environments. The study highlights its innovation in personalising learning, reducing anxiety, and improving attentional skills through Virtual Reality. It contributes by providing empirical evidence that supports the development of educational programmes and promotes mental health in the educational context.

Keywords: mindfulness; virtual reality; emerging technologies; well-being; functional diversity

Academic Editor: Gregor Wolbring

Received: 28 November 2024
Revised: 28 January 2025
Accepted: 13 February 2025
Published: 19 February 2025

Citation: Puente-Torre, P.; Delgado-Benito, V.; Rodríguez-Cano, S.; Lozano-Álvarez, M. Does Mindfulness Mediated by Virtual Reality Help People with Functional Diversity? *Societies* **2025**, *15*, 45. https://doi.org/10.3390/soc15020045

1. Introduction

1.1. Linking Virtual Reality and Emotional Management

Nowadays, the world is governed by the different transformations that occur in milliseconds. We live in a very dynamic and changing environment, which, as San Martín and Tapia (2023) [1] state, means that human beings must develop skills to manage and regulate their emotions. Given that these changes can affect people's emotions, it is necessary to understand them, as it is an essential skill, not only to strengthen personal growth but also to address the reality in which we live [1].

It is clear that technologies have had a strong impact on current socio-economic development; mobile devices are the main drivers of the generalisation and access to technology in everyday life [2]. At this point, the so-called emerging technologies, such as Virtual Reality, Augmented Reality, or Mixed Reality, whose disruptive potential is destined to be one of the main drivers of this dizzying change, are redefining the way in which we

communicate, relate, and live. In this line, Márquez (2017) [3], shows the need to manage and control emotions in order to maximise the potential of these technologies. He also states that the integration of emotional control mediated by Virtual Reality can lead to an improvement in personal well-being, as well as optimise the performance we have in different digital environments, considering that they are becoming increasingly complex. In short, a correct balance between emotions and technology could lead to an integral and positive development in this digital era.

Likewise, Virtual Reality is set to become one of the main pillars of education, a fact that is already occurring, but which will become more evident in the future (López, 2017) [4]. Based on this idea, several studies have emerged [5,6] that argue the possibility of using emerging technologies as one of the main resources to face the educational challenges that may arise today, as well as the possibility of implementing this type of technology in the teaching–learning (E-L) processes in an optimal way.

Among all these emerging technologies, Virtual Reality (VR), despite the great diversity of existing definitions, is the one that is redefining the way in which we interact with digital environments. As stated by Sousa-Ferreira et al. (2021) [7], it is capable of generating a simulation that emulates different environments, real or fictitious, in which users can observe and interact with the content. Furthermore, this technology is capable of generating a multisensory and interactive response that can resemble a real interaction, which makes it a tool with enormous potential in educational environments. Along the same lines, Valarezo-Guzmán (2023) [8] and Anacona (2019) [9] define Virtual Reality as a tool capable of replacing a real environment with a synthetic 3D environment or with content in three hundred and sixty degrees; in other words, we are discussing computer-generated simulations that allow students to interact with an artificial three-dimensional visual environment or another sensory environment.

1.2. Virtual Reality and Mindfulness in the Academic Context

This change in the educational paradigm, based on the application of Virtual Reality in the academic context, has led to the emergence of different practises in the teaching–learning processes (E-L). In this sense, virtual laboratories appear which, as stated by Vergara et al. (2021) [10], are not only useful in the educational field but can also be relevant in professional environments.

Similarly, we find that Virtual Reality can be used to support different meditation or mindfulness practises, as it has the ability to generate an environment in which distractions can be suppressed and this leads the subject to avoid them; therefore, it is clear that mediating mindfulness practises through Virtual Reality has a number of positive aspects. In the words of Chandrasiri et al. (2020) [11], we found that these practises allow students to enter an environment free of distractions, which could lead to better concentration, unlike real environments in which there are a lot of distracting stimuli.

Through Virtual Reality, students have access to guided meditations and mindfulness exercises in a more interactive and engaging way, as videos or apps can be used to guide students through mindfulness practises such as body scanning, as stated by Torres et al. (2020) [12]. Furthermore, the combination of mindfulness and Virtual Reality has shown great potential to decrease stress levels because a safe and relaxing space can be generated [13], which can contribute to a reduction in stress levels. It is also noteworthy that Virtual Reality is already being used in education to teach and practice mindfulness, and this may be particularly beneficial for students and professionals facing high levels of stress [14].

Overall, Virtual Reality offers an innovative platform for mindfulness practice, enhances the student's experience, promotes stress reduction, and improves concentration;

moreover, according to the study by Schuman-Olivier et al. (2020) [15], this practice also builds skills and equips participants with tools to improve stress.

1.3. Benefits of Mindfulness in Education

Therefore, we find that mindfulness is, according to Kabat-Zinn (2023) [16], a tool that allows us to work on different capacities, which not only promote greater emotional self-control but also generate an increase in personal confidence [16]. The benefits derived from this practice are manifested in various areas of life, including academic, social, and personal [17].

Unfortunately, as Bisquerra et al. (2017) [18] mention in their study, education in the management of emotions is not usually part of the curriculum in classrooms, which is why it represents a significant challenge that deserves to be addressed promptly and that offers concrete solutions in order to provide a better response to this problem. The reality is that, depending on the context in which it is used, mindfulness can have multiple definitions. Some of the most frequent meanings indicate that mindfulness is a method whose main objective is to increase awareness and promote more skilful responses to the cognitive processes involved in the manifestation of psychopathological disorders and other behavioural problems (Bishop et al., 2004) [19]. On the other hand, authors such as Amaro and Singh (2021) [20], emphasise that mindfulness offers the possibility of intervening from the inside out, focusing especially on the development of skills that facilitate the adaptation of individuals to internal and external events, promoting the self-regulation of their own thoughts, emotions, and perceptions, to focus on the present moment, without being carried away by the past or by future concerns.

The application of mindfulness as a therapeutic procedure to address disorders of various kinds, both psychophysiological and psychosomatic, was promoted by Kabat-Zinn (1990) [21]. It was significantly promoted through the development of a programme called Mindfulness-Based Stress Reduction (MBSR), whose purpose is to address stress within the field of intervention of behavioural medicine. It is defined as the awareness that emanates from intentionally directing attention to the here and now, without the need to make judgements [21]. This methodology is supported by studies such as the one carried out by Grossman et al. (2004) [22], in the management of stress, anxiety, and impulsivity, thus allowing individuals to cultivate a greater awareness of the present moment, as well as to develop strategies to adequately manage the symptoms associated with stress, thus improving psychological well-being, based on an eminently practical and experiential methodology (Baer, 2007) [23]. Likewise, (Creswell, 2017) [24] states that thoughts, emotions, and sensations follow patterns that do not allow direct and voluntary control, so instead of trying to modify those negative thoughts or sensations, it proposes to accept them and let them flow, accepting their presence without confronting them.

Mindfulness is an effective tool for addressing students' lack of attention, as well as awakening their curiosity, developing their autonomy, reducing impulsivity and improving attention levels, and creating positive attitudes and emotions towards learning (Brito-Pastrana 2015) [25]. Cepeda-Hernández (2015) [26] argues that the more attempts are made to eliminate events or thoughts that are not to our liking, the more force or persistence they gain. Such attempts at control can increase the frequency, duration, and intensity of the negative stimulus that we are trying to avoid, causing it to gain greater strength, as evidenced by Cózar et al. (2019) [27].

In education, there have been attempts to apply these techniques in the classroom, and one of the most common ways of practising mindfulness is through mindful breathing, i.e., focusing mindfulness on one's own breathing to slow down the heart rate. This can lead to increased blood flow to vital organs such as the brain, which will help to think more

clearly about a task at hand (Mussey, 2021) [28]. In this context, linking Virtual Reality with mindfulness positions it as a highly effective tool (Cózar, 2019) [27].

1.4. Linking Virtual Reality and Mindfulness

In recent years, the potential of Virtual Reality to support and encourage the learning and practice of mindfulness, as well as to improve people's well-being, is beginning to be explored (Drigas, 2022) [29]. Recently, (Crescentini et al., 2016) [30] have conducted a study linking Virtual Reality and mindfulness, and the common element of these studies is to enhance their teaching and practice; regarding the combination of mindfulness and Virtual Reality, immersive virtual environments have been built to simulate emergency situations that may occur in life, and the effect of a meditation programme on the physiological and psychological responses evoked by these situations has been observed (Crescentini et al., 2016) [30]. Regarding the benefits that Virtual Reality brings to mindfulness, it is perceived that it creates a safe context for intervention, reduces costs, and facilitates intervention with people who have difficulty accessing the sessions due to work, geographic health issues, or any other kind. In addition, (Flujas-Contreras et al., 2017) [31] state that it promotes the improvement of the psychometric properties of the assessment and also offers the possibility of assessing in natural contexts and in real time.

Virtual Reality has shown its effectiveness and validity in numerous investigations of various kinds; for example, in cognitive assessment, which was traditionally assessed using classic measurement instruments (Negut et al., 2016) [32]. Likewise, Virtual Reality has shown its effectiveness in the treatment of pain by facilitating the abstraction of users (Kenney & Millin, 2016) [33]. Recently, research has begun to investigate the potential of Virtual Reality, since it has been shown that it favours and promotes learning, mindfulness, and the well-being of people. Authors such as Delgado-Reyes and López (2021) [34] show that it is a tool that enables the assessment and intervention of groups with learning difficulties, as it is a non-intrusive method supported by ecologically valid environments. This approach reduces distractions and allows them to maintain their attentional focus, thus promoting mindfulness. Furthermore, as detailed by [35], it encourages the inclusion of motivating and engaging environments, along with the possibility of creating three-dimensional environments with realistic images, allowing full immersion in the present.

Immersion is when the learner forgets that they are in an artificial world, interacts with the virtual environment, and temporarily loses awareness of their physical surroundings; this sensation is achieved through interactivity, 360° visualisation, motion tracking, spatial audio, or spatial feedback [35].

This research aims to analyse the impact of the application of a mindfulness programme mediated by Virtual Reality, whose purpose is to reduce and mitigate the levels of anxiety among students with functional diversity, as well as to develop attention and emotional self-regulation skills, in order to improve their health and emotional and psychological well- being.

2. Theoretical Framework

The practice of mindfulness has been related to the reduction in anxiety levels, as well as to the improvement of emotional well-being, but the implementation of Virtual Reality for its practice is in an incipient state that is gradually gaining momentum, although the potential for improvement offered by its use has become evident. Although this is a topic whose research is still in an emerging phase, as we can hardly find any scientific literature on the subject, this type of research is booming, given that the application of technologies to this type of programme can facilitate its implementation among different populations, as well as contribute to the improvement and reduction in stress and anxiety levels [36–39].

Along these lines, Navarro-Haro et al. (2017) [39] show the need to explore the responsiveness to training in mindfulness skills linked to Virtual Reality for experienced meditators compared to novices. Also, several studies show that there is a need to create active teaching–learning programmes with Virtual Reality, but that they need to be conceptualised in a pedagogical way in order to promote the active teaching–learning process with Virtual Reality [7]. Other studies also show a significant increase in mindfulness after one or several sessions. In this line, Chandrasiri et al. (2020) [11] highlight the link between Virtual Reality and mindfulness as a potential tool for the prevention of mental health problems and the promotion of mental well-being, given that it improves the emotional state in the short term and can influence in the longer term by developing students' skills and strengths to cope with difficulties and regulate their emotions. On the other hand, it is claimed that the implementation of this type of prevention strategy in university students fills a social need that is considered a public health problem due to evidence showing that university students experience various stressors that can negatively affect their psychological well-being [37].

Finally, Bridge et al. (2024) [40], in their research evidencing users' verbalised comments during mindfulness practice through Virtual Reality, indicate that these environments provide an avenue of escape. Users reported improved mental well-being and high levels of engagement; they also felt that the environment facilitated mindfulness meditation, and the additional opportunities for pseudo-anonymous interactions with peers and tutors were particularly well received by students [40]. It is worth noting that VR-supported practises promote a more inclusive Metaverse, because they offer alternatives to all students, regardless of their abilities and potential, providing possibilities for people with functional diversity [41].

In general terms, the use of Virtual Reality as a mediator of mindfulness programmes constitutes a viable and optimal alternative for the implementation of this type of programme in the academic environment [42]. Although we have the important limitation of the scarcity of studies related to this topic, it is clear that the impact and application of these programmes are effective and promote the improvement of stress and anxiety levels among the university population, as shown in the studies analysed [36–39].

The vast majority of the reviewed studies [43–45] focus on higher educational levels, while the available literature on the integration of Virtual Reality and mindfulness in the context of Vocational Education is extremely limited and may even be considered non-existent. This gap is further widened when the search is restricted to studies addressing Adapted Vocational Education and Training (VET), which makes the task of finding relevant research a considerable challenge. The lack of research in this field underlines the importance of exploring new avenues in the application of immersive technologies and psychological well-being practises, such as mindfulness, in the field of adapted VET, where special educational needs require personalised and innovative approaches. In this sense, the present research could not only generate significant results in terms of educational improvement and psychological well-being for VET students but also has the potential to serve as a replicable model to be implemented with other groups of students with functional diversity. This gap in the academic literature offers a unique opportunity to contribute to the field, as the combination of immersive technologies such as Virtual Reality, with practises focused on emotional self-management and stress reduction, can generate new educational strategies adapted to the specific needs of learners. Furthermore, exploring the feasibility of this approach in adapted VET opens up a range of possibilities in the personalisation of teaching, the creation of inclusive learning environments, and the use of advanced technological tools to foster the holistic development of students with functional diversity.

3. Materials and Methods

3.1. Instrument

The application chosen for the implementation of the intervention is "Tripp", designed with the purpose of fostering a variety of positive emotional states, including concentration, mindfulness, serenity, calmness, and happiness among users (Tripp, 2022) [46]. This resource has an extensive collection of over 100 guided and immersive mindfulness meditations. It incorporates sounds that employ the binaural listening technique, breathing exercises aimed at establishing mental calmness and inducing relaxation, and allows for customisation and personalisation of different types of meditation and exercises, while tracking the user's progress over time [46]. The meditations, presented in audio format, cover a range of themes, from approaches focusing on concentration and calm to experiences designed for escape and distraction. It is relevant to note that this application is currently only available in English. Considering the psychological paradigms addressed, the therapeutic viability of this platform is suggested, particularly in the management of everyday stress and the promotion of positive emotional states [46].

This application seeks total immersion, with an anxiolytic effect, i.e., it acts on the nervous system by reducing anxiety levels through relaxing Virtual Reality. This programme accompanies the student in all the meditation sessions, making them concentrate on their breathing, on the colours, figures, and shapes that are shown throughout the process., In addition, the student listens to a soft background audio throughout the experience. All these elements allow the person to reach a state of mindfulness. We chose to select this application because its features are congruent with the requirements of the study. However, there is no collaboration with the company that developed it at any stage of the process.

At the start of the "TRIPP" programme, the first question it asks users is about their mood; it takes this information as a starting point to guide the user through a series of diverse landscapes, in which colours, shapes, and sounds are altered to achieve a state of mindfulness [46].

The experience is based on breathing exercises that are involve two rows of luminous particles: one, a sinuous line of white stars that flows into the nose to simulate inspiration, and the other, in the same way but orange in colour, and flows from the nose outwards, simulating exhalation. Other exercises resemble games, with floating objects, which are moved by gently bobbing the head to guide the object along the path between visualised obstacles that appear in front of it [46].

For the application of the chosen programme, the Virtual Reality viewer, Oculus Quest, a wireless system consisting of glasses, microphone and headphones integrated into a single device, was used. However, the viewers can contribute to creating a sense of immersion to capture the viewer's attention, but it is the selected application that is responsible for generating a sense of immersion for the user, with the purpose of maintaining attention during the meditation [47].

3.2. Procedure

3.2.1. Objective

The present study aims to evaluate the impact of a mindfulness intervention mediated by Virtual Reality (VR) by implementing the application called 'TRIPP' in adapted Vocational Training (VET) students with functional diversity. In particular, the aim is to reduce anxiety levels, improve concentration and, as a consequence, optimise the students' academic performance. Given that, to date, there is no previous research that has addressed this type of intervention with adapted VET students, this study is a novel contribution to the field of inclusive education and the use of emerging technologies in the classroom. To

this end, a systematic observation of the students before, during and after the mindfulness through Virtual Reality intervention is carried out.

3.2.2. Design and Duration of the Intervention

The intervention consisted of a total of twenty sessions, spread over three months, with a weekly frequency of approximately two sessions per week. Each session lasted 15 min, which allowed participants' attention to be maintained within a time frame appropriate to their level of concentration. The duration of the sessions was set at 15 min, an interval designed to allow effective immersion without generating sensory overload or a significant risk of visual fatigue. This decision is based on the need to adapt the intervention to the characteristics of people with functional diversity, who may require shorter times due to possible cognitive, emotional, or physical difficulties that affect their tolerance to immersive technology. However, it should be noted that, despite this consideration, the intervention did not produce side effects or symptoms of fatigue in any of the participants, according to the observations made during and after the sessions.

The choice to conduct 20 Virtual Reality-mediated intervention sessions is based on theoretical principles established by authors such as Janet Murray and Mel Slater, who highlight the importance of sustained immersion in virtual environments to generate significant and lasting changes in users. According to Murray [47], immersion in virtual environments requires repeated and constant exposure that allows participants to internalise the experience, facilitating a meaningful connection with the environment. This process is essential to promote changes in skills such as emotional self-regulation and mindfulness by allowing users to become familiar with the virtual environment and its dynamics.

On the other hand, Slater [48] emphasises that the feeling of 'presence', understood as the subjective perception of being immersed in the virtual environment, is reinforced through repeated sessions. This repetition allows not only for progressive adaptation to the virtual stimuli but also the consolidation of learning and behaviours related to the intervention. In addition, a multi-session design provides a sufficient time frame to observe and measure changes in indicators such as concentration and anxiety, while reducing dissonance between the real and virtual environments.

Based on these inputs, sessions spread over three months allow for an appropriate balance between prolonged exposure and assimilation of the experience. This design ensures that participants have enough time to consolidate the benefits of the intervention without generating sensory or cognitive overload, contributing optimally to measurable and relevant results in the adapted educational context.

3.2.3. Contextualization

The sessions were held in the students' usual classroom, which was considered the most predictable and familiar environment for the participants. The classroom was set up with dim lighting to promote a calm and relaxing environment, which is an important component in inducing the calm states necessary for mindfulness practice. In addition, the students were located in their usual seats, which promoted an environment of comfort and familiarity. The use of a familiar environment reduces distractions and provides greater adaptability to the technology, which reinforces the ecological validity of the results.

3.2.4. Equipment and Technical Support

For the implementation of the intervention, Virtual Reality (VR) was used to guide the mindfulness practises. The students were equipped with VR viewers and controllers, which were assisted by the teachers at the beginning of each session. Importantly, to ensure the correct use of the technology, the teachers received specialised training in both the use

of the VR devices and the mindfulness practice, which allowed for adequate guidance and support to the students during the intervention.

3.2.5. Data Collection

This quasi-experimental case study used systematic observation as the main tool to assess students' behaviour, concentration, and attitude during Virtual Reality-mediated mindfulness sessions. Therefore, the results are not applicable to other populations with different casuistics. During the sessions, teachers and tutors made continuous observations on students' behaviour, concentration, and proprioception. These observations were based on the teacher's subjective assessment and direct interaction with the students during practice. These observations were processual and carried out before, during, and after the intervention, which made it possible to analyse the evolution of the pupils throughout the programme. In addition, unstructured interviews were conducted with both students and teachers (Table 1) to achieve a more complete picture of the effects of the intervention. These questions emerged through the observations made by the teachers who conducted the systematic observation derived from the use of Virtual Reality for mindfulness practice. The systematic observation was processual, as it was carried out before, during, and at the end of the intervention. The interviews were conducted individually, with the aim of generating an environment without distractions and allowing the students to express themselves more openly, adjusting the questions to the level of understanding and language of each participant. The purpose of these interviews is to assess the impact of the programme on the participants and their perceptions of it.

Table 1. Questions addressed to students and teachers on the use of Virtual Reality in mindfulness.

	Questions
Questions for students	• Do you like virtual reality glasses? • Do you feel relaxed when using them? • Have you noticed that your grades have improved thanks to the goggles? • Do you think the goggles can help you study? • Do you concentrate more when studying while wearing the goggles than without them? • What do you think the use of VR goggles brings to your studies? • What would you improve about the goggles? • Have you noticed any improvements in your anxiety levels?
Questions for teachers	• What has the period of adaptation to technology been like for students since they first used the glasses? • Has it been difficult for them, and has it not been difficult for them? • Do you think English has been a barrier to the use of this application? • What curricular problems do you observe in the implementation of the programme? • Have you noticed that its use impacts grades or improves performance? • What difference have you noticed between Focus and Calm? • Do you think that implementing this technology has helped them to meditate? • Have you noticed changes in performance, motivation, learning, or engagement? • Have you noticed improvements in their anxiety levels? • Compared to other activities, do you observe that students perform better or are more motivated? • Did you enjoy the experience of using this technology in the classroom? • Do you think it is complicated to use this technology with students with functional diversity? • Have you noticed any side effects such as dizziness, strange sensations or nausea? • Do you feel calmer after using the glasses or more anxious?

3.2.6. Training of the Teachers Involved in the Process

The teachers involved in this project have extensive professional experience in the field of vocational training adapted to people with functional diversity, which has given

them specialised teaching skills and sensitivity to the particular needs of their students. In addition to their extensive teaching experience, they have received training in the use of Virtual Reality applied to mindfulness and in the use of the TRIPP programme, covering both the use of VR viewers and the interface and functionalities of the application selected for the project. This training included practical and theoretical sessions that have allowed them to acquire a technical mastery of both the equipment and the Virtual Reality environments, allowing them to guide the students effectively during the sessions. Their preparation together with their previous experience in inclusive education allows them to manage and adapt the contents in an accessible way, thus maximising the positive impact of the project on the participants.

3.2.7. Structure of the Sessions

Each VR-mediated mindfulness session followed a structured protocol with the following steps as shown in Figure 1.

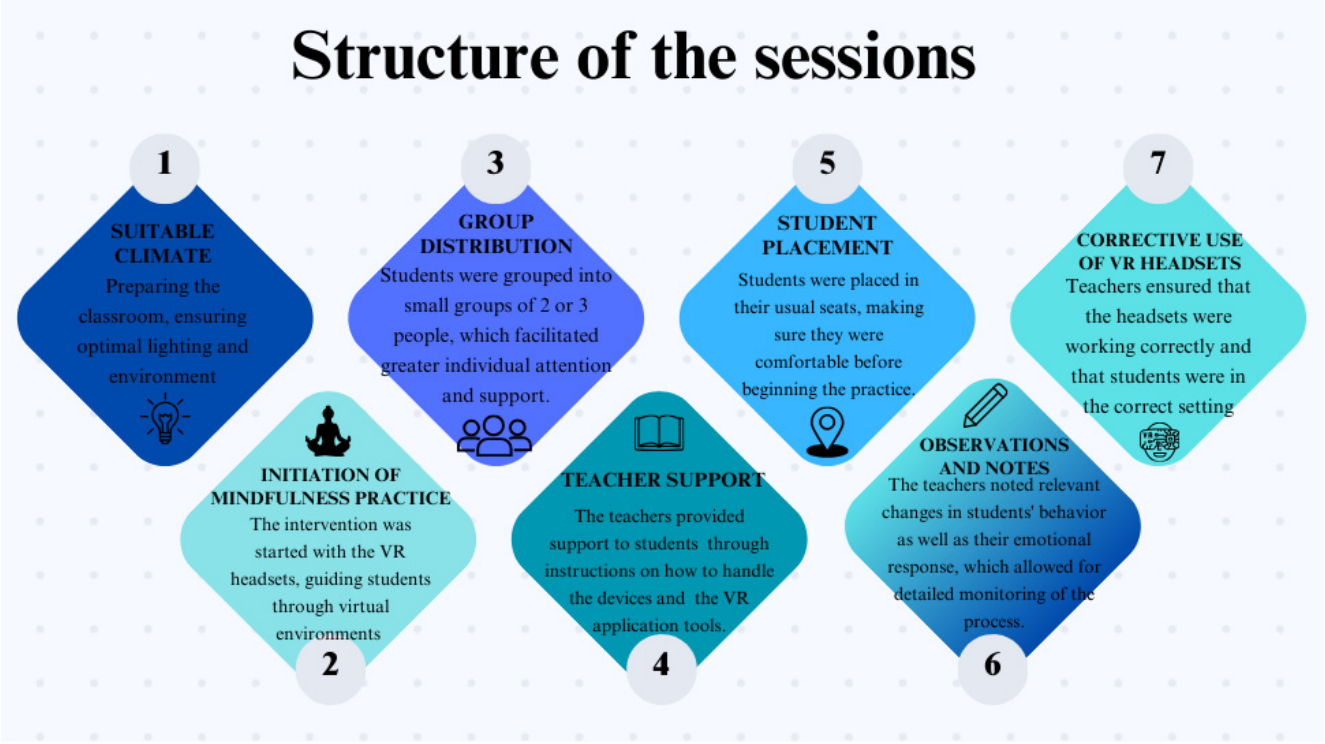

Figure 1. Structure of the sessions.

3.2.8. Evaluation

Several methods of data collection were used to evaluate the impact of the intervention, which can be seen in Figure 2.

Table 2 shows a rubric that will allow teachers to have a guide for student assessment when using Virtual Reality. It is designed to provide clear and objective criteria, promoting a more structured and equitable assessment.

Figure 2. Data Collection Methods.

Table 2. Assessment Rubric for Teachers: Use of Virtual Reality in Student Assessment.

Criterion	Score 1 (Low)	Score 2 (Medium)	Score 3 (High)	Comments/Observation
Interest in virtual reality glasses	Shows little interest or dislikes them	Likes them moderately	Likes them a lot and expresses it clearly	
Relaxation when using them	Does not experience any relaxation	Sometimes feels relaxed but not always	Always feels relaxed when using them	
Improvement in academic performance	Has not noticed any improvement in grades	Has noticed slight or occasional improvements	Has noticed clear and consistent improvements	
Perception of study aid	Does not believe they help with studying	Believes they help moderately	Believes they help significantly with studying	
Level of concentration	Does not improve concentration when studying with glasses	Improves concentration occasionally	Significantly improves concentration when using them	
Perceived benefits	Cannot identify clear benefits	Identifies some benefits but vaguely	Identifies specific and relevant benefits	
Suggestions for improvement	Does not suggest any improvements or considers them unnecessary	Suggests minor or unclear improvements	Proposes several clear and reasonable improvements	

The interviews provided quantitative data which, together with the qualitative records of observations, offered a more complete picture of the effects of the intervention.

Although no standardised instruments were used and no control group was included, this exploratory approach made it possible to capture specific data on each session and to preliminarily assess the impact of the programme in an adapted educational context. Unstructured interviews with both students and teachers reinforced the findings by providing additional qualitative information on participants' perceptions and experiences.

3.2.9. Ethical Considerations

The study was approved by the Bioethics Committee of the University of Burgos (IO24/2024), ensuring that all ethical requirements for research involving human subjects were met. The students and their families were informed about the objectives and procedures of the study, and their informed consent was obtained before starting the intervention.

3.2.10. Participants

The sample of the present research is made up of eleven participants with functional diversity from I.E.S. Teguise, located in Lanzarote (Canary Islands), who are studying an adapted vocational training degree and who are described in Table 3. The sample has a mean age of 18.27 years and a standard deviation of 1.190.

Table 3. Distribution of the student body in relation to gender and age.

Subject	Age	Genre
Subject 1	18	Male
Subject 2	17	Male
Subject 3	18	Male
Subject 4	20	Female
Subject 5	17	Male
Subject 6	20	Male
Subject 7	17	Female
Subject 8	19	Female
Subject 9	19	Female
Subject 10	19	Female
Subject 11	17	Male

The project implementation also involved two female teachers between 40 and 50 years who were responsible for conducting the sessions and answering the interviews.

4. Results

The study details the intervention of eleven students over three months through mindfulness training sessions using Virtual Reality via the "TRIPP" application. All statements made about student progress are derived from the responses and observations of the teachers who led the study.

Both teachers involved in the study share the same opinion about the intervention, highlighting that their assessments are completely aligned. Their assessments not only coincide but complement each other, reinforcing the idea that the technology employed has been effective in improving learning and performing well. As evidenced by the teachers, we can see that each subject showed an evolution with different levels of attention, anxiety, concentration, and proprioceptive control with respect to the initial evaluations in which

the teachers reported low levels of attention and high levels of anxiety. Along the same lines, teachers perceive improvements in concentration, and reduced anxiety levels, and, therefore, relaxation and motor coordination are promoted, as well as the overcoming of initial difficulties in the understanding and execution of virtual dynamics. Some subjects show a preference for certain application scenarios, demonstrating the importance of individual adaptation of the selected application in the implementation of Virtual Reality for well-being, as shown by the teachers. In a Virtual Reality intervention, the key factor lies in the selection of the appropriate application, ensuring that it has the flexibility to adapt to the individual needs of each person. This approach allows the intervention to be truly personalised, enhancing the effectiveness of the intervention and promoting inclusion. The customisability of the application makes it easier for users to interact with environments designed specifically for their abilities and preferences, promoting equal access to the benefits of technology regardless of individual differences.

The following is a classification of the subjects according to their levels of attention, anxiety, and impulsivity, based on the teachers' criteria during the implementation of "TRIPP":

Subjects 1, 3, 7, 8, and 11: Show high or very high levels of attention from the beginning, with progressive improvements in concentration and adaptation to VR dynamics through the "TRIPP App". They are relaxed as their anxiety levels decrease.

Subjects 2 and 6: Experience initially low levels of attention, but with improvements as the sessions progress, overcoming emotional difficulties and adapting to the novelty.

Subjects 4 and 5: Begin with difficulties in comprehension and coordination but achieve improvements in concentration and tolerance to VR sessions.

Subject 9: Despite additional difficulties (hearing impairment), he shows optimal levels of attention, adapting favourably to the programme. At the end of the sessions, his anxiety levels decrease.

Subject 10: Although he participates in fewer sessions, he shows medium-high levels of attention and a positive evolution.

In order to provide an overview of the participants in the study, Table 4 presents the evolution, difficulties, level of concentration, and the most relevant observations for each subject throughout the programme, according to the teachers' criteria.

In order to assess the students' level of concentration, a criterion has been established whereby a student is considered to have a low level of concentration if they can maintain attention on the same activity for less than 10 min. This threshold is based on systematic observation by collaborating teachers, who record specific behaviours such as distractions and changes in activity. The concentration rating can range from low (less than 10 min) to high (more than 20 min), allowing patterns and intervention needs to be identified. A low level of concentration may indicate the need to adapt teaching methodologies or implement strategies that encourage engagement, such as variety in activities, scheduled breaks, and active involvement of students in the learning process. Thus, systematic assessment not only provides data on student behaviour but also guides the improvement of the learning environment and effective learning.

From systematic observation, it appears that the inclusion of "TRIPP" in mindfulness practice leads to an improvement in subjects' attention and perceived well-being, highlighting the importance of individual adaptation and progression throughout the sessions.

Table 4. Evolution of participants.

Subject	Sessions Investees	Duration of the Sessions	Initial Level of Concentration	Developments During the Sessions	Difficulties Encountered	Additional Remarks
1	19 sessions	15 min	Medium–low	Progressive increase in concentration, improved coordination and relaxation. Preference for the game "Calm".	Initial difficulty in understanding the dynamics of the games	Improved postural control and relaxation
2	17 sessions	15 min	Initial low, rising to medium-high	Excited in the first sessions, needs time to concentrate. Increased proprioception over time.	He is very nervous at the beginning	Increased proprioception observed over the course of sessions
3	13 sessions	15 min	Medium-High	Curious, observant, constant concentration.	Difficulty at the beginning in taking breaths.	Improved breathing performance towards the last sessions.
4	15 sessions	15 min	Low at the start, medium later	Initial difficulties in understanding	Initial feeling of suffocation and distress.	Greater predisposition and improved attention.
5	14 sessions	15 min	Very low	improvement in attention.	Lack of control of body movements	Perform the breaths as directed
6	16 sessions	15 min	Medium at start	Constant movements, difficulty in controlling body. Observer on stage.	Verbalise out loud everything that your senses perceive	Autonomy in breathing and observation in scenarios
7	19 sessions	15 min	Medium at the beginning, high at the end	Agitated at the beginning, difficulty with controls. Breathing autonomy.	There are episodes of frustration at not being able to carry out all the guidelines followed	Place your hands on your abdomen to control your breath and become more aware of it
8	18 sessions	15 min	High from the start	Initial frustration. Learns the dynamics easily. Relaxed and concentrated and being aware of your body movements.	It does not present	High attention and precision.
9	16 sessions	15 min	Medium at the beginning, optimal at the end	Paused and concentrated breathing. Precision in movements.	He is hearing impaired and has difficulties in following explanations.	Favourable reception of the programme.
10	10 sessions	15 min	Medium-High	Lower number of sessions than his peers, but his performance in terms of attentional levels has been medium-high from the beginning.	He verbalised everything he saw and described it in great detail.	He was attentive and curious
11	14 sessions	15 min	Medium-High	Concentrated, proactive, relaxed. Breathes easily.	does not present	Optimal concentration and relaxation.

In their testimonies, the students highlighted that carrying out mindfulness practises without the support of Virtual Reality presents them with a challenging task, noting that the use of the technology provides them with a sense of serenity. As a suggestion for improvement, participants expressed the wish for games to be specifically designed and adapted to be accessible in sign language and Spanish. They also showed that their expectations for the use of the application were fulfilled, since using this type of technology was motivating and useful for this type of mindfulness programme, given that this technology allows for the minimisation of external stimuli, which are often one of the main obstacles when carrying out mindfulness programmes without the use of Virtual Reality.

On the other hand, the teachers highlighted the extraordinary adaptation of the students to the programme, highlighting that no adverse side effects have been observed,

although it was evident that the fact that the language of the application is English is a barrier for students with functional diversity, given that, if it were in their mother tongue, Spanish, the process of adaptation to the game would be less complex. Teachers also reported that the use of the mindfulness app resulted in a marked reduction in impulsivity and anxiety levels among students, which translated into better academic performance and a noticeable improvement in classroom climate. The implementation of this programme with students with functional diversity was relatively simple, as they were able to adapt it according to the individual needs of each student, adjusting it to the abilities and level of use that each of them could make of it.

Both teachers and students expressed a greater preference for the "Tripp" application, as opposed to traditional mindfulness programmes, in which various exercises are carried out without the involvement of technology. The reported benefits were mixed, with students showing greater calm and serenity, and a marked increase in feelings of calm and reduced impulsivity as expressed by teachers. However, the teachers participating in the study affirm that the benefits of this type of programme could be applied at all educational stages, although, they state that the implementation of this type of programme may be met with reluctance on the part of some teachers who lack the necessary skills for the use of these technologies or distrust the potential they have to improve educational quality and the mindfulness process. These teachers tend to focus only on the traditional curriculum and do not perceive how the application of programmes such as this one could contribute to the improvement of their students' academic performance and to the increase in grades, as students are calmer and more self-centred and may be more receptive to learning. For example, when Teacher 1 was asked, 'What do you see as the advantages of using Virtual Reality for mindfulness practice?', they responded: 'The main advantage is that the sensation of three-dimensionality makes it possible to bring a set of knowledge closer to people who have learning difficulties, whether temporary or permanent. The images provided through Virtual Reality viewers offer a high motivational component and facilitate the understanding of language, problem-solving, task execution, perception, attention, memory, and orientation. Additionally, it is a tool that adapts to the needs and interests of students, enhancing their overall level of competence'.

While Teacher 1's perspective underscores the adaptability of VR to diverse learning needs, Teacher 2 reflected on the broader impact of VR in the classroom, emphasising its transformative potential. Teacher 2 stated: 'It has been a very enriching experience for both teachers and students, as it opens up a wide field for further exploration. Virtual Reality not only facilitates learning, but also enables the development of new forms of interaction and understanding in the classroom, which is very promising'. Together, these narratives provide an integrated view of the benefits of VR in education".

5. Discussion and Conclusions

In general terms, several studies show that students with special educational needs have difficulties in areas related to social skills. Some of the main proponents of this thesis are Van der Sande et al. (2018) [49] or Smith et al. (2015) [50], who assume that these students may have deficiencies in conflict resolution, failure management, initiation and participation in conversations, etc. These problems associated with students with educational difficulties can be alleviated to a greater or lesser extent with the implementation of mindfulness applications mediated by Virtual Reality, since, as evidenced in the results, according to the teachers, this type of application helps them to be calmer, which will favour the processes of acceptance of failure and tolerance to frustration, among others.

We also note that following the implementation of such an application, there has been a clear improvement in academic performance among the participating students. This is in

contrast to previous studies [49], which state that academic failures contribute to this type of student ceasing their academic efforts, as they do not see results. Through the application of the programme, their academic performance has improved and, therefore, their motivation towards their studies has also increased, since this fact constitutes a positive reinforcement for their self-esteem, fostering their confidence and reducing their anxiety levels.

Several studies [50,51] mention educational applications based on mindfulness stating that they contribute to a significant reduction in the degree of impulsivity, attention, and emotional regulation among students with learning difficulties. This fact corresponds to our results, which show that the level of impulsivity is reduced, and attention improves, as stated by the teachers. Similarly, it is also evident that there is a reduction in the levels of hyperactivity among students with Attention Deficit Hyperactivity Disorder (ADHD). This fact corresponds with the results observed in the implementation of the application of mindfulness mediated by Virtual Reality, given that an improvement in the attention and concentration of the participating students has been observed, as well as a decrease in the degree of impulsivity of these, which is notable since it is the subjects themselves who demonstrate this change [50–52].

On the other hand, the teachers observed that the implementation of the mindfulness application mediated by Virtual Reality contributes to the fact that the students participating in the study have shown an improvement in their proprioception and postural control, as well as greater self-control and self-awareness of breathing, as endorsed by the teachers through systematic observation. In this sense, studies such as that carried out by Griffith et al. (2019) [53], show that participants in mindfulness educational programmes after the application of these programmes showed improvements in their quality of life. Other relevant research in this field is that carried out by Currie et al. (2019) [54], which showed that participants with intellectual disabilities who took part in the mindfulness programme presented better levels of self-esteem and confidence. This fact is also observed among the participants in our study in which the mindfulness programme mediated by Virtual Reality has contributed to these subjects seeing their levels of self-esteem and confidence increase with respect to the initial state. Along the same lines, the teachers involved in the study state that Virtual Reality has a clear potential as a mediator of mindfulness, something that coincides with studies such as those carried out by Wang (2021) [55] and Parmaxi (2020) [56].

By way of summary and in order to put into perspective the potential of Virtual Reality as a mediator of mindfulness programmes, this study has listed the different improvements derived from the application of this programme. Along these lines, Modrego-Alarcón (2023) [37] states that the application of these programmes mediated by Virtual Reality contributes to a significant improvement both in the application of mindfulness programmes and in the results obtained by the participating subjects. Similarly, in the study carried out by Kluge et al. (2023) [45], they observed that the application of mindfulness through Virtual Reality contributes to the improvement of the participants' mindfulness, as well as their physical relaxation. Furthermore, in this sense, several studies [49–51] state that the degree of satisfaction and the rate of acceptance of this type of programme, in which Virtual Reality is the main tool used, is very notable, something that is evidenced in the results of the present study.

The aforementioned studies have a common thread, as highlighted by Murray [57] in her research, where she defines immersion as applications such as the one selected that provide a transformative experience, allowing learners to immerse themselves in a compelling digital environment and generating a strong sense of 'presence'. Furthermore, such immersion is driven by the coherence and interactivity of the virtual environment, allowing the user to explore and feel that their actions have consequences within the narrative [56].

In the same vein, Mel Slater has contributed significantly to the understanding of the concept of immersion and its presence in Virtual Reality, implementing key concepts such as the 'place illusion' and the 'plausibility illusion' [57]. The former refers to the experience of 'being there', where the learner feels that they are actually in the virtual environment. This is paramount for immersion, as it is not only based on the implementation of Virtual Reality, but also on how the applications allow the generation of valid sensorimotor actions that mimic those performed in reality [58]. This immersive experience can be achieved as long as the applications manage to trigger perceptual and behavioural responses that make the virtual environment feel convincing to the user.

In this sense, it defines the illusion of plausibility as the perception that interactions within the virtual environment have an internal coherence and logic that the learner perceives as real and credible. These illusions generated by combined applications allow the learner to behave naturally and spontaneously within the virtual environment, mimicking responses that would take place in real-life situations, a phenomenon that Slater considers fundamental to the study and application of Virtual Reality in psychological and therapeutic contexts [48].

Despite the results shown and their relationship with different studies that allow us to endorse the data obtained, the present study has some limitations. The sample we have is small, and it is also a case study, although representative in the environment in which the implemented programme is carried out. This fact makes it complex to establish generalisations to other areas, and the extrapolation of the results obtained is also complex. It also establishes an initial basis for future research that can incorporate more robust tools and complementary analytical techniques to validate the results obtained. In this sense, one of the future lines of research could focus on the application of this mindfulness programme mediated by Virtual Reality in other educational settings and on a more notable sample in order to establish generalisations about the benefits observed after the implementation of the aforementioned programme.

The programme could also be applied to other groups of students with functional diversity at different educational levels in order to establish similarities and differences with this reference group, carrying out a comparative study. On the other hand, the present programme could be taken as an opportunity to observe its impact on the university population or the elderly in order to establish the suitability of the programme in different contexts and to assess its applicability.

In conclusion, we can establish that the application of mindfulness programmes mediated by Virtual Reality in the educational field is a growing trend, given that this type of programme has shown notable improvements in the levels of attention, reduction in impulsivity, and academic performance of the participants. Although it is true that the field of Adapted Vocational Training for people with functional diversity has yet to be explored, it is clear that the effectiveness of these programmes has been proven in different educational stages, for example, in primary education, where encouraging results have been observed [51]. Furthermore, the efficiency of this type of programme has also been shown in future teachers [52], who improved their levels of mindfulness after participating in mindfulness programmes.

Finally, and after all of the above, it is necessary to confirm that the use of Virtual Reality, not only in the application of mindfulness programmes but also as an educational tool for the improvement of teaching–learning processes, is one of the main axes on which the education of the future could be based, since in addition to being an increasingly widespread technology in society, it offers many alternatives for students and teachers, enhancing the ability to offer alternatives for learning. We can also highlight that the implementation of mindfulness programmes mediated by Virtual Reality in the different

educational stages could contribute to improving the classroom climate and increasing the sense of physical, emotional, and psychological well-being of both students and teachers.

Author Contributions: Conceptualization: P.P.-T., V.D.-B., S.R.-C. and M.L.-Á.; investigation: P.P.-T., V.D.-B., S.R.-C. and M.L.-Á.; resources: P.P.-T., V.D.-B., S.R.-C. and M.L.-Á.; writing—original draft preparation: P.P.-T.; writing—review and editing: P.P.-T., V.D.-B., S.R.-C. and M.L.-Á.; visualization: P.P.-T. and M.L.-Á.; supervision: V.D.-B. and S.R.-C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding. It is part of the doctoral thesis written by Paula Puente Torre and supervised by Vanesa Delgado Benito and Sonia Rodríguez-Cano.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by The Biotethics Commitee of the University of Burgos (protocol code: REGAGE24s00026630654, approval date: 10 April 2024).

Informed Consent Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of University of Burgos (IO 24/2024).

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. San Martín Ureña, R.C.; Tapia Peralta, S.R. The importance of emotional education in the integral formation of students. *Cienc. Lat.* **2023**, *7*, 1398–1413. [CrossRef]
2. Cabero-Almenara, J.; Valencia-Ortiz, R.; Llorente-Cejudo, C. Ecosystem of emerging technologies: Augmented, virtual and mixed reality. *Rev. Tecnol. Cienc. Educ.* **2022**, 7–22. [CrossRef]
3. Márquez Díaz, J.E. Emerging technologies, a challenge for Colombian Higher Education. *INGENIARE* **2021**, 35–57. [CrossRef]
4. López Belmonte, J.; Pozo Sánchez, S.; Morales Cevallos, M.B.; López Meneses, E. Digital competence of future teachers to carry out a teaching and learning process using virtual reality. *Edutec Rev. Electron. Tecnol. Educ.* **2019**, 1–15. [CrossRef]
5. Cabero, J.; Barroso, J. Formación del profesorado en TIC: Una visión de the TPACK model/Teacher training in ICT: A vision of TPACK Model. *C Culto Educ.* **2016**, *28*, 633–663. [CrossRef]
6. Johnson, L.; Adams Becker, S.; Cummins, M.; Cummins, M.; Estrada, V.; Freeman, A.; Hall, C. *The NMC Horizon Report: 2016 Higher Education Edition*; New Media Consortium: Austin, TX, USA, 2016; p. 56. Available online: https://learntechlib.org/p/171478/ (accessed on 10 February 2025).
7. Regivaldo, S.F.; Aparecido, C.X.R.; Sandro, R.A.A. Virtual reality as a tool for basic and professional education. *Metaverse* **2021**, *2*, 12. [CrossRef]
8. Valarezo-Guzmán, G.E.; Sánchez-Castro, X.E.; Bermúdez-Gallegos, C.; García-Alay, R. Simulación y realidad virtual aplicadas a la educación. Anál comport las líneas crédito través corp financ nac su aporte al desarro las PYMES Guayaquil 2011–2015. *RECIMUNDO Rev. Científica De La Investig. Y El Conoc.* **2023**, *7*, 432–444. [CrossRef]
9. Anacona Ortiz, J.D.; Millán Rojas, E.E.; Gómez Cano, C.A. Application of metaverses and virtual reality in teaching. *Entre Cienc. Ing.* **2019**, *13*, 59–67. [CrossRef]
10. Vergara, D.; Fernández-Arias, P.; Extremera, J.; Dávila, L.P.; Rubio, M.P. Post COVID-19 educational trends in engineering: Virtual laboratories. *Mater. Today* **2022**, *49*, 155–160. [CrossRef]
11. Chandrasiri, A.; Collett, J.; Fassbender, E.; De Foe, A. A virtual reality approach to mindfulness skills training. *Virtual Real.* **2020**, *24*, 143–149. [CrossRef]
12. Torres Fernández, D.; Blanca Moya, E.; Pérez Sánchez, R. Immersion and activation of emotional states with virtual reality video games. *Rev. Psicol.* **2021**, *39*, 531. [CrossRef]
13. Wagener, N.; Ackermann, A.; Savino, G.L.; Dänekas, B.; Niess, J.; Schöning, J. Influence of passive haptic and auditory feedback on presence and mindfulness in virtual reality environments. In Proceedings of the 2022 ACM International Conference on Multimodal Interaction, New York, NY, USA, 7–11 November 2022.
14. Žuro, B. Učinkovitost technical technique usredotočene events i virtual realism in smanjenju estresa te ulog osobina usredotočene events I anksioznosti. *Psihol. Teme* **2020**, *29*, 687–706. [CrossRef]
15. Schuman-Olivier, Z.; Trombka, M.; Lovas, D.A.; Brewer, J.A.; Vago, D.R.; Gawande, R.; Dunne, J.P.; Lazar, S.W.; Loucks, E.B.; Fulwiler, C. Mindfulness and behaviour change. *Harv. Rev. Psychiatry* **2020**, *28*, 371–394. [CrossRef]

16. Kabat-Zinn, J. Mindfulness-based interventions in context: Past, present and future. *Clin. Psychol.* **2003**, *10*, 144–156. [CrossRef]
17. Hervás, G.; Cebolla, A.; Soler, J. Psychological interventions based on mindfulness and their benefits: Current state of the art. *Clin. Salud.* **2016**, *27*, 115–124. [CrossRef]
18. Bisquerra Alzina, R.; Hernández Paniello, S. Positive psychology, emotional education and the Happy Classrooms Programme. *Pap. Psicól.* **2017**, *37*, 58. [CrossRef]
19. Bishop, S.R.; Lau, M.; Shapiro, S.; Carlson, L.; Anderson, N.D.; Carmody, J.; Segal, Z.V.; Abbey, S.; Speca, M.; Velting, D.; et al. Mindfulness: A proposed working definition. *Clin. Psychol.* **2004**, *11*, 230. [CrossRef]
20. Amaro, A.; Singh, N.N. Mindfulness: Definitions, attributes and mechanisms. In *Mindfulness-Based Interventions with Children and Adolescents*, 1st ed.; Singh, N.N., Ed.; Routledge: New York, NY, USA, 2020; p. 23.
21. Kabat-Zinn, J. *Living Fully in Catastrophe: How to Use the Wisdom of Body and Mind to Cope with Stress, Pain and Illness*; Dell Publishing: New York, NY, USA, 1990.
22. Grossman, P.; Niemann, L.; Schmidt, S.; Walach, H. Mindfulness-based stress reduction and health benefits. *J. Psychosom. Res.* **2004**, *57*, 35–43. [CrossRef]
23. Baer, R.A.; Smith, G.T.; Hopkins, J.; Krietemeyer, J.; Toney, L. Using self-assessment methods to explore facets of mindfulness. *Assessment* **2006**, *13*, 27–45. [CrossRef]
24. Creswell, J.D. Mindfulness interventions. *Annu. Rev. Psychol.* **2017**, *68*, 491–516. [CrossRef]
25. Brito-Pastrana, R.; Corthorn, C. Teaching presence and its influence for meaningful education: Towards a mindfulness approach in education. *Pedagóg* **2018**, *44*, 241–258. [CrossRef]
26. Cepeda-Hernández, S.L. Dispositional mindfulness and its relationship with well-being, emotional health and emotional regu-lation. *Rev. Int. Psicol.* **2015**, *14*, 1–31. [CrossRef]
27. Cózar Gutiérrez, R.; González-Calero Somoza, J.A.; Villena Taranilla, R.; Merino Armero, J.M. Analysis of the motivation for the use of virtual reality in the teaching of history in future teachers. *Edutec Rdo Electrón. Tecnol. Educ.* **2019**, *68*, 1–14. [CrossRef]
28. Mussey, S. *Mindfulness in the Classroom: Mindfulness Principles for Social and Emotional Learning*; Routledge: New York, NY, USA, 2021. [CrossRef]
29. Drigas, A.; Mitsea, E.; Skianis, C. Metacognition and virtual reality training techniques for learning disabilities. *Sustainability* **2022**, *14*, 10170. [CrossRef]
30. Crescentini, C.; Chittaro, L.; Capurso, V.; Sioni, R.; Fabbro, F. Psychological and physiological responses to stressful situations in immersive virtual reality: Differences between users practicing mindful meditation and controls. *Comput. Hum. Behav.* **2016**, *59*, 304–316. [CrossRef]
31. Flujas-Contreras, J.M.; Ruiz-Castañeda, D.; Botella, C.; Gómez, I. An emotional well-being program based on Virtual Reality and Online Therapy for chronic diseases in childhood and adolescence: The Space Academy. *J. Clin. Psychol. Child. Adolesc.* **2017**, *4*, 17–25. Available online: www.redalyc.org/articulo.oa?id=477152557003 (accessed on 10 February 2025).
32. Neguț, A.; Matu, S.A.; Sava, F.A.; David, D. Virtual reality measures in neuropsychological assessment: A meta-analytic review. *Clin. Neuropsychol.* **2016**, *30*, 165–184. [CrossRef]
33. Kenney, M.P.; Milling, L.S. The efficacy of virtual reality distraction in reducing pain: A meta-analysis. *Psychol. Conscious.* **2016**, *3*, 199–210. [CrossRef]
34. Delgado-Reyes, A.C.; Sánchez López, J.V. Virtual reality: Assessment and intervention in attention deficit hyperactivity disorder (ADHD). *Rev. Electr. Psicól. Iztacala* **2021**, *24*, 72–99. Available online: https://acortar.link/B1tNwz (accessed on 10 February 2025).
35. Montoya-Rodríguez, M.M.; de Souza Franco, V.; Tomás Llerena, C.; Molina Cobos, F.J.; Pizzarossa, S.; García, A.C.; Martínez-Valderrey, V. Virtual reality and augmented reality as strategies for teaching social skills to people with intellectual disabilities: A systematic review. *J. Intellect. Disabil.* **2023**, *27*, 1062–1084. [CrossRef]
36. Ahmad, F.; El Morr, C.; Ritvo, P.; Othman, N.; Moineddin, R.; MVC Team. An eight- week, Web-based Mindfulness Virtual Community intervention for students' mental health: Randomized controlled trial. *JMIR Ment. Health* **2020**, *12*, e15520. [CrossRef] [PubMed]
37. Modrego-Alarcón, M.; López-del-Hoyo, Y.; García-Campayo, J.; Pérez-Aranda, A.; Navarro-Gil, M.; Beltrán-Ruiz, M.; Morillo, H.; Delgado-Suarez, I.; Oliván-Arévalo, R.; Montero-Marin, J. Efficacy of a mindfulness-based program with and without virtual reality support to reduce stress in university students: A randomized controlled trial. *Behav. Res. Ther.* **2021**, *142*, 103866. [CrossRef] [PubMed]
38. Cawley, A.; Tejeiro, R. Brief virtual reality mindfulness is more effective than audio mindfulness and colouring in reducing stress 321 in university students. *Mindfulness* **2024**, *15*, 272–281. [CrossRef]
39. Lillo-Navarro, C.; Fernández-Pires, P.; Gil, G.B.; Martínez-Zaragoza, F.; Chaves, C.; Roca, P.; Peral-Gómez, P.; Valero, M.E.G.; Canales, D.M.; Alfaro, J.L.P.; et al. Effects of a mindfulness-based program on the occupational balance and mental health of university students. Protocol for a randomized controlled trial. *PLoS ONE* **2024**, *19*, e0302018. [CrossRef] [PubMed]

40. Bridge, P.; Mehta, J.; Keane, P.; El-Sayed, O.; Mackay, S.; Ketterer, S.-J.; West, H.; Wilson, N.; Higginson, M.; Hanna, J. A virtual reality environment for supporting mental wellbeing of students on remote clinical placement: A multi-methods evaluation. *Nurse Educ. Today* **2024**, *138*, 106184. [CrossRef]
41. Othman, A.; Chemnad, K.; Hassanien, A.E.; Tlili, A.; Zhang, C.Y.; Al-Thani, D.; Altınay, F.; Chalghoumi, H.; Al-Khalifa, H.S.; Obeid, M.; et al. Accessible Metaverse: A theoretical framework for accessibility and inclusion in the Metaverse. *Multimodal. Technol. Interact* **2024**, *8*, 21. [CrossRef]
42. Zheng, L.; Li, W.; Song, S.; Xiao, X.; Low, S.R.; Zhang, Y.; Yu, X.; Peng, Y. Effectiveness of mindfulness-based virtual reality training on stress, anxiety, and depression among Chinese university students. *Mindfulness* **2024**, *15*, 899–913. [CrossRef]
43. Whewell, E.; Caldwell, H.; Frydenberg, M.; Andone, D. Changemakers as digital makers: Connecting and co-creating. *Educ. Inf. Technol.* **2022**, *27*, 6691–6713. [CrossRef]
44. Malighetti, C.; Bernardelli, L.; Pancini, E.; Riva, G.; Villani, D. Promoting emotional and psychological well-being during COVID-19 pandemic: A self-help virtual reality intervention for university students. *Cyberpsychol. Behav. Soc. Netw.* **2023**, *26*, 309–317. [CrossRef]
45. Kluge, M.G.; Maltby, S.; Kuhne, C.; Walker, N.; Bennett, N.; Aidman, E.; Nalivaiko, E.; Walker, F.R. Evaluation of a virtual reality platform to train stress management skills for a defense workforce: Multisite, mixed methods feasibility study. *J. Med. Res.* **2023**, *25*, e46368. [CrossRef]
46. Tripp, INC. Tripp, 2024. Available online: https://www.tripp.com/research/ (accessed on 10 February 2025).
47. Murray, J.H. Virtual/reality: How to tell the difference. *J. Vis. Cult.* **2020**, *19*, 11–27. [CrossRef]
48. Slater, M.; Sanchez-Vives, M.V. Enhancing our lives with immersive virtual reality. *Front. Robot AI* **2016**, *3*, 74. [CrossRef]
49. Van der Sande, L.; Hendrickx, M.M.H.G.; Boor-Klip, H.J.; Mainhard, T. Learning disabilities and low social status: The role of academic peer reputation and peer reputation in teacher sympathy. *J. Learn Disabil.* **2018**, *51*, 211–222. [CrossRef] [PubMed]
50. Smith, T.E.; Polloway, E.A.; Patton, J.R.; Dowdy, C.A.; McIntyre, L.J. *Teaching Students with Special Needs in Inclusive Settings*; Pearson: Upper Saddle River, NJ, USA, 2015.
51. McFall, A.; Jolivette, K. Mindful breathing: A low-intensity behavioural strategy for students with behavioural problems. *Prev. Sch. Fail.* **2024**, *68*, 1–7. [CrossRef]
52. Alqarni, T.M.; Hammad, M.A. Effects of mindfulness training program on impulsivity among students with learning disabilities. *J. Educ. Soc. Res.* **2021**, *11*, 184. [CrossRef]
53. Griffith, G.M.; Hastings, R.P.; Williams, J.; Jones, R.S.P.; Roberts, J.; Crane, R.S.; Snowden, H.; Bryning, L.; Hoare, Z.; Edwards, R.T. Mixed experiences of a mindfulness-based intervention: Voices of people with intellectual disabilities, their supporters and therapists. *Mindfulness* **2019**, *10*, 1828. [CrossRef]
54. Currie, T.L.; McKenzie, K.; Noone, S. The experiences of people with intellectual disabilities in a mindfulness-based program. *Mindfulness* **2019**, *10*, 1304–1314. [CrossRef]
55. Wang, Z.; Guo, Y.; Wang, Y.; Tu, Y.F.; Liu, C. Technological solutions for sustainable development: Effects of a virtual reality approach based on visual cue scaffolding on reading comprehension, learning attitude, motivation and anxiety of learners of English as a foreign language. *Sustainability* **2021**, *13*, 13977. [CrossRef]
56. Parmaxi, A.; Demetriou, A.A. Augmented reality in language learning: A state-of-the-art review 2014–2019. *J. Comput. Assist. Learn* **2020**, *36*, 861–875. [CrossRef]
57. Murray, J. How C lose Are We to the Holodeck? In *Clash of Realities 2015/16: On the Art, Technology and Theory of Digital Games, Proceedings of the 6th and 7th Conference*; Clash of Realities, Ed.; Transcript Verlag: Bielefeld, Germany, 2017; pp. 29–44. [CrossRef]
58. Slater, M. Immersion and the illusion of presence in virtual reality. *Br. J. Psychol.* **2018**, *109*, 431–433. [CrossRef]