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Short Review on Interactional Environments Created across Disciplines to Support Occupational Therapy

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Abstract

The primary goal of this work is to propose a multidisciplinary production of interactive environments as a technological support for the rehabilitation of people who attend occupational therapy and have physical disabilities. Today, some technologies and approaches are used to create software to help people with physical disabilities, but physical therapy isn't limited to just one method of rehabilitation. The current work encourages the formation of a multidisciplinary team that includes technologists and therapists so that they can work together to create interactive environments that evolve with each patient's rehabilitation. The effectiveness of the current proposal is demonstrated through a case study, related work, and a number of usability evaluations.

Keywords: Interactive environments; Disability; Occupational therapy; Activities of daily living; Rehabilitation

Introduction

Disability is a human condition that we can all overcome, whether through illness, aging, or an occupational accident [1]. According to some information from the World Health Organization (WHO), more than one billion people, or 15% of the world's population, have some kind of disability, and 2.2% of that population has significant difficulties performing everyday activities. These rates increase regardless of disability because of aging and chronic diseases. Because these health issues are connected to disability and necessitate significant financial support, it is necessary to provide services to ensure that people can maintain the best possible health [2]. The World Federation of Occupational Therapists (WFOT) defines occupational therapy as a profession concerned with promoting health and well-being through occupation or activities such as Activities of Daily Living (ADL) in order to help people with physical, developmental, or emotional disabilities lead independent, productive, and satisfying lives. Actually, there are several techniques and methods as a means of rehabilitation that help mitigate disability [3].

Method

The skills and knowledge necessary to work with individuals or groups of people who are affected by a change in their body's structure or function as a result of a health change, limiting their participation, are provided by occupational therapy. Occupational therapy is used in a wide range of settings, including nursing homes, private homes, workplaces, schools, reformatories, and hospitals [4]. The therapeutic process always involves patients, and its outcomes are varied, geared toward the patient, and measured in terms of participation or satisfaction derived from participation. Strategies to lessen the patient's long-term impact on the therapeutic process of rehabilitation must take into account the requirements of rehabilitation. In order to assist a patient's therapeutic rehabilitation, this work suggests a multidisciplinary approach to the production of interactive software environments. These environments could then collect the data involved in the therapeutic process and organize this information for therapists to formulate a set of patient-specific solutions [5]. This work also encourages the expert's knowledge of occupational therapy, the patient's and rehabilitation specialist's expectations, and the identification of occupational therapy's best practices, such as the activities of daily living. Then, the specification of this knowledge permits the design of a new interactive environment that could offer patients a better solution [6].

Results

There are seven sections in this paper. The subsequent section discusses related work advocating the use of technologies to aid in the rehabilitation of disabled individuals. The problem outline section is all about describing the issues and issues that need to be solved in order to include these interactive settings for the progress of therapeutic rehabilitation. The proposed multidisciplinary production and the prerequisites for creating interactive environments are discussed in the following section. A case study section includes some developed interactive environments that help patients with disabilities who attend the DIF in Aguascalientes, Mexico, with their therapy. The user experience and usability test results are presented in the final section [7]. Patients can reduce their disability and regain motor function with traditional rehabilitation therapies. Repetitive task-oriented training, according to recent research and evidence, has numerous advantages. However, according to WHO, the patient faces obstacles when these traditional techniques are implemented, such as the need for time-consuming procedures, resource-intensive procedures, high costs, and transportation to specialized centers: While 51–53% of people with disabilities cannot afford medical care, approximately 32% or 33% of non-disabled individuals cannot. This may cause the patient to neglect their recovery or, in the worst case, to discontinue their rehabilitation treatment [8].

Discussion

Modern advances in science and technology could make it easier to adapt traditional rehabilitation techniques to the current practice

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and the patient's context. This would create new ways to support the therapeutic rehabilitation process, which would involve defining a multidisciplinary team for each individual patient in rehabilitation. Body movement sensors that are able to track human motion in real time and accurately in accordance with the requirements of rehabilitation therapy are one possibility to consider new devices that are primarily designed for home entertainment. These devices include home video game consoles, tablets, and other similar products. Considering rehabilitation environments with highly interactive components in the graphical user interface and the incorporation of input/output devices with which the patient can interact and deal with rehabilitation therapies, this is an area of opportunity. As a result, software engineering is one of the fields that could be used to drive the development of novel approaches and forms to support rehabilitation therapies.

A multidisciplinary production of an interactive environment is proposed here in order to better assist patients in their rehabilitation therapies by addressing some of their issues; This type of production enables the systematic development of interactive environments using a model-led approach. Identifying the team of experts involved in the rehabilitation process of the patient who receives occupational therapy through an adequate multidisciplinary team in accordance with the needs proposed by experts and patients is necessary because the patient's needs will never be the same; the multidisciplinary team must be tailored to the patient's rehabilitation requirements. In order to carry out the production process of interactive environments, a multidisciplinary team will be required to define those devices. Additionally, interactive environments include feedback mechanisms that are beneficial to experts and patients. Mechanisms like adaptability and knowledge capitalization (good practices, treatment procedures, feedback methods, etc.) Both incorporating it into interactive environments and improving user assistance make it possible to acquire new skills. When a doctor considers that a patient may regain physical ability, an occupational therapy treatment plan must be developed. This process begins when a person has an accident at work or while doing their daily activities. When this happens, the person goes to the doctor, and the doctor gives them a diagnosis that tells them what kind of disability they have and how well they can function. The doctor also tells them how to recover, which may involve doing a variety of activities that are part of occupational therapy techniques and include movements of skill, coordination, strength, etc. The patient learns new skills that can be considered accomplishments during the therapeutic process, allowing the specialist to reevaluate the course of treatment several times until the patient achieves complete recovery. This process could be adapted to the requirements of rehabilitation thanks to an iterative and growing cycle used in the creation of interactive environments. That is, a patient may require a more interactive setting throughout the therapeutic rehabilitation process.

This necessitates the multidisciplinary production shown in Fig. In order to tailor new versions of interactive environments to the requirements of the therapeutic process, requires the participation of a multidisciplinary team and the reuse of existing objects. A user-centered production necessitates a variety of customizable interactive environments for this production. The multidisciplinary production begins with the definition of the "real world." During this phase, rehabilitation specialists establish a therapeutic procedure; prior to this point, the patient should have been given a medical diagnosis.

Conclusion

In the real-world phase, rehabilitation specialists are also identified to form the multidisciplinary team. The thera- canic process allows for the definition of skills based on real-world situations, such as skill activities, sensory, and troubleshooting through movement and situations that reenact daily life activities. It is essential to emphasize which patients have performed the fewest movements while simultaneously demonstrating greater coordination in their movements. An analysis of this result takes into account the level 4 that was achieved through the use of this interactive environment. Patients whose mean is at or below level 4 (140.45), as shown in Fig., meet the criteria. 9. This figure demonstrates that PC and PA achieve greater coordination on average by 80.75 points; however, PC has shown significant improvement, with an average of 126.25 points at level 5. Similarly, PA and PD perform above average in the first session and well above average in the second session; however, PA reaches level 7 (191.5 points) above this, and in the case of PD, performance is below average in the first session with a value of 143 and well above average in the second session with 264.5 points. The physiotherapist can use this result to learn how a patient moves throughout the interactive environment.

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