Ethical decision-making training goes virtual

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We present the VREthics application that enables immersive training in ethical decision making of internship psychologist. The development of this app is supported on theoretical information regarding best practices for ethics decisions in Psychology and technological issues concerning the system design. Eleven internship psychologists tested the VREthics and were questioned about their subjective assessment of the app, the VR training experience and its impact on the learning process. They reported a positive appreciation of both the VR training experience (43.52%) and of the impact on their training (31.98%). The most referenced characteristic is related to the realism and interactivity of the case, allowing them a sense of presence. Results are accordingly to the scarce literature and suggest that the VR training can be an important resource for practical learning, providing an educational context close to the real, interactive and engaging context. Therefore, the use of technological tools, more specifically VR, should be integrated in the psychologists skills´ training of the utmost relevance to practice, namely in ethical decision-making. The next steps will be to implement VREthics in the initial training plan for internship psychologists at the Portuguese Psychologists Association, being a differentiating tool in their training that allows a more practical and interactive level of access to fundamental theoretical concepts.

Keywords: ethical decision-making, training, psychology, virtual reality, application, internship psychologists

Introduction

The debate concerning the teaching of ethics in Psychology: from cognition to emotion

Ethics assumes itself as the central element in Psychology as a profession, guiding decision-making and actions in all areas of psychology (European Federation of Psychologists Associations, 2001; Quayle, 2009; Korkut, 2020; Ricou & Marina, 2020). Thus, the teaching of ethics emerges as a *sine quo non* condition in any course or training in psychology (Behnke, 2008; EFPA 2001), in which knowledge, reflection and ethical decision-making (EDM) are considered core competences and are part of psychologist´s professional practice (EPFA, 2001; Ricou & Marina, 2020).

Since the 1980s, mainly due to the work of McGorven (1988), much has been discussed among academics and professionals about how to "teach" and/or "learn" ethics (Behnke, 2005, 2008; Korkut, 2020), with a consensual opinion that it is a complex process.

Beyond the traditional learning objectives, such as: to be acquainted with the Psychologists' Ethical Principles, the rules and regulations (e.g., OPP, APA) that guide professional practice and to be able to use ethical principles and standards to analyze cases, formulate alternative choices and evaluate adequate courses of action (McGorven, 1988), the ability that has been increasingly emphasized is to critically reflect on him/herself as a professional, his/her work and the quality of his/her choices and ethical decision-making (British Society Psychology, 2005; McGorven, 1988; Korkut, 2020; Ricou & Marina, 2020).

Several authors suggest that a purely theoretical teaching does not lead to full awareness and understanding of ethical issues (Behnke, 2005, 2008; Korkut, 2020). It is therefore mandatory to find ways to learn significant ethical contents that support the development of an ethical practice sustained throughout the entire professional trajectory (Korkut, 2020).

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The eventual/probable ethical dilemmas that the psychologist may face are innumerable, so it is impossible to provide students with theoretical knowledge about all of them and their resolution. On the other hand, in some cases, given its specificity, there may be no clear ethical guidelines, so, as Kitchener (1984) indicated, applying judgments of personal value may not be appropriate, given that not all are equally valid.

Therefore, Kitchener (1984) emphasized the need to structure a basic model for ethical decision-making, with the expectation that students learn the steps or stages of ethical decision-making to be applied in the face of ethical dilemmas. Since then, several models on ethical decision-making have emerged in the literature (cf., Cottone & Claus, 2000), highlighting that, for the most part, they are based on an analysis and rational understanding of the situation - such as the Keith-Spiegel and Kooker model (1998) and Fisher (2009).

More recently, the debate revolves around the cognitive versus emotional component in the ethical decision-making process and, consequently, in the teaching and learning of ethical issues in Psychology (Decety & Cacioppo, 2012; Decety & Cowell, 2015; Behnke, 2008; Korkut, 2020; Ricou & Marina, 2020).

According to Korkut (2020), understanding ethical dilemmas from a strictly cognitive point of view is insufficient, arguing that students should be aware of the various vulnerabilities that can negatively influence ethical decision-making, from cognitive errors, emotional factors, situational factors, and social/ organizational pressures. Other authors refer to the importance of including emotional aspects in the decision-making process (Behnke, 2008; Decety & Cacioppo, 2012), stressing that emotions end up playing an essential role in ethical decision making. For this very reason, Ricou and Marina (2020) propose five preconditions for good ethical reasoning, modulating decision making in order to avoid conclusions based on each person's personal experience.

Thus, in this context, it is essential that students and Internship Psychologists understand the role that emotions can play in their decisions (Behnke, 2008), constituting an essential learning objective, involving students 'confrontation with their vulnerability to ethical errors (Decety & Cowell, 2015; Ricou & Marina, 2020).

Virtual Reality as a resource for training in ethical decision-making

In any profession or activity, practical training proves to be a central component in the teaching-learning process. In the case of ethical decision-making, this training, using active methodologies and practical cases, implies on the part of student/internship psychologist the use and articulation between theories, codes of ethics and practical cases (Prentice, 2014; Korkut, 2020), which theoretically enables them to identify and deal with ethical dilemmas.

Several proposals have emerged in the literature (Grose-Fifer, 2017; Levinson, 2015; Prentice, 2014; Korkul, 2020) - since the presentation of practical cases that include ethical dilemmas to be analyzed and discussed in groups, to films or stories that integrate dilemmas ethical and role-playing. Role-playing is considered a strategy that improves, in different dimensions, student`s learning outcomes, namely: in taking others´ perspective, critical thinking and communication skills (Grose-Fifer, 2017), allowing them to consolidate and improve knowledge and competencies in specific areas (McCarthy & Anderson, 2000; Poling & Hupp, 2009).

However, role-playing is not without limitations. One of the criticisms points to the fact that some students consider it to be an anxiogenic situation, expressing nervousness (Stevenson & Sander, 2002), being more focused on evaluating their performance at the expense of learning. On the other hand, this strategy will be less effective when students do not perceive it as realistic, making it necessary to increase investment in the realism of the situation presented to improve students´ involvement.

In the field of teaching-learning, the evolution of technology has allowed the emergence and use of new approaches, namely Virtual Reality (VR), considered an innovative technology in teaching (Oigara, 2018). VR is a technology that simulates or replicates a physical environment allowing its users to have the feeling of "being there" and to physically interact in the environment within the situation (Ausburn & Ausburn, 2004; Mantovani et al, 2003). VR training can provide a rich, interactive, and engaging educational context, being an important resource for practical learning (Mantovani et al., 2003). Given that in VR the learning process takes place in an experiential framework - offering three-dimensional (3D) computational environments with advanced forms of interaction - its use contributes to a greater interest and motivation of the students, facilitating the acquisition and transfer of skills (Oigara, 2018; Mantovani et al, 2003). In the practical training component, VR creates a safe context for learning, given that in the face of errors there is no harm to third parties (as in real situations, under supervision) (Wan & Lam, 2019).

In the field of health care, VR training has been widely used (Mantovani et al., 2003), ranging from tele-surgical applications, interactive simulations of human body and brain, virtual contexts for training in emergency situations, extending to care in mental health (Wan & Lam, 2019). In mental health, a systematic review (Wan & Lam, 2019) indicates that there is a clear relationship between VR simulation and an improvement in empathy, attitude and knowledge of users towards mental illness.

Paradoxically and, despite the consensus on the need for active methodologies within the scope of practical training in ethical decision-making, neither the literature nor the research contains any reference to the use of VR in the training of ethical decision-making. On the other hand, and as it is increasingly assumed that EDM is not an exclusively cognitive process, the inclusion of

emotional and relational aspects is central (Behnke, 2008; Korkul, 2020; Ricou & Marina, 2020). Thus, VR training, due to its characteristics and potentials, can be an innovative resource, allowing a first-person training in ethical decision-making.

The Portuguese Psychologists Association in partnership with HEI-Lab: Human-Environment Interaction (COFAC) developed, between January and September 2020, a VR application –VREthics – that intends to work on the ethical decision-making procedure in the training process of internship psychologists. This paper aims to: (1) describe the development of the VR application for training in EDM and (2) evaluate the perception of internship psychologists and psychology students of VREthics, their experience and contribution to their learning.

System Design

Given the objectives, VREthics intends to provide a short and positive first experience with VR, demonstrating this technology's potential while also delivering a valuable training tool. As such, three main criteria were established prior to the app development: (a) Realism: in order to present an accurate representation of a real life situation, a moderate level of graphical fidelity and animacy was needed for both the virtual client and environment; (b) Ease of use: interactions with the world should be as naturalistic as possible to facilitate user engagement; and (c) Learning: freedom of choice and in-app feedback should be provided whenever possible, while also giving the trainer access to real-time performance metrics in order to help guide group discussion after the experience.

To accommodate all these requirements in an easy and affordable manner, a standalone 6-DOF head mounted display (HMD) with integrated microphones and hand tracking technology was chosen, namely, the Oculus Quest. This device simplifies the implementation process at a minimal cost by easing the need of both external computers and controllers. The application itself consists of nine phases (Figure 1), each incorporated with voice-over and visual cues to help guide participants throughout the different tasks.

Figure 1. *VREthics´ application phases.*
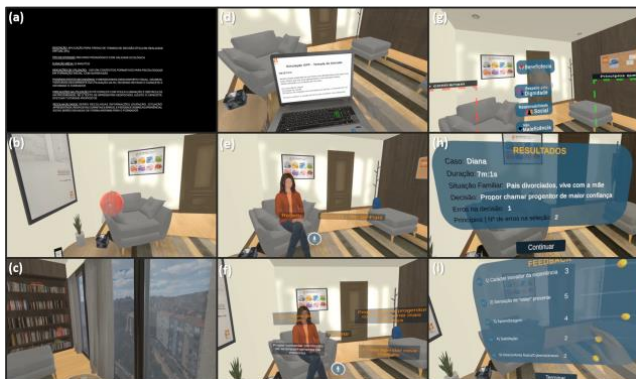
Note. From top to down, left to right: (a) use warnings, (b) input tutorial, (c) familiarization with the environment, (d) case presentation and instructions, (e) voice guided NPC interactions, (f) ethical decision-making with in-app feedback, (g) ethical principles allocation, (h) results summary screen, and (i) session feedback.

The use warning phase briefly presents instructions to remove the HMD in case any motion sickness symptom appears, however, this factor is minimized by having both participant and the non-playable character (NPC) seated. Voice input commands are timed to avoid constant performance drain, and anticipating possible speech detection issues, hand collision with text windows is also available. The framerate varies from 60 to 72 frames per second, which will be further stabilized with newer hardware models.

VREthics was developed using Unity 3D 2019.4 (LTS), thoroughly reinforced with several plugins to further boost its potential, such as: Oculus Integration, for hand tracking and spatialized audio; Microsoft's Azure Speech, for voice recognition; Salsa LipSync Suite, to record and control the NPC's facial animations; Final IK, to pre-record life-like body animations through inverse kinematics; and Beautify, for performant post processing effects such as ACES tone mapping.

For data collection, an output was sent via an automated google form to a secured Google Workspace account, thus providing a simple and GDPR/HIPAA compliant method of providing the trainer quick access to a spreadsheet and summary of responses with a graphical interface.

Training Scenario Design

VREthics consists of one clinical case, Diana, a fictitious client that was sexual molested by her brother-in-law and is afraid to tell her family due to fear of repercussions, hence seeking help from a mental health professional. After a short interaction tutorial, the trainee is first introduced to the case through an interactive laptop in the virtual environment, navigating between screens with conventional keyboard presses through physical hand collisions. The emergence of Diana in the scene initiates two linear voice command inputs: case presentation and relation with parents; the latter ramifying into four randomized replies (good relationship with parents; divorced parents with bad relationship with one or both). The trainee must then choose which of the four available options represents the most adequate one. If the decision is inadequate, the answer color changes, and an error sound is played. If correct (Table 1), a brief explanation of that choice is given over voice-off.

Table 1. *Randomized relation with parents and designated correct answers.*

Situation	Correct Answers
A - Parents divorced, lives with mother	Propose to call parent with whom she feels more trust to an appointment
B - Parents divorced, lives with father	Propose to call parent with whom she feels more trust to an appointment
C - Lives with both parents, good relation with both	Propose to call both parents or parent with whom she more trust to an appointment
D - Parents divorced, bad relation with both	Propose to call the comission for the protection of children and young people

After Diana leaves the room, the participant is asked to drag the ethical principles related to the decision either left or right, against or in favor, playing an error sound if placed wrong, and a correct sound with brief explanation when placed correctly (Table 2).

Table 2. *Positive and negative valence of each ethical principle based on the situation and associated correct answer.*

Ethical principles dimensions	Situation A/B/C	Situation D
Beneficence	In Favor	In Favor
Respect for the person's dignity	In Favor	Against
Social Responsibility	Against	In Favor
Nonmaleficence	Against	Against
Individual Responsibility	In Favor	Null
Professional Responsibility	Null	Against

Although the ethical decision and underlying principles are intrinsically subjective matters, the right and wrong valences were chosen in conformity with the Portuguese psychological code of ethics. Further rationale is meant to be given by the trainer during the presential training sessions that this application is meant to compliment.

Preliminary results

VREthics was tested by 11 internship psychologists, with an average age of 32 years; 8 are female and 3 are male, with training in different areas of psychology (4 in clinical psychology, 4 in neuropsychology and 3 in education and/or social psychology). None of the participants has regular experience with VR (3 have never tried it, 5 very rarely and 3 occasionally).

At the end of the training, the participants answered a semi-structured interview developed for the purpose, to obtain a subjective assessment of VREthics, the VR training experience and its impact on the learning process. The data was analyzed using the Nvivo 10 software, using interpretive phenomenological analysis (IFA), the most appropriate given the nature of the study - IFA focuses on how people experience phenomena and their interpretation of these experiences (Howitt, 2016).

The results show that all participants assess positively the experience of training EDM with VREthics. The most referenced characteristic is related to the realism and interactivity of the case, allowing them a sense of presence.

> - *It gives us the clinical case in a therapeutic setting that, although virtual, generates a feeling of being in an appointment.*

In addition, they evaluate training as an innovative and enriching experience from a traditional point of view, less anxious, mainly because they consider that it does not entail risks for the client.

> - *We are less afraid.*
> - *You can make mistake in the decision making without harming anyone.*

Overall, they consider it to have a positive impact on learning process - they indicate that they have allowed to develop and/or reinforce practical skills, test and consolidate their previous knowledge about ethical principles and EDM, and have enabled a more in-depth reflection on the case and on ethical principles involved, as well as having a better understanding of the EDM process and the implications of this decision in the client's life.

> - *It resembles a case and allows to understand in practical terms the decision-making process*
> - *Allows you to know the various procedures that can occur in specific cases and their implications for the patient*
> - *Helped to reinforce the necessary practical skills*
> - *Due to a more direct interaction with a case (even in VR), it allows to create a reasoning about a case history that is being presented at the moment and in a context close to the real format.*
> - *The training allowed me to test my knowledge and consolidate my ethical principles and the ethical decision-making process. Yes, I think it will be very useful if we have access to this application.*

Five participants report having experienced some initial difficulties in handling the application, such as the difficulty in controlling or accessing the commands, which may result from the lack of familiarity in VR. It should be noted that only one participant makes a less positive assessment of the experience, being the only one who does not mention the positive impact on learning, focusing on the limitations he identified in the environment/NPC (e.g., artificiality, pre-defined options).

This appreciation may be due to the fact that he has a background of greater familiarity/proximity to video games and other technological applications that usually work with more complex environments and, obviously, allow greater control by the user.

Finally, some suggestions are indicated by the participants to maximize learning: include feedback on the emotional management of the case by the psychologist and expand the NPC's emotional expression, in order to also train attendance skills; increase the number of possible options allowing more feedback on errors and, finally, include in the training more cases/situations that imply ethical dilemmas.

In summary, considering the report of all participants, they have positive appreciation of both the VR training experience (43.52%) and of the impact on their training (31.98%). It should be noted that the results are in line with what is suggested in the literature on the use of VR in teaching, confirming its potential as a resource in the training of EDM - it allows the feeling of "being in the situation" and of physically interacting with the environment (Ausburn & Ausburn, 2004; Mantovani et al, 2003), provides a safe context for learning and lessens the fear of the potential effects of making mistakes on customers (Wan & Lam, 2019), provides a beneficial context for cases´ reflection and also for reflection on EDM and its implications (Montovani et al., 2003).

Thus, the preliminary results seem to indicate that VREthics can be an important resource for practical learning, providing an educational context close to the real, interactive and engaging context (Mantovani et al., 2003).

Contributions and future research

In this article we present how the training of ethical decision-making processes with the use of VREthics can be another option in the process of training new psychologists. The use of technological tools, more specifically VR, presents itself as the next logical step in the development of psychological science, allowing psychologists to train skills essential to practice, in a safe environment designed to meet the needs, allowing to close gaps between theory and practice. The next steps will be to implement VREthics in the initial training plan for internship psychologists at the Portuguese Psychologists Association, where we think it will be a differentiating tool in their training, allowing them a more practical and interactive level of access to fundamental theoretical concepts.

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