



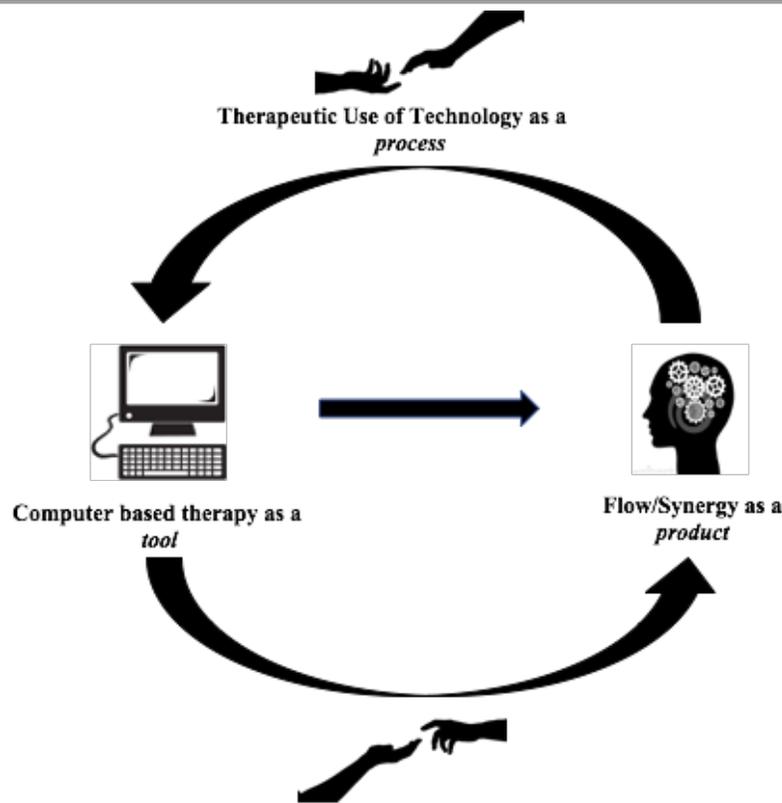
Can Video Games Foster Engagement in Therapy?

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Abstract: Impact of level of engagement on occupational performance in individuals participating in computer-based therapy in the inpatient rehabilitation setting will be presented. Case study examples will be used to integrate this information.

Learning Outcomes:

- Explanation of computer-based therapy and Therapeutic Use of Technology Model
- Connection of flow/synergy
- Understand the current research related to engagement and computer-based therapy
- Provide techniques in applying computer-based therapy and similar strategies to occupational therapy practice



By using computer-based therapy as an intervention tool with the Therapeutic Use of Technology (TUT) model as the therapeutic process, occupational therapists are able to elicit a sense of flow/synergy in their clients, ultimately influencing occupational performance.

Computer-based Therapy as a tool

Technology is an ever-changing, fast-paced, and indispensable tool that has integrated itself into even the simplest parts of our everyday lives. In order to emulate this lifestyle pace, occupational therapists (OTs) are constantly growing and evolving their practice to incorporate therapeutic technology into interventions to meet the individualized needs of clients. “Initially, everyday technology in OT involved arts and crafts; however, today’s technology is moving away from a fully tangible context towards an increasingly virtual one” (Rakoski & Ferguson, 2013). By expanding the definition of technology, we begin to realize that it is not only a component that helps us in our daily lives, but can be seen as an occupation in itself. Computer-based therapy (CT), also defined as occupation-based interactive computer activities, allows occupational therapists to emphasize the virtual context in intervention sessions.

CT highlights the use of everyday, cost effective technologies as an encouraging and sustainable means to meet occupational goals established by a client (Wiemeyer & Kliem, 2011; Rakoski & Ferguson, 2013). This form of therapy consists of virtual reality, exergames (a combination of exercise and video activities) and various rehabilitation digital games that stimulate mental, sensory, movement, and muscle functions to accomplish a task (American Occupational Therapy Association, 2014). Historically, technology has primarily been used as an end or compensatory tool, such as with assistive technology, to help clients increase independence with occupational participation. Through broadening the purpose and use of technology in the therapeutic setting, CT utilizes technology as a means to remediate function and promote occupational performance.

Therapeutic Use of Technology (TUT) as a process

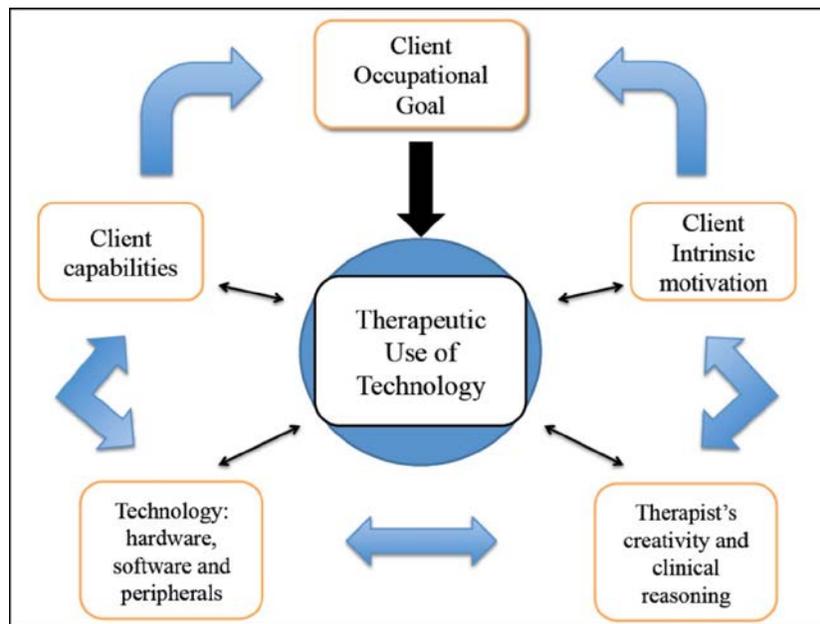


Figure 1: TUT Model

The Therapeutic Use of Technology (TUT) conceptual model utilizes a task-oriented approach



and technology as a means to meet client's goals for promoting skills, which will transfer to their ADL's and IADL's. Through utilizing the TUT model as the process of CT, the therapist is able to continuously adapt each session to the needs of the client through promoting the just right challenge in the virtual context. The TUT model emphasizes client control of each session; meanwhile the therapist incorporates clinical reasoning skills to match the technology to the client's goals, motivations, and interests. This matching process promotes engagement during treatment sessions. (Rakoski & Ferguson, 2015).

Flow/Synergy as a product

Through creating a therapy session that engages the patient, OTs strengthen the client's internal motivation to participate and establish an overall sense of flow. An individual "in flow" experiences a state of being fully immersed in a feeling of intense concentration, focus, and enjoyment in the present moment of an activity, losing a sense of time and space (Nakamura & Csizsentmihalyi, 2009). Having flow within a session provides the opportunity for the clients to actively participate during treatment, expand their skills, and reach their goals. It is through a person's own perspective that creates the quality experience of flow. Through utilizing the TUT model by matching the technology with the client's interest, the therapist can elicit a sense of flow in each session.

Current Research

The following table highlights current research in relation to CT and its impact on functional performance and engagement:

Outcomes	Studies
Improve functional performance	<ul style="list-style-type: none">● Task-specific movement therapy improve upper extremity functional performance for individuals post-stroke (Almhdawi, Mathiowetz, White, delMas, 2016)● Task-specific movement therapy with interactive computer gaming increases finger motion and hand function (Szturm, Peters, Otto, Kapadia, & Desai, 2008)● Nintendo Wii improves UE function in individuals post-stroke (Pietrzak, Cotea, Pullman, 2014)
Engagement	<ul style="list-style-type: none">● Client-centered commercial video games impact perspective on engagement in rehabilitation (Celinder & Peoples, 2012; Naumes, 2013)● Using technology influences motivation and increases client practice outside of therapy sessions (Koch Fagner & Burnfield, 2014)
Improve cognition	<ul style="list-style-type: none">● Computer assisted cognitive rehabilitation improves



	memory strategies and attention in individuals with cognitive deficits (Li, Robertson, Ramos, Gella, 2013)
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Purpose of Study

While many studies address clients’ experiences during CT, there is limited research that measures clients’ engagement in CT and how that influences occupational performance. **Therefore, the purpose of this study was to explore how CT influences clients’ perspectives of engagement in the therapeutic process and the effect of engagement on occupational performance.**

Research Findings

Methods	
Study Design	Prospective Mixed Method Design
Participants	15 patients within the inpatient setting at Loma Linda University Medical Center East Campus who completed at least one CT session; participants ranged from 18-63 years of age; number of CT sessions ranged from 1-5.
Exclusion Criteria	Non-English speakers, under 18 years old, with a FIM score less than 3 were excluded (see table 1)
Instruments	<ul style="list-style-type: none"> ● 8-item Demographic Questionnaire ● 10-item Engagement Survey developed and adapted from the Engagement and Meaningful Activities Survey (EMAS) (Goldberg, et al., 2002) ● 10-item semi-structured interview based on Engagement Survey responses
Data Analysis	
Quantitative data	Microsoft Excel and SPSS (Statistical Package Social Sciences) for relationship of demographics and engagement questions
Qualitative data	Thematic Analysis using Dedoose for open-ended questions regarding engagement

Quantitative Results



Demographic Questionnaire

Table 1: Description of Participants

Variables	Mean	Number
Age	45.1 years	15
# of Treatment	2.4	15
	%	<i>n</i>
Gender		
Female	60%	9
Male	40%	6
Diagnosis		
Cerebrovascular Accident	13%	2
Autoimmune	13%	2
Bone Fracture	20%	3
Spinal Cord Injury	47%	7
Upper Extremity Injury	7%	1

- 93% of participants rated their therapeutic experience as “extremely enjoyable.”
- 80% of participants indicated they would be “extremely likely” to participate in CT again.

Engagement Survey

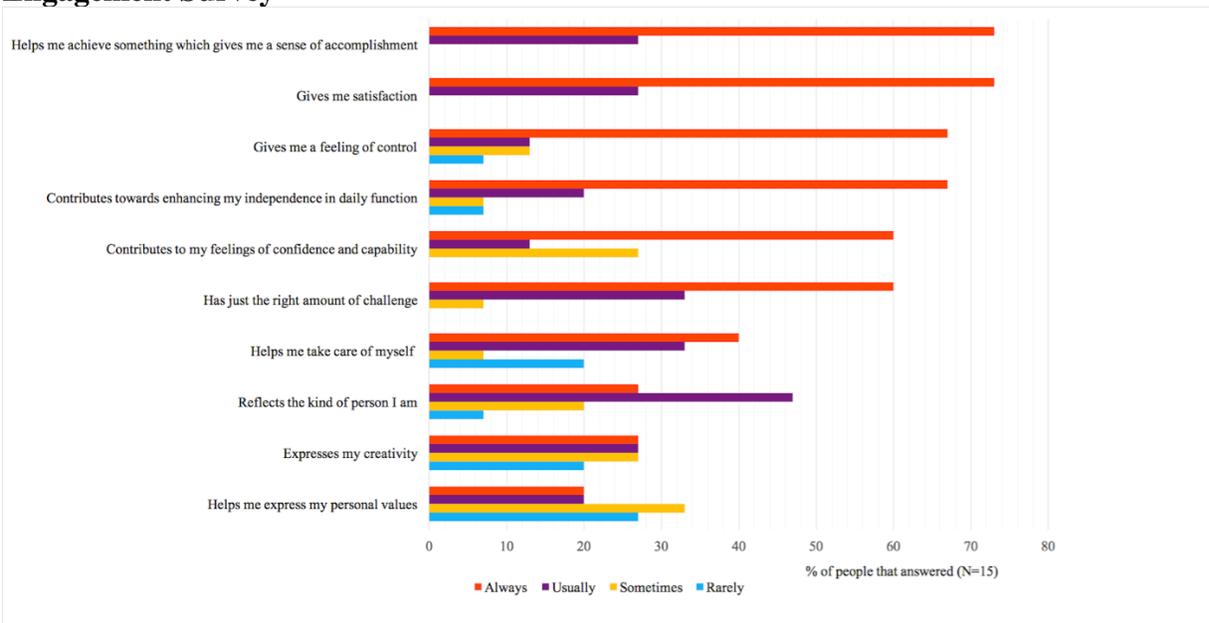


Figure 2: Engagement Survey Questions

- 100% of clients indicated that CT always or usually gave them a sense of accomplishment and satisfaction (refer to figure 2).
- 80% of clients indicated that CT always, usually, or sometimes reflected personal values, expressed creativity, and helped them take care of themselves (refer to figure 2).
- Qualitative findings indicated that the majority of clients did not have a least favorite



aspect of CT.

Qualitative Results	
Theme/Description	Quotes
OT Process: Tailoring CT to the client's interests and values, giving the client autonomy and control, providing the just right challenge, and building rapport.	<p>"It actually gives me the opportunity to work on what I want to work on as far as the movement in my shoulder or my arm, my elbow. It helps a lot."</p> <p>"There's no deviating it's not like automatic for me at this point; whereas the computer was exciting 'cause it was giving me the glimpse into things being automatic again which I really enjoy."</p>
CT Purpose: Adapting CT to address individualized needs to enhance therapy sessions in order to reach goals and foster client independence.	<p>"Rather than just uh playing the game with my right hand which is going to do nothing for me, I use the left hand which is uh, the whole purpose."</p> <p>"As far as the movement, 'cause this arm was really stiff. So today how we did it actually, we were moving it backwards and it was helping me a lot."</p>
Flow & Synergy: A state of intense concentration when one gets lost in the game, is distracted from pain, or experiences an increased internal motivation.	<p>"You're thinking about the computer, you're thinking about playing the game, and you lose your thought about your pain."</p> <p>"It was as if I could just not think about it and just go for it. Like just lift my arms without having any struggle at all."</p>
CT Outcomes Including physical, psychological, and small changes seen by the client, as well as CT translating to daily occupations.	<p>"Just not having to think about being weak. I don't know... just made me feel normal again."</p> <p>"I can put on my shirt easier and take it off. Yeah, it helps."</p>
Recommendations Constructive feedback given by clients about CT	<p>"So, I just wish I had more of it. And I think it should be used every day for therapy or something, somehow, you know?"</p> <p>"It's also my core muscles and my thigh muscle area that</p>



	are the issue, being able to walk. So not just my upper, I also need everything else.”
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Discussion

- Many clients expressed that CT allowed them to get lost in the game, further providing distraction from their pain and limitations, which ultimately increased their motivation and level of engagement in therapy.
- Engagement in flow/synergy instilled a sense of accomplishment in clients that further internally motivated their drive to progress towards their goals.
- The most commonly reported CT outcome was awareness of physical changes, which included increased range of motion (ROM), strength, and quality of movement.
- Clients stated they were able to generalize the skills they gained in CT to real life settings and tasks, making these improvements effective for carryover into their daily occupations.
- By incorporating principles of the TUT conceptual model, clients recognized how the therapist tailored each session to their specific needs and values/interests, provided the just right challenge, and elicited a sense of control, further enhancing motivation and engagement.
- The major recommendations given by clients included incorporating additional muscles and increased guidance from therapist.
- Limitations for this study included abstract questioning, limited number of CT sessions, and clients' misconception of how technology can be utilized to benefit activities outside of clinic.

Implications for CT

- Unique opportunity for clients to enter into a state of flow/synergy that fosters engagement and increased occupational performance.
 - Engagement in a virtual context, and an essential component in the rehabilitation process for a variety of conditions.
 - Further research for a longitudinal design to track Functional Independence Measure (FIM) scores to see if skills transfer to daily activities.
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