

Contribution of the teaching of robotics through playful workshops to rehabilitation therapies against drug addictions

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Abstract.

This study was carried out in the city of Guayaquil, Ecuador in the San Juan Pablo II Therapeutic Community, which is dedicated to the rehabilitation of male adolescents addicted to drugs. Playful Robotics workshops were implemented for a group of 13 patients between 12 and 17 years of age. These workshops included the mechanical and electronic design of different educational robots using the software for it, as well as its assembly and commissioning.

In this study it is proposed to establish if these workshops contribute to the therapy for the rehabilitation of adolescents against drug addiction. The research methodology was qualitative, that is, through the results of surveys of the actors in this study, it will be possible to conclude on the main premise. It was proposed to evaluate the possible improvements in attitudes, aptitudes and emotional states during the implementation of the workshops and thus validate the contribution to therapy.

The results of this study may be verified by other investigations to validate this therapeutic strategy for the benefit of the rehabilitation of the adolescent population addicted to drugs and thus it could be replicated in other similar centers.

Keywords: Adolescent, Drug addiction, Robotics, Rehabilitation, Therapy.

1 Introduction

Currently, drug use in adolescents is a very serious social problem in Ecuador. Given this, different rehabilitation and treatment centers have been implemented that provide different therapeutic strategies to reduce and eliminate drug dependence.

One of the therapies used for rehabilitation in these centers consists of carrying out recreational, occupational, entertainment and learning activities.

The following research aims to establish the contribution of teaching robotics through playful workshops to rehabilitation therapies against drug addictions in the San Juan Pablo II Therapeutic Community of the city of Guayaquil.

2 Theoretical Framework

Studies regarding the teaching of Robotics as rehabilitation therapy for drug addiction are scarce. however, several key elements and concepts can be combined that will serve as the basis for the investigation.

Chaglla (2018) carries out a study about the teaching of graphic design as occupational therapy in young drug users within the framework of Art Therapy.

The concept of Occupational Therapy with which according to (Bonikowsky, Musto, Suteu, MacKenzie & Dennis, 2012), it is sought that the subject with addictive behaviors improves their overall functioning in their occupations in daily life, thus achieving functional independence , that is, on the one hand, personal factors (competence, control, security), on the other, environmental elements (context, culture) and, thirdly, components of the person-environment continuum.

Another concept is that of the benefits of teaching Robotics: It promotes interdisciplinarity, inclusion, interaction, problem solving and increases the self-esteem of the participants (Conchinha, 2012) through practice, experimentation and difficult and motivating environments (Ribeiro, Coutinho, & Costa, 2011).

(Carmona Navarro & Díaz Solís, 2013) affirms that playfulness allows improving physical and mental health conditions, in addition to contributing to the ability to assume failures and take actions for their well-being.

3 Methods

For the implementation of these workshops, a workload of 12 hours per week was assigned for 5 months..

A qualitative evaluation analysis was performed. As a measurement instrument, a survey was carried out at the end of the project to: 6 inmate care managers, 6 university students who gave the workshops and 13 interned adolescents.

The workshops were carried out in an interactive and playful way with the aim of making learning entertaining and motivating. .

The topics of the workshops carried out were basically focused on the simulation of electronic circuits and mechanical designs through the Tinkercad program (Fig.1), and construction of educational robots (Fig. 2).



Fig. 1. Teaching Tinkercad program



Fig. 2. Mobile Robot Assembly Teaching

4 Results

The results of the surveys were:

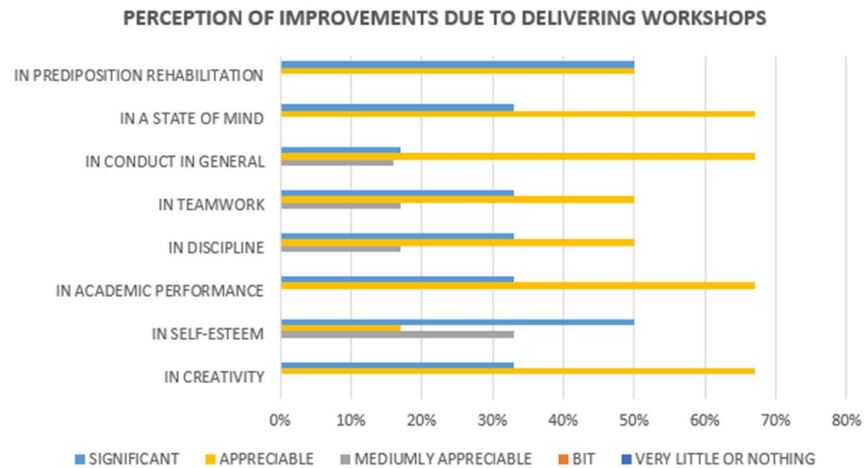


Fig. 3. Survey of caregivers of adolescents

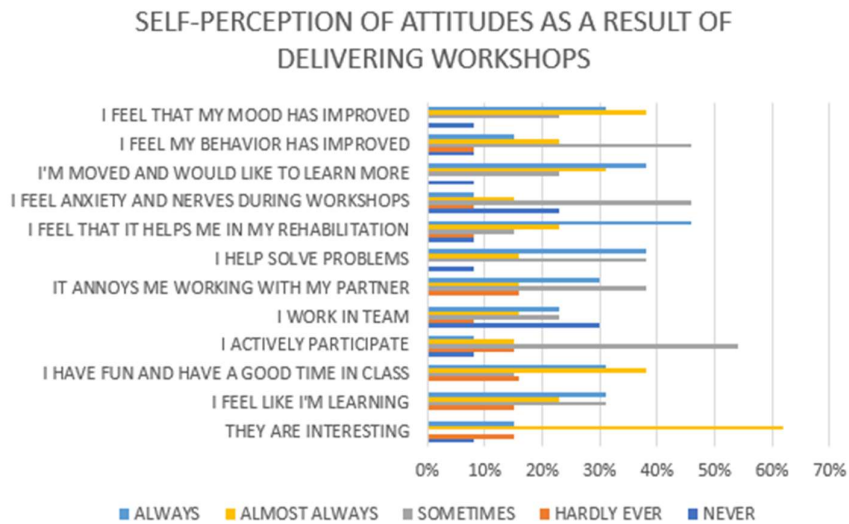


Fig. 4. Survey of adolescents from the Center

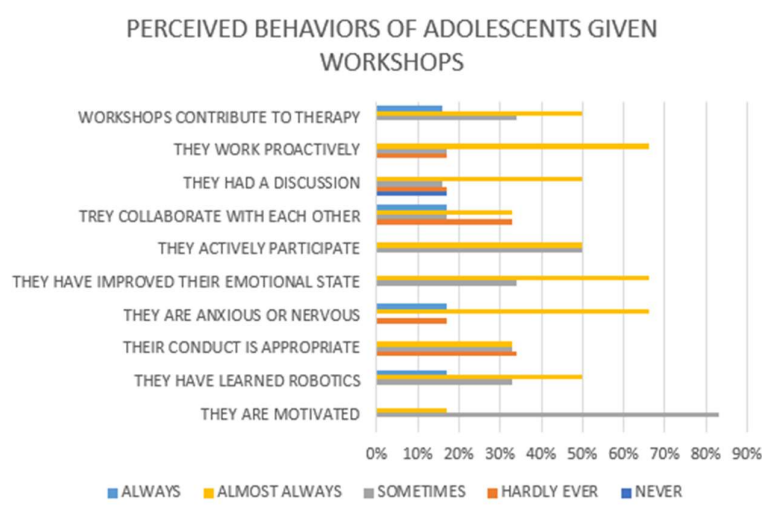


Fig. 5. Instructor Survey

Regarding the premise about whether the workshops contribute to rehabilitation therapies, those in charge of caring for the inmates agreed 100%, the adolescents 69% agreed, and the instructors 66%.

When surveying managers with an open question, 70% agreed that learning and knowledge capacity was fostered by studying something unknown and 17% believed that it helped to develop teamwork..

When asking the Center Administrator about the contribution to the therapy, he commented that the intern felt self-sufficient for having been able to learn this new technology.

Regarding the improvement of the adolescents' mood during the workshops, those in charge agreed 100%, the adolescents 69% and the instructors 66% agreed. In the improvement in the learning of other subjects, the managers were 100% in agreement, the adolescents 54% and the instructors 67%. In the improvement of teamwork, the managers were 83% in agreement, the adolescents 39% and the instructors 50%.

5 Discussion

The qualitative results obtained in this research confirm the initial hypothesis about the contribution to rehabilitation therapy based on observations and perceptions of those involved.

This result is supported in turn by the works cited regarding the advantages of occupational therapy for the rehabilitation of addictions and the teaching of robotics in the development of personal aptitudes and attitudes.

Regarding the study by Chaglla (2018), more forceful results are established by affirming the contribution of occupational therapies.

These new skills contribute to empowerment within the framework of Occupational Therapy which according to (HEGOA, 2006). they strengthen their capacities, confidence, vision and leadership as a social group to promote positive changes in the situations they experience.

This study can open a new approach in relation to the old therapies which are limited to keeping the patient's mind occupied without considering the expectations and motivations of addicted adolescents.

6 Conclusions

Based on the results obtained, it is concluded that there is a contribution to rehabilitation therapies for adolescents addicted to drugs when receiving Robotics workshops. This contribution is reflected in adolescents through improved moods, learning different academic activities, better teamwork and an increased feeling of self-sufficiency..

The works cited supported the hypothesis based on the advantages of Occupational Therapy and the teaching of Robotics.

Learning Robotics opens a different world to the patient undergoing rehabilitation by showing them new technologies that motivate them to learn more and apply the skills and attitudes learned in the workshops to various areas of daily life.

7 Limitations and Future Research

The limitations of this type of research lie in the use of human and financial resources, which are generally not available in rehabilitation institutions.

Future research may provide feedback on this research by implementing these workshops and evaluating the contributions.

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