Beit Issie Shapiro
Changing the lives of people with disabilities
On the Willie & Celia Trump Campus

The wonders of technology – the iPad[1] as a tool for promoting participation in aspects of play, leisure, and communication

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In recent years we have seen the development of technology and the considerable impact it has on our everyday lives. Among people with disabilities this has made a substantive change. Professionals in Israel and around the world have begun to take advantage of the iPad as an effective tool for children and adults with disabilities, and its use has become common among this population. Similar to the professional experience acquired by the staff of the Technology Consulting Center[2] at Beit Issie Shapiro, it has been found that use of the iPad encourages motivation and involvement in participating in a variety of activities among children and adults with disabilities (Kagohara, 2013).

Why is the iPad so significant for people with disabilities?

Normativity and popularity: when working with people with disabilities, we often look for ways of maintaining normativity, and for the first time we are using an accessory that is not "unusual" in its appearance or use. This makes it easier for families to acquire and learn how to use it, and also encourages them to use it. This characteristic is also important for the users, children and adults, who enjoy feeling "like everyone". It is also a device that is easily available in many

[1] There are a variety of tablets, but in this review we will focus on the iPad.
[2] The Technology Consulting Center at Beit Issie Shapiro was established to promote inclusion, independence and quality of life for people with disabilities by means of technology. The Center's staff provides consultation and guidance for families of children and adults of all ages in different frameworks, and holds training courses in educational and therapeutic frameworks.

stores, and is relatively affordable. **Portability:** the iPad is relatively lightweight and therefore easy to carry from place to place, and also has many uses in many different environments. **Accessibility**: the device has inbuilt accessibility characteristics. It is easy to operate, and appropriate for use by people with different abilities. **Good quality:** it meets high standards, for example, high screen resolution. **Range of applications:** it is easily and immediately possible to download apps in different fields onto the one device, and use them to practice skills or as a support technology. I**mmediate and meaningful feedback:** provides the user with a sense of efficacy and motivation.

Alongside the many advantages of the iPad there are also limitations, such as the size of the icons, limited suitability for use with a switch, very difficult to use outdoors in sunlight, and limited sound amplification. **The variety of apps and ease of download** leads to "overload" that does not allow work that is focused and appropriate to the user. **Accessibility of apps:** there are many apps that are not accessible to all abilities.

There are also **issues of ethics and professionalism** relating to use of the device, for example: "over-use" or sometimes even a kind of "addiction" are liable to cause a feeling of loneliness and isolation. In addition, advantages such as the availability of the iPad, the multiplicity of supporting apps, the "force of attraction" of the device, and the media exposure that it receives as a tool that can promote people with disabilities, may actually lead to it being seen by many as a kind of "miracle solution" to all difficulties. This approach leads to a situation in which parents, institutions, and therapists purchase it and then suffer disappointment and frustration as a result of not knowing how to use it in an educated way, or when they discover that it is not suitable.

Assimilation of the iPad in the educational framework (special education)

The educational and therapeutic staff plays a central role in assimilating use of the device in the educational framework. The iPad can be a very useful tool for teachers and kindergarten teachers as a tool for organizing lessons, lesson content and so on. Knowledge about adaptations (physical, cognitive, sensory, and technological) and familiarity with the range of apps are important for successful assimilation lessons, and group and individual work.

The iPad can be incorporated in special education frameworks in a variety of ways: in individual and group therapy, as an aid for the teacher or kindergarten teacher, as a tool for communication, and as an aid for organization (such as a visual timetable). Another important use is for communication between the educational framework and the family. The use of photographs and video clips can be a wonderful way of processing and sharing experiences between the children and their families.

Assimilation of the iPad in the educational framework is accompanied by many important issues that need to be considered. There are very important "technical" issues, such as taking care of the equipment, charging it, working with parents, the use of personal iPads, as well as professional and ethical issues relating to the frequency of using the iPad, dealing with behavioral problems, how to decide which children will bring their own iPad from home, and so on.

It is recommended that a professional from the staff should coordinate the subject, thus giving a professional response both to staff and family: a person who will be responsible for in-depth familiarization with the device - its advantages and its limitations. In addition, it is important to get to know the accessories and adaptations available on the market, constantly thinking of new, creative, updated solutions.

By playing with the iPad, it is possible to practice many skills and achieve a range of objectives. We see play as an objective in itself, because it is known that it has a central role in the child's development (Milteer, Ginsburg, & Mulligan, 2012). Participation in leisure activities is important for the quality of life of children in general, and children with disabilities in particular (Pellegrini, Dupuis, & Smith, 2006; Shikako-Thomas et al., 2012), and not only as a means to an end.

In this review, we will focus on use of the iPad as a tool for promoting participation in play, leisure and communication. In addition, at the end of the review you will find a list of the apps mentioned here.

The term participation is defined as a person's deep involvement in the different situations making up the fabric of life, in other words, a wide range of occupations. It is taken from the basis of the bio-psycho-social approach to health, presented in the Classification of Functioning, Disability and Health International (ICF) model, published in 2001 by the World Health Organization (WHO, 2001), and adapted as a guiding professional model for occupational therapy in Israel in the document "The Israeli Adaptation of the Occupational Therapy Practice Framework". The areas of occupation defined in this document include basic everyday activities, instrumental daily activities, studies, work, play, leisure, and social participation (Yalon-Chamovitz, Sachs, Weintraub, Nota, Mazor et al, 2006).

In this article **we will relate to play** as an action usually driven from an inner source and providing pleasure, entertainment and learning. Play activity takes place in the mental space between reality and imagination. **Leisure will be defined** as an activity without commitment, driven by an inner need, and taking place at a time that is not set aside for work, self-care, or sleep (Yalon-Chamovitz et al., 2006).

How does the iPad promote participation in play?

Use of the iPad for play will be defined as use without the aim of practicing a learning task or for communication, but purely for pleasure, and driven by an inner (and not external) need. It is important to point out and emphasize the importance of tangible play that is not virtual (in sensory, motor, cognitive, emotional and social terms), and the fact that the professionals must enable and encourage play of this kind as much and far as is possible.

Many children and adults with complex cognitive and motor disabilities show passive behavior patterns, and it seems difficult to find play objects that will motivate them to be actively engaged in a game. For many of them, the iPad serves as a tool for independent activity and investigation that is not seen in other situations. The iPad can bridge difficulties (motor or cognitive) and enable the child or adult with disabilities to play. Children with motor difficulties often experience considerable frustration over the gap between their relatively high cognitive

abilities, and their functional capabilities. For some of these children, playing with the iPad offers them an age-appropriate activity, reduces their need to be dependent on their environment, and allows them to investigate in a way that they were previously not capable of. So a child with a motor disability (due to cerebral palsy, for example), who has difficulty with hand function, will probably not be able to build with building blocks or play a game of imagination with dolls and cars like other children without disabilities. But it is possible that this child's hand function is sufficient for playing imagination games on the iPad, or assembly games, and so on. Even among children and adults with intellectual and developmental disabilities (IDDs) we often see a difficulty with play. This can be expressed as limited initiative, limited degree of persistence, and low level of play. We have found that the characteristics of the iPad, such as the immediate visual and auditory feedback, the portability of the device, the range of apps, and so on, encourage use and investigation. Children and adults who have not shown interest in other games, or who have shown a low level of play (repetitive and not guided play, for example) have expressed interest in games on the iPad. Sometimes this was manifested in the fact that they showed initiative, played a game in a deliberate manner according to the objective, from start to finish), and even investigated and learned by themselves how to use the device. There have been cases where they showed and even developed capabilities that they had not shown previously, for example in cognitive games such as matching and puzzles.

Use of the iPad for play

The iPad can be used as an accessory for a tangible game. There are apps that can substitute for dice (such as the Photo Dice app), a spinner (such as Image Spinner), or a spinning top (like the iGevalt app) at Chanukah, for children who cannot use the tangible object due to motor difficulties.

Apps resembling "tangible" games

Today there are many apps based on familiar games, such as Four in a Row, Noughts and Crosses, Rush Hour, memory games.

There are a range of good imagination games, such as games resembling a kitchen, a hairdresser's salon, various everyday activities, and so on; for example the games made by Toca Boca – Pepi Doctor, Pepi Bath, My PlayHome, PlayHomeStore.

Usually, during therapy the aim is to create a "transition" to the natural environment, sometimes by repeating play designs from the iPad and also when using "regular" play objects.

Age-appropriate play: as children with disabilities grow, so does the challenge of finding games appropriate to their age. The iPad has no age, and in that respect it provides an appropriate solution because it suits all ages. Children of any age can play with the iPad, feel like everyone else, and even arouse envy among others because "they have an iPad". Playing with a normative and popular tool (Kagohara et al., 2011) helps integration in the community and many parents also report an improvement in the child and his or her siblings playing together.

When working with adults, it is important to ensure the use of age-appropriate games. This is the biggest challenge with adults with IDDs. It is important to match the app to the user's level, and not choose one that is too childish. One example of a good app for this purpose is Kids

Puzzles – African Plains, a puzzle game with photographs of animals that is appropriate for all ages. It is possible to define the number of pieces, and also import personal photographs. The app comes from the outstanding company Grasshopper. Many apps from this company offer the possibility of changing definitions, thus matching the games to different levels. Unfortunately, there are not a lot of pictures in apps of this kind, and so sometimes we use "open" apps in which pictures, text and recordings can be independently inserted, like Tiny Tap and Bitsboard, and it is also possible to build and adapt games for adults.

There also apps for traditional games, such as card games and other thinking games (crossword puzzles, Sudoku, and so on) that are appropriate for adults and can provide an answer for leisure time.

Using the iPad for leisure

Many people use tablets of different types as a leisure time occupation. For people with disabilities, this is sometimes the only tool with which they can occupy themselves normatively in their leisure time. The iPad has a variety of possibilities for leisure activities: listening to songs and stories, reading a book or magazine, listening to radio programs, lectures, and so on. Books play an important role in linguistic, cognitive, and emotional development (Pollard-Durodola et al., 2011), and the ability to look at and read a book on the iPad allows many people to benefit from the advantages of the book without opening a printed copy. For example, a child or adult who cannot enjoy reading a book because he or she is not able to read, or cannot hold the book, can enjoy listening to a story on the iPad. There are a number of recommended apps in this context: "Ivrit" – Hebrew digital books, iCast – spoken books, radio programs, and so on, "Ivrit for children" – a library of interactive Hebrew digital books, Touchoo.

For adults, use of the iPad in leisure time can also promote social skills and reduce the sense of isolation, through keeping up with what is going on in the country and around the world, and also through immediate and easy communication with friends and family members with applications such as Skype, Facebook, or e-mail.

The iPad as a tool for promoting communication

With the introduction of portable technology into our lives, we are seeing changes that affect our ability to communicate with others: today, in order to talk to a friend, all we have to do is press a button on our telephone and tell our friends about our experiences – we do not necessarily need paper, pen, and a stamp. It is possible to make quick contact with another person on the other side of the world – to write to them, to pass on information in seconds, and even talk to them "face-to-face" by video chat. The technology helps us and enables us to do things that took a lot longer in the past, and were harder to achieve. It sometimes seems that we were born with smartphones, computers, and tablets, and yet, for people who speak and write, the technology is merely a tool allowing additional circles of communication in a more efficient and faster manner. For people with disabilities, use of the prevailing technologies for communication opens a door that, in the past, was almost closed to them. Technology, with the variety of opportunities it offers, can improve the communication capabilities of people with disabilities (McNaughton & Light, 2013). For people who have difficulty speaking, the technology is not only an additional means to make their communication easier and more effective, it can

also serve as a substitute for the usual form of communication between people – speech, or as a means of supporting their methods of communication. In this way, the technology helps overcome disabilities and break down barriers, allowing many people to be real participants in society and debate.

The use of technology to create a system of augmentative and alternative communication (AAC) for people with difficulty producing speech is not new. However, tablets, and foremost among them the iPad, have succeeded in generating a real revolution in everything relating to the use of AAC systems. As mentioned, the iPad is a tool with many advantages for people with disabilities (McNaughton & Light, 2013). Its availability, size, weight, ease of operation, and in particular its price has made it one of the most popular AAC tools. Additionally, thanks to its many advantages, it also offers other communication solutions for people with disabilities.

The iPad as an augmentative and alternative communication system (AAC)

Use of the iPad for AAC is usually in combination with designated AAC apps that are personally adapted, and, like speech, produce vocal messages. These apps make it possible to build communication boards, each one having words or universal symbols representing words. By pressing on the symbol or word a message is produced, and in this way many people are able to express their wishes and feelings effectively and receive the appropriate attention due to them from those around them.

Adaptation of an AAC system on the iPad requires planning and thought: it is necessary to take into account both the capabilities of the user, and the ability of those around them to maintain the AAC system – to build boards, enter new messages, and so on.

There are many AAC apps, although the supply in Hebrew is limited. For small children or people who do not read, we usually recommend apps with a system of symbols (pictures) and an inbuilt speech engine which usually make it much easier to build boards for the user (there is no need to take photographs and record each message), and to enable a good user experience. For teenagers and adults who can read, it is possible to build complex boards from written words. The TouchChat app is marketed In Israel, enabling boards to be built with symbols or words, and messages in Hebrew.

For adults who can write, we can recommend an AAC app designed like a keyboard and including a speech engine, such as the “Kol Ivri” app with which messages can be typed in, and 16 permanent pre-recorded messages can be stored. (There are other AAC apps that can be used, which will be presented in an appendix).

At the same time, as noted, the capabilities of each individual user must be taken into account. Therefore if the user also has a motor disability it is necessary to consider whether the iPad meets all his or her needs.

One of the disadvantages of using the iPad as a means of AAC actually lies in its essential nature as a multipurpose tool. The iPad is used as a substitute for play, as a camera, a book, and so on. Unfortunately, because it is still not possible to open two apps at the same time, it is not possible at present for a person with speech difficulties to talk using the AAC app while playing / reading / taking a picture. It is to be hoped that with the technological advances, this matter will

soon be resolved. In addition, among some potential AAC users the temptation to play on the iPad at any given moment may sometimes come at the expense of their wish to communicate and share, and for this reason it is necessary to emphasize adaptation of the device to the unique character and capabilities of each user.

The iPad as a means of communication and a tool for sharing experiences

The iPad offers other communication solutions for people with difficulty producing speech and with communication. In addition to being an AAC device, the iPad allows users to communicate easily through a variety of apps that it contains, and to include others in their lives. So, for example, the iPad makes it possible to pass messages between people instantly – similar to SMS texts on the cellphone: for example, using an app called OlaMundo it is possible to send and receive messages made up of symbols (from a set of symbols / pictures). In this way, users who cannot read and write can also send and receive instant messages from their friends, made up of a series of symbols.

Furthermore, the iPad and its video camera can be a wonderful tool for sharing experiences. For people who talk in sign language it can serve as a "telephone" with apps like Skype or FaceTime. And for people who do not communicate using words or signs, these apps make it possible to share experiences instantly. They can communicate with their friends through the apps, and take pictures during an event. In this way, through the lens of the camera, they can share their everyday experiences with the people around them just as they themselves experience them.

The regular camera also has many advantages that can help users with difficulty producing speech to share their experiences. For example, taking the photographs of the day's events in the educational framework or occupational center makes it possible to share the experience and discuss these events when the user returns home to his or her family, and the reverse – sharing events at home or in the evening with friends from the center.

Recording a voice message by a teacher, activity supervisor, or family member also allows a person with speech difficulties to share experiences with others. It is possible to record voice messages in apps such as PlayButton or iSpeak Sequences, and in most designated AAC apps.

Another possibility is to prepare an album of pictures accompanied by spoken messages describing an experience. In this way, it is possible to create many stories and enable users to share a different experience each time, as they choose. Albums of this kind can be created with the Story Creator and Tiny Tap apps.

In conclusion, the iPad was not created for people with disabilities, and for just this reason it leads to a significant change in their quality of life. For the first time professionals in the field of disabilities are working with a normative device and this has many advantages, in particular relating to the availability of the device and the desire of the people around us to use it. Guidance and close accompaniment of users and their families is of great importance. It is also important for professionals to learn to use the device properly, and for training to be given in connection with use adapted to the user and the environment, rather than just a recommendation of the device and list of apps.

The iPad has brought with it a change in quality of life among people with various disabilities, in a variety of ways. In this article we have chosen to focus on play, leisure, and communication among children and adults with motor and cognitive disabilities, but a great deal has been done also in other fields, and with other disabilities. It should be remembered that, like any other tool, the iPad also has limitations and it is necessary to know what they are. It is important to continue studying the use of the iPad, and work on developing models for the right way of working and using the device intelligently.

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References

Yalon-Chamovitz, S., Sachs, D., Weintraub, N., Nota, A., Mazor, N., et al. (2006). *Space and Process of Professional Action in Occupational Therapy in Israel*. Tel Aviv: Israel Society of Occupational Therapy. [Hebrew]

Kagohara, D. M. (2011). Three students with developmental disabilities learn to operate an iPod to access age-appropriate entertainment videos. *Journal of Behavioral Education, 20*(1), 33-43.

Kagohara, D. M., van der Meer, L., Ramdoss, S., O'Reilly, M. F., Lancioni, G. E., Davis, T. N., ... & Sigafoos, J. (2013). Using iPods® and iPads® in teaching programs for individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities*, 34(1), 147-156.

King, G., Petrenchik, T., Law, M., & Hurley, P. (2009). The enjoyment of formal and informal recreation and leisure activities: A comparison of school-aged children with and without physical disabilities. *International Journal of Disability, Development and Education, 56*(2), 109-130.

McNaughton, D., & Light, J. (2013). The iPad and mobile technology revolution: Benefits and challenges for individuals who require augmentative and alternative communication. *Augmentative and Alternative Communication, 29*(2), 107-116.

Milteer, R. M., Ginsburg, K. R., Mulligan, D. A., Ameenuddin, N., Brown, A., Christakis, D. A., ... & Swanson, W. S. (2012). The importance of play in promoting healthy child development and maintaining strong parent-child bond: Focus on children in poverty. *Pediatrics, 129*(1), e204-e213.

Pellegrini, A. D., Dupuis, D., & Smith, P. K. (2007). Play in evolution and development. *Developmental Review, 27*(2), 261-276.

Pollard-Durodola, S. D., Gonzalez, J. E., Simmons, D. C., Kwok, O., Taylor, A. B., Davis, M. J., ... & Simmons, L. (2011). The effects of an intensive shared book-reading intervention for preschool children at risk for vocabulary delay. *Exceptional Children, 77*(2), 161-183.

Shikako-Thomas, K., Dahan-Oliel, N., Shevell, M., Law, M., Birnbaum, R., Rosenbaum, P., ... & Majnemer, A. (2012). Play and be happy? Leisure participation and quality of life in school-aged children with cerebral palsy. *International Journal of Pediatrics, 2012*.

World Health Organization. (2001). *International classification of functioning, disability and health (ICF)*. Geneva, Switzerland: Author.

List of apps mentioned in the review

Field	Name and icon of app	Description
Aids for tangible play	Photo Dice	Dice substitute for games. The pictures on the dice can be chosen.
	Image spinner	Substitute for spinner
	iGevalt	Touching the screen makes the top spin
Substitute for familiar games	Rush Hour	The familiar game in which the red car has to be extricated from the traffic jam
	Memo Game	Memory game for children
	Matches 2	Memory game for adults
Imagination play	Range of games by Toca Boca	Imagination games with a wealth of characters and items, and a sense of humor. For example: preparing food, hairdresser, imaginary city
	Pepi Bath	Imagination games relating to everyday life: bath, toilet, washing hands, and so on
	Pepi Doctor	Imagination game involving a child going to the doctor – there are a number of activities to choose from
	My PlayHome	Imagination game in which it is possible to play with a number of family members in different rooms of the house. Almost any touch on an object on the screen activates it
	PlayHomeStore	Imagination game in which it is possible to play with a number of family members in different stores. Wide range of activities

Leisure	Kids Puzzles – African Plains	Puzzle with photographs of animals. The level of difficulty can be defined, and personal photographs can be imported
	Ivrit	A range of apps of well-known stories for adults
	Ivrit for children	A range of apps of well-known stories for children. The story in the app looks exactly like the printed book and it is possible to listen to it or read it alone. Games are incorporated in the story
	Touchoo	A range of apps of well-known stories for children. The story in the app looks exactly like the printed book and it is possible to listen to it or read it alone. Games are incorporated in the story
	iCast	Listen to stories, lectures, radio programs, and so on
Communication	TouchChat	An app with which to build complex communication boards, including the SymbolStix database of symbols and a speech engine in Hebrew
	My Talk Tools	Enables a basic communication board to be built. SymbolStix symbols database. Voice messages should be recorded
	Sounding Board	Allows a preliminary communication board to be built
	Pogo Boards	For building communication boards. SymbolStix symbols database. Editing the boards with the computer
	Kol Ivri	"Speaking keyboard" – allows messages to be read out loud (large / small). For users who are literate or in the process of acquiring reading and writing
	PlayButton	An app enabling voice messages to be recorded
	iSpeak Sequences	An app allowing a number of voice messages to be recorded and played back in sequence
	Skype	An app for communicating with friends and holding video calls

	FaceTime	An app for communicating with friends and holding video calls
Open apps	Tiny Tap	A platform for creating and voice albums, scene panels and games
	Story Creator	An app for creating albums. Voice messages can be recorded to accompany the pictures