A Phygital Game Prototype to Support Speech-Therapy-in-the-Loop AI in Pediatric Rehabilitation

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Abstract

Speech perception is one of the fundamental prerequisites for correct language development in childhood. This process may be compromised in children with Speech Sound Disorders (SSD), for whom early speech therapy intervention is essential. In this context, play-storytelling may constitute privileged intervention tools, given it can simultaneously activate physical, cognitive, and socio-emotional dimensions in child development, making it a speech therapist's ally in repetitive activities of rehabilitative practices. This work-in-progress paper presents a phygital game designed to improve phoneme recognition in children with SSD. Grounded in the principles of Self-determination Theory (SDT) combined with TRACE Speech Perception Theory, the game aims to assist the speech perception activities using a physical component, consisting of composable phoneme cards, and an Embodied Conversational Agent (ECA) acting as mediator, storyteller, and motivator. A conceptual framework on the use of an Embodied Conversational Agent (ECA) in a phygital environment associating Autonomy, Competence and Relatedness (SDT theory) to categorical perception in speech rehabilitation is presented, involving a triadic relationship among child, game-based ECA phygital intervention and the therapist. This contribution include a conceptual model framework on the use of ECAs in a phygital environment and a prototype system aimed at recognizing and distinguishing phonemes during speech-language rehabilitation sessions.

CCS Concepts

• **Human-centered computing**; • **Interaction design**; • **Systems and tools for interaction design**;

Keywords

Phygital game, Speech Therapy, Children, Embodied Conversational Agent, Pediatric Rehabilitation

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1 Introduction

Speech perception and speech production are interconnected processes that develop in parallel from early infancy. The first ability a child must acquire is the perception of sounds, a fundamental prerequisite for achieving their correct production. In the early stages, children may not have sufficient auditory and visual cues to distinguish phonemes; however, contextual information helps them understand the meaning of words and map the corresponding sounds. For example, if an adult asks a child to pick up a ball, the child may not yet perceive the distinction between /ba/ and /da/, but the presence of the object in the room helps them correctly interpret the word [16]. This developmental pathway may be compromised in children with Speech Sound Disorders (SSD). This disorder encompasses difficulties related to the perception, phonological representation, articulation, phonotactics, and prosody of linguistic segments. The origin of the disorder may stem from comorbidity with specific conditions such as Down syndrome or cleft lip and palate, or it may have no clearly identifiable cause [9]. This Disorder represents one of the most common developmental difficulties in childhood, with an estimated prevalence of approximately 6% of children [3]. Diagnosis typically occurs between the ages of 2.5 and 3, and if left untreated, this condition can significantly affect the child's overall development, influencing academic learning, socialization, and, in some cases, psychological well-being through adolescence [14]. Early speech therapy intervention is, therefore, essential to reduce or overcome communication barriers and support harmonious cognitive and emotional growth. Care for the child patient should adopt a holistic perspective, considering the individual in their entirety: body, mind, and social context while recognizing the central value of relational bonds [2]. The UNICEF Convention on the Rights of the Child dedicates a specific article to the right to play [26]: Article 31 affirms that children have the right to engage in play because it contributes to their health, well-being, and development. Ensuring appropriate opportunities for play is particularly important when children are ill or hospitalized, as it plays a significant role in facilitating their recovery. Play is, indeed, of vital importance for healthy child development. It stimulates physical, cognitive, emotional, and social domains simultaneously [19]. Yogman et al. (2018) advocate for play as a prescriptive tool in paediatric care, demonstrating that it exerts both direct and indirect effects on brain structure and functioning, underscoring its

value in promoting healthy development and coping skills. For children with language disorders, play is a central therapeutic tool: beyond supporting learning [7], it serves an emotional function by reframing errors as opportunities for reward and growth [28]. In addition, games may motivate children to speech therapy and support cognitive scaffolding by fostering autonomy and positive expectancies, competence with sense of mastery and learning experiences, and relatedness with supportive relationships [1] combining them with the components of speech (features, phonemes, and words in TRACE model). Integrating interactive systems and Embodied Conversational Agents (ECAs) [5] in games enable the creation of personalized and stimulating play environments, fostering more natural verbal and non-verbal communication [20]. Indeed, interaction with ECAs are likely to be particularly immersive, offering users a realistic perception of space that includes elements such as deixis, indexical language, and body orientation. This approach also opens new possibilities in the rehabilitation field, building on peer-based collaboration, i.e. intelligent agents are, in fact, capable of simulating virtual companions that serve as a motivational tool, providing emotional feedback or encouraging the user to explore alternative solutions [13]. Also, the approach of a Speech Therapist-in-the-loop, in which therapists are embodied in this AI system's workflow fostered by ECAs and control the process and tag the therapy activities and patient's performance, contrasts with others as Therapist-on-the-loop (i.e, autonomy of AI while therapists monitor the therapy process) or Therapist-out of the loop (i.e., full autonomy of AI in the process) that may impact patient-therapist relations. This work-in-progress contribution presents a conceptual model framework on the use of ECAs in a phygital environment associating STD to speech perception therapy involving this triadic relationship children – game - ECA intervention – speech therapist.

2 Background and Related Work

Game-based therapies have been on the rise in healthcare to promote motivation, engagement, and the long-term sustainability of healthy habits [6]. In the field of rehabilitation, games aim to provide an intervention context for the reacquisition, recovery, or maintenance of patients' functions, both motor and sensory. The Kokol et al. (2020) study shows that their use with children affected by neurodevelopmental disorders yields encouraging results in terms of anxiety reduction, emotional regulation, and rehabilitation in cases of cerebral palsy. These can take physical, digital, or hybrid forms, combining physical and digital dimensions to create an immersive and multisensory experience that enriches user engagement. In line with Constructivist theory, children build their knowledge in an exploratory way, through active and self-directed interaction with the surrounding world. The hybrid format of phygital games aligns with these natural learning tendencies, enhancing kinaesthetic and visual learning styles while preserving the intrinsic motivation to play [22]. Besides, games can support speech therapists by offering a tool to target specific linguistic goals and strengthen each child's interpersonal skills, through mechanics that promote language practice, structured social interaction, and turn-taking [25]. A further distinctive advantage of the phygital approach is the reduction of screen time, which, beyond encouraging sedentary behaviour, can in extreme cases also lead to forms of dependency without sacrificing the playful component that characterises games [15].

It is also worth mentioning that many projects have explored the intersection of phygital design and paediatric rehabilitation. For instance, Stellini et al. (2025) developed "Olly's Adventures", a board game connected to a companion mobile app through QR codes, designed to improve the language skills of bilingual English-Maltese speaking children aged five to eight. The game supports language therapy by combining physical gameplay with digital language tasks, with customizable difficulty levels to accommodate different developmental stages. Similarly, Gelsomini et al. (2019) proposed Reflex, a cross-platform application for smartphones and tablets that bridges the physical and digital worlds by tracking physical objects placed on a surface via a mirrored camera, offering therapists the ability to create personalized activities for children with neurodevelopmental disorders. In the context of specific learning disorders, a dice-based visual recognition system was developed to connect tangible physical objects to a smartphone application, allowing speech therapists to engage children through manipulative play while leveraging digital feedback. More broadly, research on Tangible Digital Storytelling, as demonstrated by the i-Theatre tool used in the INCLUDED project, highlights how phygital interfaces can enhance collaboration, narrative skills, and engagement in children with and without special needs [21]. These works share the following design rationale: Physical interaction supports multisensory learning, reduces screen dependency, and enables richer therapeutic relationships among children, technology, and clinicians. Nevertheless, a notable gap seems to exist when incorporating a human-AI therapeutic conversational relationship in paediatrics that may on the one hand motivate children's autonomy-competence-relatedness in the rehabilitation repetitive activities performance, but on the other hand, can compromise trust in the therapeutic process or deviate from the therapy goals unbalancing with engagement.

3 Prototype concept and design

The concept of the game relied on the principles of Self-determination theory and TRACE Model in Speech Therapy with the goal of recognizing and distinguishing phonemes during speech-language rehabilitation sessions, as well as other transversal skills such as attention and memory. The TRACE model is a computational model of speech perception, that is, of how the human brain interprets and recognizes words. According to this model, perception occurs in real time through mechanisms of activation and inhibition [17]. The process involves three hierarchical levels of processing: features, namely the acoustic properties of sound; phonemes, that is, individual linguistic sounds; and whole words. Each unit within each level represents the presence of a linguistic element at a precise moment in the audio signal. Compatible units activate one another for instance, the phoneme /k/ reinforces the activation of the word "kiss", while incompatible units inhibit each other for example, /k/ and /g/ compete with one another. This continuous exchange of information across levels enables robust recognition even under difficult conditions, such as background

noise, coarticulation, or phonetic ambiguity, making speech perception a parallel, interactive, and bidirectional process [18]. Self-Determination Theory posits that growth and motivation depend on the fulfilment of three innate needs: autonomy (feeling free), competence (feeling effective), and relatedness (feeling welcomed and connected) [11]. To ensure a positive therapeutic relationship, the speech therapist works to nurture these needs, supported by the ECA as a strategic ally. Indeed, the avatar boosts the child's confidence through timely feedback and active engagement, transforming the session from a mere clinical task into an intrinsically rewarding experience.

A three-layered architecture guided the design process:

- The Embodied Conversational Agent Layer (Digital): An LLM-based agent supports a pre-structured dialogue and conversation designed by the researcher.
- The Game Physical Layer interlinking with the ECA (Digital): The physical component is integral to the game, providing initial motivation and serving as the judge that determines the correctness of each choice.
- The Speech Therapist Dashboard (Digital): A digital interface through which the therapist manages and validates the session using pre-programmed responses.

3.1 The Embodied Conversational Agent layer (Digital)

The digital component of the game is embodied by an avatar with a cartoonesque and toy-like graphic style, consistent with the aesthetics of the physical cards. The avatar's communicative design draws on key linguistic and pragmatic principles. Through deixis, the agent provides contextual grounding for word meaning, for instance, through explanatory images or short visual cues that anchor abstract phonemic distinctions to concrete referents. Indexical language is employed to direct the child's attention toward specific objects or situational context, using signs and references that point to what is physically present in the game. Body orientation and gestural cues such as pointing "here" or "there" further reinforce spatial and semantic understanding, amplified by the sense of presence that the embodied agent conveys. The ECA's dialogue structure is organised into three phases: an introduction, an explanation of the game rules, and a feedback phase during gameplay. Feedback is delivered multimodally, through synthesized speech and simultaneous text displayed in the chat interface, ensuring accessibility even for children with limited reading proficiency. At the opening, the avatar introduces the story, establishes the narrative context, and explains how to play. During the game, it actively intervenes to communicate whether a petal choice is correct or incorrect, offering hints and support in moments of difficulty. When a child becomes distracted, the avatar functions as a motivational tool, redirecting attention and encouraging re-engagement. The timing of these engagement prompts is configurable by the therapist and can be adjusted on a per-patient basis, ranging from a few seconds to several minutes depending on the child's attentional profile and therapeutic needs. Its vocal interaction plays an important role in reinforcing active listening to spoken words. Throughout the session, the avatar acts as a mediator: it confirms correct answers, encourages players with motivational phrases, and prompts attention if too much time passes without a response. In moments of repeated difficulty, rather than dwelling on individual mistakes, it shifts focus toward the overall journey, turning frustration into an opportunity for encouragement. From a conversational standpoint, the agent is designed to replicate the communicative style of a digital companion, friendly, non-judgmental, and playful, deliberately moving the child's attention away from errors or moments of frustration and reminding them that the interaction is, above all, a game. In the case of an incorrect response, feedback is never punitive or discouraging; instead, the avatar offers constructive guidance aimed at improving the child's next attempt, such as inviting them to pay closer attention, to try again, or to speak more slowly and articulate their words more clearly. Conversely, when a response is correct or an exercise is completed successfully, the avatar congratulates the child and encourages them to keep up the same effort, reinforcing positive behaviour through immediate feedback.

3.2 The Game Physical Layer interlinking with the ECA (Digital)

The proposed game is a competitive phygital game. An introductory story is provided to motivate and engage children, establishing the game's setting. To play, physical cards and a digital platform with an internet connection are required. The game is structured as a challenge between two players who take turns, with the goal of recognizing words and composing flowers. The target age range for the game has been identified as children aged 7 and above, who demonstrate a deeper and more stable understanding of game rules. Younger children, from age 5, may also participate, although they tend to perceive self-created rules as more flexible and subject to modification than adult-imposed ones; their inclusion therefore requires therapeutic scaffolding to support rule comprehension and maintenance throughout the game session [11]. Beyond its primary therapeutic objective: supporting children with primary language disorder in recognizing and distinguishing phonemes during speech-language rehabilitation sessions, the game also incorporates other transversal skills through its mechanics.

The game begins with an introductory phase in which the avatar tells the story of a mischievous wind that, blowing too hard, has scattered all the flower petals: its role is then to invite the players (the patient and the therapist) to put the flowers back together. The flower cards are distributed to each player, while the petal cards are shuffled into a random deck. The therapist determines how many flower cards to assign to each player, with a minimum of one and a maximum of three per participant.

During the game, players take turns drawing a petal card and must figure out which word it belongs to, deciding whether to keep it or not to complete their flower; they then ask the avatar for confirmation, who repeats the word out loud, actively encouraging listening, and gives a judgment on the choice. When more than one flower card has been assigned per player, completing the first flower triggers progression to the next, continuing until all assigned petal cards have been used. The game ends when either the petal card deck is exhausted or one of the players has successfully completed

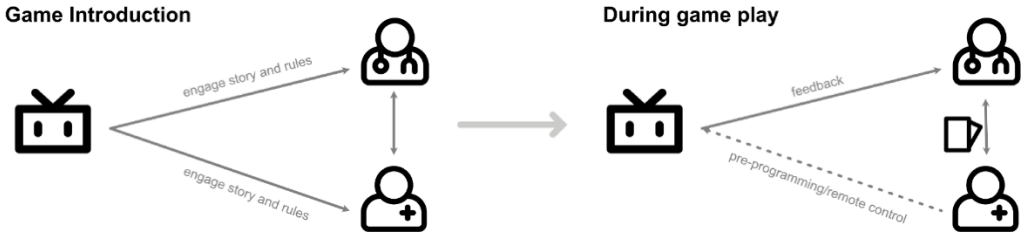

Figure 1: ECA-Therapist-patient relationship



Figure 2: Photo of test game dynamics

all of their available flowers. At that point, the player who has the flower with the most petals will be the winner.

The very structure of the gameplay experience encourages children to maintain attention to the activity, respect turn-taking, and face situations of winning and losing, learning to manage the emotions that arise.

The physical game materials consist of two types of cards: “flower” and “petal” cards. Flower cards represent a specific phoneme and form the centre around which the game is built. Petal cards, on the other hand, display the words associated with each phoneme, accompanied by a reference image that facilitates comprehension and visual recognition. Petal cards are double-sided and can be of two types: cards depicts either a common word (like “apple” or “photo”) or a special character card featuring an illustrated bee engaged in an action or role whose name begins with a specific target letter, such as a ”pizza chef bee” or a ”musician bee.” The cards are designed to be combinable, making the progressive construction of the flower visually apparent. The graphic style evokes children’s drawings: simple 2D illustrations, without backgrounds, with cartoon-style characters, to appear immediately familiar and appealing to children.

Petal cards are constructed following the logic of minimal pairs. A minimal pair consists of two words that differ by only one phoneme: this seemingly small difference is sufficient to completely change the meaning of the word. The use of minimal pairs in clinical settings aims to make children aware of differences and to stimulate them to produce precise phonemic distinctions [23]. The phonemes represented on the cards are labials /p/, /b/, /m/, dentals /t/, /d/, and labiodentals /f/, /v/. All of these phonemes share a common feature: they are produced in the front of the mouth.

3.3 The Speech Therapist Dashboard (Digital)

The dashboard dedicated to the therapist is a tool designed to allow the speech-language pathologist to easily manage the ECA’s interactions. The interface is conceived to be minimalist (Figure 4), with a personalized profile for each patient, and offers a dual

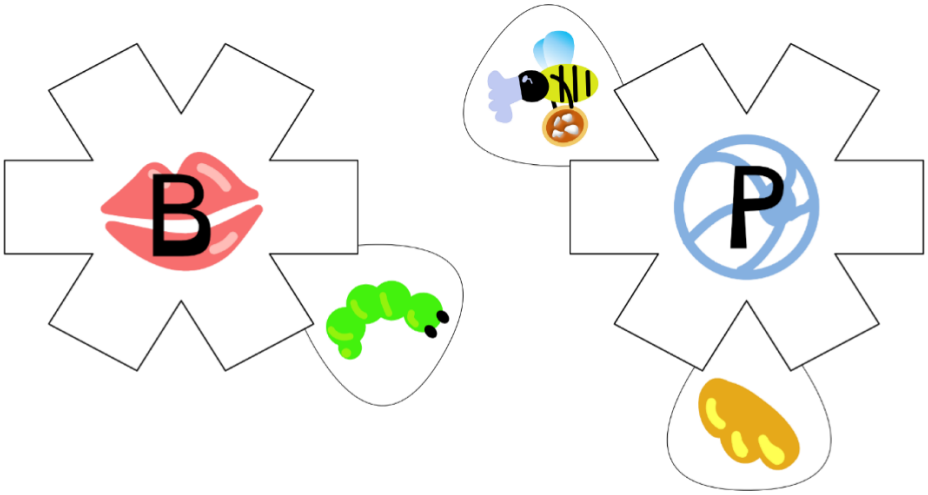

Figure 3: Illustration of flowers construction (/b/: "bruco" (caterpillar) - /p/: "pizza", "pane" (bread)).

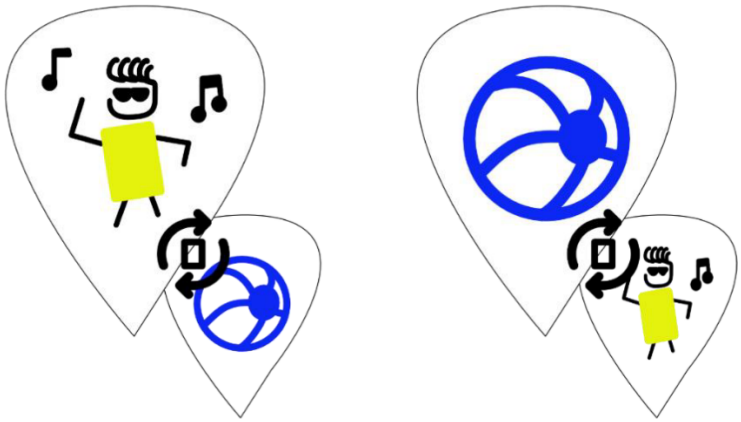

Figure 4: Petal card "Balla" (dance) / "Palla" (ball)

operating mode that distinguishes the gameplay phase from data analysis. During the session, the professional has access to three quick commands: one to validate correct answers, one to flag errors, and one to redirect and encourage the child's attention toward the task. The ECA is equipped with a standard knowledge base of pre-compiled responses, which the therapist can expand and personalise according to the individual patient's needs. An instant typing function is also available, allowing the professional to intervene in real time during gameplay and handle any unexpected situation flexibly. The statistics section offers therapists the ability to monitor, over time, the correct and incorrect responses of each child. In this way, longitudinal data on the progression of gameplay is returned, providing another resource for tracking each patient's rehabilitation journey.

4 Conclusion and future works

This paper has presented a proposal for a phygital game for paediatric speech therapy rehabilitation, designed as a support tool for specialists throughout the therapeutic process. Based on the principles of Self-determination theory and TRACE Model in Speech Therapy, the developed game integrates elements of challenge, gratification, and engagement within traditional clinical practice, with the primary objective of enhancing phonemic perception in children. The game has been designed with a target age range of 5 to 7 years. Children aged 7 and above are expected to engage with the rule-based structure of the game autonomously, while children from age 5 may also be included, though their participation requires active therapeutic scaffolding to support rule comprehension and maintenance. The choice to focus on phonemes produced at the front of the mouth: labials (/p/, /b/, /m/), dentals (/t/, /d/), and labiodentals (/f/, /v/), responds to a precise rehabilitative principle; indeed, perception represents the fundamental prerequisite for correct speech production. The use of minimal pairs, that is, pairs of words differing by only one phoneme, aims to make children aware of phonemic distinctions and to subsequently stimulate more precise production. The phygital nature of the game is one of its most significant strengths. It respects children's natural exploratory

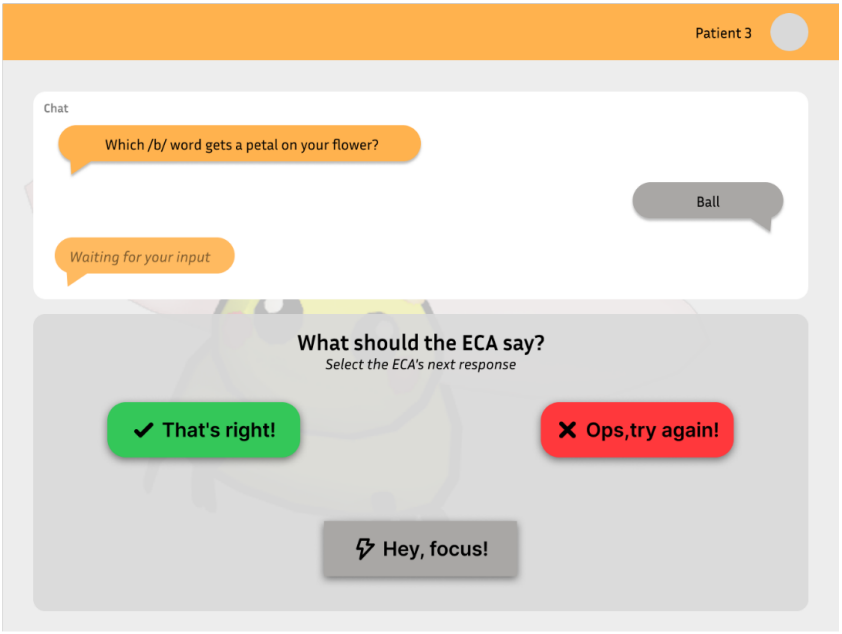

Figure 5: Mockup of the therapists' dashboard

approach to acquiring knowledge through the tangible world. Furthermore, children benefit from multisensory stimulation, which purely digital tools fail to fully provide, as these limit fine motor skills and spatial interaction. The phygital format fosters the triadic relationship among child, technology, and therapist, in which the ECA serves as a support tool for the professional.

In accordance with best practices in Human-Centred Design, clinicians have been involved from the early stages of the research, contributing to the definition of the rehabilitative requirements that informed the game's conceptual and structural design. The present paper reports the design proposal as it emerges from this first phase of the process, acknowledging that further iterative refinement will follow in subsequent stages of development. As future directions, the work moves toward a series of complementary steps: refining the current prototype, conducting a first pilot test with speech therapists to evaluate its integration into the rehabilitative setting in a continuous and non-disruptive manner, and verifying the triadic relationship established among patient, therapist, and ECA during gameplay. Also planned is the design of a shared experimental protocol with clinicians, aimed at assessing the effectiveness of the game in promoting phoneme recognition, in children with primary language disorder, and at identifying the most appropriate measures to evaluate the game's impact on the improvement of phonemic perception.

References

[1] Antoniadou, M., Granlund, M., & Andersson, A. K. (2024). Strategies used by professionals in pediatric rehabilitation to engage the child in the intervention process: a scoping review. *Physical & Occupational Therapy In Pediatrics*, *44*(4), 461-488.

[2] Baumann, A. O., Deber, R. B., Silverman, B. E., & Mallette, C. M. (1998). Who cares? Who cures? The ongoing debate in the provision of health care. Journal of advanced nursing, 28(5), 1040-1045.

[3] Boyle, J., Gillham, B., & Smith, N. (1996). Screening for early language delay in the 18-36 month age-range: The predictive validity of tests of production, and implications for practice. Child Language Teaching and Therapy, 12(2), 113-127.

[4] Calderita, L. V., Bustos, P., Suarez-Mejias, C., Ferrer-González, B., & Bandera, A. (2013). Rehabilitation for Children while Playing with a Robotic Assistant in a Serious Game. In Neurotechnix (pp. 89-96).

[5] Cassell, J. (2001). Embodied conversational agents: representation and intelligence in user interfaces. AI magazine, 22(4), 67-67.

[6] Damaševičius, R., Maskeliūnas, R., & Blažauskas, T. (2023). Serious games and gamification in healthcare: a meta-review. Information, 14(2), 105.

[7] Gamito, P., Morais, D., Oliveira, J., Rosa, P., & Saraiva, T. (2011). Serious games for serious problems: from ludicus to therapeuticus. IntechOpen.

[8] Gelsomini, M., Spitale, M., Beccaluva, E., Viola, L., & Garzotto, F. (2019, March). Reflex: adaptive learning beyond the screen. In Companion Proceedings of the 24th International Conference on Intelligent User Interfaces (pp. 29-30).

[9] Grech, H. (2012). Multilingual children with speech sound disorders: Position paper.

[10] Haerens, L., Bettens, K., Van Lierde, K., & Aelterman, N. (2021). The promise of self-determination theory to study the therapist-client relationship in speech-language treatment. Journal of Communication Disorders, 89, 106059.

[11] Hardecker, S., Schmidt, M. F., & Tomasello, M. (2017). Children's developing understanding of the conventionality of rules. Journal of Cognition and Development, 18(2), 163-188.

[12] Kokol, P., Vošner, H. B., Završnik, J., Vermeulen, J., Shohieb, S., & Peinemann, F. (2020). Serious game-based intervention for children with developmental disabilities. Current pediatric reviews, 16(1), 26-32.

[13] Konnerup, U. (2013). Might Avatar-Mediated Interactions Rehabilitate People Suffering?.

[14] Law, J., Garrett, Z., & Nye, C. (2005). Speech and language therapy interventions for children with primary speech and language delay or disorder. Campbell systematic reviews, 1(1), 1-85.

[15] Lupetti, M. L., Piumatti, G., & Rossetto, F. (2015, June). Phygital play HRI in a new gaming scenario. In 2015 7th International conference on intelligent Technologies for Interactive Entertainment (INTETAIN) (pp. 17-21). IEEE.

[16] Massaro, D. W., & Chen, T. H. (2008). The motor theory of speech perception revisited. Psychonomic bulletin & review, 15(2), 453-457.
[17] McClelland, J. L., & Elman, J. L. (1986). The TRACE model of speech perception. Cognitive psychology, 18(1), 1-86.
[18] McClelland, J. L., Mirman, D., & Holt, L. L. (2006). Are there interactive processes in speech perception?. Trends in cognitive sciences, 10(8), 363-369.
[19] Nijhof, S. L., Vinkers, C. H., van Geelen, S. M., Duijff, S. N., Achterberg, E. M., Van Der Net, J., ... & Lesscher, H. M. (2018). Healthy play, better coping: The importance of play for the development of children in health and disease. Neuroscience & Biobehavioral Reviews, 95, 421-429.
[20] Parmar, D., Olafsson, S., Utami, D., Murali, P., & Bickmore, T. (2022). Designing empathic virtual agents: manipulating animation, voice, rendering, and empathy to create persuasive agents. Autonomous agents and multi-agent systems, 36(1), 17.
[21] Pasqualotto, A., & Filosofi, F. (2023). Tangible digital storytelling and phygital reality: benefits for inclusion and cooperation in young children. REM, 15(2), 41-50.
[22] Rajkhowa, T. (2025, October). Phygital Game-Based Learning in Early Childhood Education: An Exploratory Review. In Proceedings of the 18th European Conference on Game-Based Learning. Academic Conferences and publishing limited.
[23] Saben, C. B., & Ingham, J. C. (1991). The effects of minimal pairs treatment on the speech-sound production of two children with phonologic disorders. Journal of Speech, Language, and Hearing Research, 34(5), 1023-1040.
[24] Simões Araújo, C., Valente, A. R., Costa, L. V., & Silva, S. (2024, December). "Caught in a PICL": Proposal of a Game to Support Language Therapy for Preschool Children. In International Conference on Videogame Sciences and Arts (pp. 84-92). Cham: Springer Nature Switzerland.
[25] Stellini, D., Gatt, D. R., Grech, H., Farrugia, P., & Abela, E. (2025, August). Designing gamified connected tools for bilingual language therapy and education. In Frontiers in Education (Vol. 10, p. 1537079). Frontiers Media SA.
[26] Unicef. (1989). Convention on the Rights of the Child.
[27] Wattanasoontorn, V., Boada, I., García, R., & Sbert, M. (2013). Serious games for health. Entertainment Computing, 4(4), 231-247.
[28] Whittaker, L., Russell-Bennett, R., & Mulcahy, R. (2021). Reward-based or meaningful gaming? A field study on game mechanics and serious games for sustainability. Psychology & Marketing, 38(6), 981-1000.
[29] Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., ... & Council on Communications and Media. (2018). The power of play: A pediatric role in enhancing development in young children. Pediatrics, 142(3), e20182058.