14 Inclusive Digital Technologies for People with Communication Disabilities

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Abstract
Suffering from communication disabilities limits a person's ability to participate in communicative and social interactions, public democratic debates and learning activities. The possibility of trying out ideas and opinions is weakened and it might have an impact on the ability to tell one's life story and to process inner thoughts. Consequently, it may affect the sufferer's self-understanding and lead to psychological problems. If it is not possible to find alternatives and compensation strategies for telling your story, presenting who you are, and participating in meaningful dialogues, it is likely that your intellectual level will gradually decrease. Advances in information and communication technologies (ICT), such as smartphones, tablets, and Internet connectivity, have contributed to the integration of many aspects of communication and learning strategies. Thus, new methods to enhance inclusion and empowering people with communication difficulties are offered. However, more knowledge about how learners with special challenges benefit from ICT in their communication and learning and what kind of technology that qualify rehabilitation is needed. Based on research with people suffering from aphasia after a brain injury this chapter will demonstrate how digital technologies can support sufferer's in acquiring some new ways to re-engage people in communicative relations and learning activities.

Keywords: Communication disabilities, Inclusion, ICT, Identity-formation learning, Empowerment, Participation

14.1 Introduction

In recent years, digital technologies have developed rapidly, leading to new features and possibilities within different learning arenas and for different groups of learners. Whether digital technologies enhance the learning and increase the outcome is a complex issue to measure, some will argue even impossible (Passey, 2013, p. 2). Ross, Morrison & Lowther (2010) conclude in a research on past and present technology mediated learning that "educational technology is not a homogeneous 'intervention' but a broad variety of modalities, tools, and strategies for learning. Its effectiveness, therefore, depends on how well it helps teachers and students achieve the desired instructional goals" (Ross, Morrison & Lowther, 2010, p. 19). Tamim, Bernard, Borokhovski, Abrami, & Schmi (2011) agree by stating that the contribution of digital technology in education depends on a range of factors such as context, persons and pedagogy (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011, p. 17). To get an insight into how technologies contribute to learning it is recommended to conduct research within each of the mentioned factors (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011).

Learners are not a singularity. In the Danish primary school and within education for special needs an individual lesson- and education plan must be written for every pupil (Ministeriet for Børn, Undervisning og Ligestilling, 2016) and every pupil must learn "as much as possible" (Undervisningsministeriet, 2010). In a UK educational context The Department for Education

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have similar recommendations “learning should accommodate learner´s individual needs, their interest and aptitude, so they can gain to the greatest possible level (Passey, 2013, p. 103). Learners with limited opportunities are widely different depending on their specific cognitive, physical, socio-emotional challenges. However, their needs and potentials benefits from digital technology mediated learning are insufficient in the research literature. Developing scientific grounded approaches to teach and learn within an increasingly digitalised, world learners with special needs must not be neglected.

The digitalisation of learning and communication have indeed a potential to change the lives of people with communication disabilities by compensating or substituting for their disabilities. A wide range of digital tools and software enable the use of multiple ways of communication (voice, text, and gestures, emoji’s and symbols) and the Internet and web 2.0 facilitate engagement with others, getting access to information and knowledge and hence facilitate communication, interaction, and learning.

The Convention on the Rights of Persons with Disabilities (2006) is addressing the rights and needs of persons with disabilities. The role of ICT is promoted as a disruptive force in enabling the inclusion of persons with disabilities across life domains. ICT is specifically identified as an enabler for accessibility to systems and services, for access to information, to uphold freedom of expression, and to meaningful habilitation and rehabilitation. (United Nations, 2006). Several articles raise the need of affordable and accessible technology to realize the rights of persons with disabilities. Central is article 21, Freedom of expression, opinion and access to information, which says:

> States Parties shall take all appropriate measures to ensure that persons with disabilities can exercise the right to freedom of expression and opinion, including the freedom to seek, receive and impart information and ideas on an equal basis with others and through all forms of communication of their choice, as defined in article 2 of the present Convention, including by: (a) Providing information intended for the general public to persons with disabilities in accessible formats and technologies appropriate to different kinds of disabilities in a timely manner and without additional cost; (b) Accepting and facilitating the use of sign languages, Braille, augmentative and alternative communication, and all other accessible means, modes and formats of communication of their choice by persons with disabilities in official interactions. (United Nations, 2006, Article 21)

The European Commission (EU) mentions people with disabilities in their Disability Strategy 2010-2020 and eight areas for action are identified: Accessibility, Participation, Equality, Employment, Education and training, Social protection, Health, and External Action in which ICT is considered as a key tool for inclusive education and for promoting equity in educational opportunities for people with disabilities (Europa Commission, 2015).
Even though the UN and EU have strategies for inclusion of people with disabilities and have visions of ICT as an enabler to empowerment and learning, many people face barriers in their everyday lives that make it difficult for them to participate fully in their communities due to communication disabilities.

This chapter will contribute to the research field of digital technologies and learning, particularly emphasising the needs of learners with specific challenges, through findings from two research cases. Both cases concern people with communication disabilities after a brain injury, aphasia, and how web-based environments are used in the rehabilitation. Case 1 is about a web-based virtual environment, case 2 is on rehabilitation in an immersive virtual environment.

14.2 Identity and Learning

Communication plays a major role in identity formation and according to social learning theories, learning and identity-formation are closely linked (Vygotsky, 1934). Identity is created through communication and collaboration in communities and must be maintained and sustained throughout a person's life, retold through language with narratives and images. Inspired by Vygotsky, Lave and Wenger (1991) introduced the concept of situated learning. They emphasize that knowledge and skills must be contextualized and pedagogically structured as reflections of everyday situations and that learning is a process where the learner becomes involved in a community of practice, representing beliefs and behaviours. Situated learning theory is in line with Vygotsky's social development theory (1978), where he claims that social interaction plays a fundamental role in the development of cognition, language and identity. Besides considering learning as a means of developing practice, learning can also be viewed as a means of development and change of identities (Wenger, 2000). It is crucial for learning, identity, and self-esteem to be part of a community, both with peers and with family and friends. Three focal points of communities of practice are 1) a shared repertoire, 2) a joint enterprise and 3) a mutual engagement. In a virtual community of practice people have the opportunity to share experiences, meanings, and repertoire, and thus create a shared history a shared culture.

14.3 Cases

Both cases were part of research projects conducted as cooperation between "The Institute for Language, Speech and Brain disorders" in Aalborg and Aalborg University. Data from case 1 were collected in 2006, whereas data from case 2 were collected in 2011. In both cases the research method were qualitative and phenomenological inspired – which means though qualitative interviews, focus group interviews virtual ethnography.

14.3.1 Aphasia

To understand the group of learners it is important to understand the implications and the diversity of aphasia. Aphasia is an impairment of the language functions due to a brain injury. Aphasia takes many forms and influences a person's ability to produce and understand speech/language, to read, write, spell, and calculate. Aphasia may also be accompanied by other disorders, such as paralysis, cognition problems, and a lack of concentration. People with aphasia often exist in worlds of chaos and confusion, in which language and interplay with surrounding environments are shattered (Hjernesagen, 2016; Konnerup, 2015).

To suffer from aphasia after a brain injury is first and foremost associated with limitations in speaking and understanding spoken language. Though, the consequences and constraints are far-reaching. Language and processing language influence identity formation. Suffering from aphasia often prevents the person from being an active citizen and family member, and most significant is that people with aphasia (PWA) feel a loss of identity (Konnerup, 2015; Shadden & Agan, 2004). Communication disabilities is often interpreted as a loss of competencies and ability to take responsibility for oneself and others (Worrall et al., 2011, p. 309). For this reason, PWAs are at high risk of being marginalized and socially excluded (Shadden, Hagström & Koski, 2008).

Suffering from communication difficulties might have an impact on the ability to tell one's life story, process inner thoughts, and thus, may affect the sufferer's self-understanding and lead to psychological problems (Simmons-Mackie & Elman, 2011, p. 314).There is great risk that PWAs will experience changes in the ways people relate to them after the brain injury. It becomes difficult to maintain social relationships so their greatest loss is often a reduction in the fluidity and flexibility in which communication allows navigation of the complex challenges of life's social actions and interactions. Loss of communication competence has crucial implications for social life, identity, thinking, cognition, and learning. The loss reduces intellectual activity since the brain might be used less, especially if a person has dropped out of the labour market (Konnerup, 2015). If it is not possible to find alternatives and compensation strategies for telling your story, presenting who you are, and participating in meaningful debates, it is likely that your intellectual level will gradually decrease. "It is often said that a person's language is at the level of his intelligence. It is probably largely correct. But the opposite also applies: Your intelligence is on par with your language" (Goldberg, 2005, p. 109). Thus, it is crucial that rehabilitation facilitates alternative ways of communicating, presenting oneself and developing new forms of action.

The research by Worrall, Sherratt, Rogers, Howe, Hersh, Ferguson, and Davidson (2011) about what PWAs really want according to WHO´s International Classification of Functioning, Disability and Health (ICF), demonstrates that their primary goal in the different stages of rehabilitation is to get re-engaged in social and family activities (Worrall et al., 2011, p. 309). For decades, researchers and practitioners have focused on the psycho-social aspects of living with aphasia and have been working on interventions to re-connect PWAs to social life (Parr, 2007; Pound, 2000). There is an emerging theoretical shift from focusing on recreating and relearning the lost language to also incorporating quality of life and participation in society as part of rehabilitation. Though, research on the impact, concrete interventions, materials, and resources for ICT-mediated rehabilitation are still needed.

14.3.2 Case 1

The objectives of this case were to establish video-conference-based distance learning services for PWAs to extend and improve their rehabilitation. The specific aims were to give PWAs the opportunity to learn or relearn ICT, to increase their overall communication skills, to strengthen their participation in public debates and to increase their self-reliance in relation to e-commerce and e-banking (Dirckinck-Holmfeld, Konnerup & Petersen, 2004). The speech therapy was conducted via synchronous videoconferencing, and the weekly assignments were sent by email beforehand. The project developed over time. From using expensive videoconferences and email, to using Internet-based Skype.

Because of a midterm evaluation noticing that is was difficult for the PWAs to navigate between different icons as e.g. Internet Explorer and Microsoft Mail, which were very alike, a web based learning environment, called Basecube, was designed especially for the PWAs needs. The PWAs put special demands to the interface design. It must be easily accessible, user-friendly and dynamically adapted to the individual´s needs and disabilities. To meet any cognitive problems, all features in BaseCube are viewable in one personal entry (Figure 14.1). By using pictures, colors, and icons the design should trigger the user to get ideas, remember, interact, manipulate, experiment, affect emotions and stimulate to act BaseCube integrated dynamic tools which made it easier to navigate among email, exercises, news, calendars,

forums, etc. The courses were orchestred by the speech therapist and the content was a mix of individual exercises and debating points for the whole group of participants.

There are 3 kinds of debate in Basecube, marked with different colors. One used for the one-one communication that takes place in relation to training between PWA and speech therapist; a second that serves for dialogues in the community and a third for discussions related to an article.

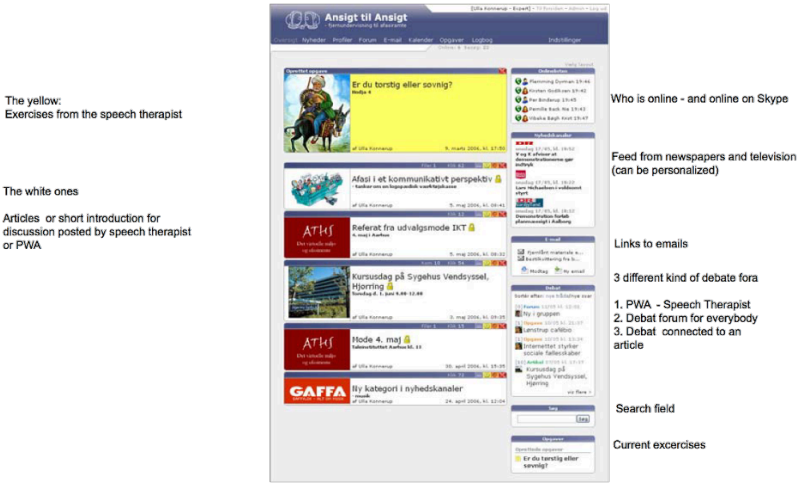

Figure 14.1: Screenshot of a personal start interface of BaseCube (URL: private).

Besides the personalized entry, every participants in BaseCube had the possibilities to present themselves by making a profile. It was visible for all participants in BaseCube, with links to relevant data, audio and written blogs, and important sites. PWAs and 6 speech therapists were users of BaseCube in the project period.

Figure 14.2: Screenshot of a profile in BaseCube (URL: private).

14.3.3 Lessons Learned

Research results from case 1 indicates that interacting with and participating in a media-rich web-based community of practice strengthen cognition, communication, and, in a broader sense, personal and social mastery (Konnerup & Schmidt, 2006). The web-based training was flexible and promoted motivation and commitment. There was a high degree of involvement from the PWAs' relatives (Dirckinck-Holmfeld et al., 2004).

Evidence based research on the impact of rehabilitation has suggested that intensive intervention (i.e., eight hours or more per week) is necessary to gain language improvement (Bhogal, Teasell, Foley & Speechley, 2003; Cherney & van Vuuren, 2012). In a traditional rehabilitation course with attendance at the rehabilitation centre it is both expensive for society and exhausting for PWA to engage in that many sessions of interventions. Case 1 addresses this need for high-intensity training. A focus interview with the participants revealed that they spent up to six hours a day training using features afforded in BaseCube orchestred by their speech therapist (Konnerup & Schmidt, 2006, p. 116). The project participants expressed great satisfaction with the web-based training, especially the activities in BaseCube and what the activities led to on the Internet. In the interview the PWAs highlight the importance of a single point of entry for both Internet, mail, exercises, newsfeed and communication (Dirckinck-Holmfeld et al., 2004)

Originally, Basecube was mainly considered for formal learning. Over a very short period it, however, turned out to become a social community for the PWA. They felt secure in the Basecube environment and they were attracted to the discussion fora it possible to communicate with pictures, photos, movies, or audio. Newsfeed to their preferred newspaper awakened their curiosity, one link led to another and they got occupied surfing on the Internet, which had seemed too difficult for them beforehand. As a part of the research the researchers and the PWAs discussed BaseCube and what it had meant to the users in a discussion fora. The following outline represents three statements from different PWAs:

> BaseCube have taught me to watch video (on the Internet) the whole night - ironman on Hawaii/ New Zeeland, because I and can search the internet, I´m no longer afraid to do anything wrong – I know how to save things on the Internet. I dare to make a fool of myself – that makes my wiser. My curiosity, the safeness, and my eager to be with other people is driving me. (PWA 1)
>
> Being busy with the filler (she is reconstructing her house), I MUST have a look on our site - what is going on, what are you doing. Basecube has become a part of my life, I´m addicted. (PWA 2)
>
> BaseCube is GOLD. I´m agreeing with you, O - and well written. When I started this course, I could not find my passwords, my usernames, the digital language and so on - I pressed the wrong bottom and I could not surf the internet. I was exhausted. But now - awesome - I couldn't live without Basecube - my workplace - a very vivid workplace. (PWA 3)

Using words as *our place* and *my workplace* and commenting on each other's contributions to the debate makes it obvious that they feel personally committed. BaseCube have defined the Internet, rehabilitation exercises, and emailing and made it manageable.

The relatives expressed great enthusiasm that PWAs were up to date with news, and could do some of the tasks they had in the family before, e-shopping, e-bank etc. It balanced the division of labour in the family. Finally, the research revealed that the ICT-mediated training enabled the PWA to negotiate their identity, by showing who they were and had been using pictures in blogs, debate fora and chats (Dirckinck-Holmfeld et al., 2004; Konnerup & Schmidt, 2006).

BaseCube is developed in 2004, the same year as Facebook, but before it was known publicly. 2004 was also the year that the concept of digital social media are reflected both in research and in the general public and related to the term web 2.0 (Klastrup, 2016) As mentioned BaseCube has a lot of the same features and tools as the significant characteristic of social media. It allows user generated content accommodated to a variety of technologies and features for communication and learning practices (Dalsgaard & Sorensen, 2008). Several Web 2.0 services are often centred around the individual's profile and a personal network of people. It is possible to create smaller or larger groups for private activities. With a personal network, it is possible to share different types of content produced by the user, e.g. pictures of family, status updates recipes, holidays, small movie.

Summing up the findings from case 1, besides formalized speech therapy, BaseCube provides many options for communication and learning. According Konnerup & Schmidt (2006) the participants:

1. Communicate and learn by various forms of perception and modalities;
2. Interact with people at their same standing;
3. Can choose between various learning and communication strategies;
4. Get an opportunity for self-reflection and self-presentation via profiles and weblogs;
5. Get an increased extent of independence;
6. Get a strengthening of cognitive functions;
7. Become able to take responsibility for their own learning and the sense of being a part of and being “present” in a community of practice.

Several of the features in BaseCube are similar to what social media offer today.

14.3.4 Case 2

Case 2 concerns a six-week rehabilitation online course for 9 PWAs, conducted by 6 speech therapists. The course was a part of a project on offering speech therapy in the immersive virtual world, Second Life (SL).[14] It comprises the development of an avatar[15]-mediated rehabilitation and the initiative is based on experiences from case 1. The results of case 1 revealed that web-based learning environments with tools and features like in social media had a potential to stimulate communication, interaction and learning by using various forms of perception and modalities with peers and speech therapists. Web-based communication training from own home enable PWAs to take responsibility for their own learning. In case 2 the learning environment is 3D. By letting the participant be represented by a virtual human, a so-called avatar the feeling of presence should be strengthened and invite to more immersiveness in the scenarios and narratives. The objective was to investigate whether being able to do things like horse-riding, shop new shoes, windsurfing or travel to Paris virtually could stimulate the brain and consequently the language and the ability to renegotiate the identity. The courses were based on social interactions and activities in a community-centred perspective.

[14] See Article `Second Life´ in Wikipedia, the free encyclopedia. URL: http://en.wikipedia.org/w/index.php?title=Second_Life&oldid=653591747. Last accessed: 27 May 2017.

[15] A visual representation of a person (Internet user), e.g., in the form of a cartoon character, a three-dimensional figure, or a photo of oneself.

SL is a free online world that people can enter, explore, and interact in by accessing the Internet. Using a keyboard and mouse, the users control a graphical digital representation of themselves: an "avatar" (Carr & Pond, 2007, p. 34). The easy web-based access from home computers makes SL fit for rehabilitation. SL is, in many ways, a virtual replica of the real world. It is possible to personalize a user's environment with a small amount of money. Some would argue that the graphical appearance could be more realistic; however, research has shown that a photographically real display does not increase users' feelings of social presence more than other parameters, such as minimal cues (Sanchez-Vives & Slater, 2005, p. 337). The person that controls an avatar can decide its behaviour and personalize its appearance. Age, gender, race, height, and weight can be changed with a few mouse-clicks. It is possible to rent or buy land, build houses, buy spaceships and much more. Avatars can fly and teleport, giving the user a degree of self-control and self-representation. SL is, without comparison, the virtual environment with the most users and is the most frequently referenced in research. It was founded by Linden Lab in San Francisco in 2003. By 2014, there were more than one million regular users (`residents´, as they are called, `Second Life´, 2015). During the project the primary learning space in SL was a place called Wonderful Denmark (WD). The design is based on a very well-known (in a Danish context) fictive provincial town called Korsbæk. Korsbæk is known from a television series called Matador, which first aired on Danish television in 24 episodes from 1978 to 1981. The series is about life in a small town, and you follow the town's inhabitants from 1928 to 1947. Korsbæk has become a shared heritage for most Danes.

Figure 14.3: Screenshot of a very known shop in Korsbæk in Second Life: Wonderful Denmark, 2010.

Environments like SL offer such features as embodiment, presence, collaboration, user-centeredness, context-awareness, and cross-real interactions to enhance users' learning experiences. Through avatar mediation, the environment stimulates bodily immersion and interaction, affording users the semantics of place, including deixis, indexical language, and body orientation (Rehm & Konnerup, 2012).

14.3.5 Lesson Learned

The research data in case 2 were collected partly as qualitative interview with 10 participant and 6 speech therapist, partly by virtual observations of online training sessions, which also were videotaped. The data revealed that the PWAs to great extent were capable of immersing themselves in the interactions and scenarios of SL, leading them to experience a high degree of presence (Konnerup, 2015). By offering a variety of ICT features and multimodal communication tools and by meeting a variety of perception modes, the virtual environment

offers a possibility to act and communicate. The avatar mediated rehabilitation has shown to facilitate alternative ways and compensation strategies for telling your story, presenting who you are, participating in meaningful social interaction cognitive training, and renegotiation of identity. The embodied interactions and the feeling of immersiveness and presence seem to prompt words and interactions. Immersiveness is the subjective impression in a comprehensive and realistic experience (Dede, 2009, p. 66). Sensory information causes users to forget that they are in a mediated environment, leading them to believe and behave as if they were in the real world (Sanchez-Vives & Slater, 2005, p. 332; Schroeder, 2010, p. 3; Slater, Usoh, & Steed, 1994). Immersion can lead to presence, which is "a state of consciousness that may be concomitant with immersion, and is related to a sense of being in a place" (Slater & Wilbur, 1997, p. 1). In brief, one could say that presence is how immersion makes you feel. Schroeder (2010) noted that, in the context of virtual environments, "the feeling of ´being there´ makes users feel they are together in the same (virtual) space" (Schroeder, 2010).

Horse-riding is one of the activities that is mention in by the PWAs that make them feel present and make them feel immersed. During the observisions you often hear "hush" and "ihhh" from the riding participants. It is obvious that it is mainly activities that contain some degree of action that provide the greatest degree of immersion. In an interview Helen describes this directly in her interview:

> Helen: Well, it's obvious to do things with a horse and a bike. They are action. It is quite super uh. I like the horse especially because it's new for me to get on a horse. Uh, bike I am more used to, but it is a great feeling, because you ARE on the bike ... like when you bike down to the supermarket, and you also feel that you go somewhere ... and you turn and all.

Figure 14.4: Screenshot of a horseback riding in Second Life: Wonderful Denmark, 2010.

In rehabilitation, such parameters as embodiment and a sense of presence have demonstrated positive effects for learning tasks (Konnerup, 2015; Phillips, Ries, Kaeding & Interrante, 2010)

According to specific training practices, naming, categorization, selection, orientation, and spatial disabilities SL is well suited to PWAs with a type of aphasia called anomic (involving problems with prepositions). Furthermore, persons suffering from Wernicke's aphasia[16] have immersed themselves, been associating, and been using a lot of (correct) words to describe

[16] PWA with serious comprehension difficulties. They often say many words or series of words that don't make sense with realizing it.

their actions and experiences. By contrast, SL might be difficult for PWAs with audial processing problems, at least when the quality of the sound is poor.

Figure 14.5: Screenshot of Michael´s avatar and the Tram in Second Life: Wonderful Denmark, 2010.

Michael suffers from Wernicke aphasia. He tells about and incident with a tram. Standing on the rails he gets surprised by the tram, and his fright of being hit makes him speak spontaneously:

> Michael: It was like before, in the evening, suddenly, traces ... sport sprint ... strain, train, it is...
> Speech therapist: The tram?
> Michael: Yes, a trolley ... tram on the rails. Yes, the tram, on the rails. Then, I say to my wife: Watch out... I better hurry across the road before I get hit, before the tram gets here. Suddenly it is close... I think it is awesome... hahahaha, that it suddenly...

The PWAs also enjoyed being in the company of others and travelling to places they had been to. The recognisability environment and landmarks stimulated the memory and their language. Some PWAs had a more peripheral participation role. This could be due to their personalities, the aphasia, or their lack of written and verbal skills. Nevertheless, in the SL, participants are visible through the presence of avatars. Through shared experiences and a shared repertoire with other participants, the creation of a common culture, narratives, chats, and any other kinds of interactions that contribute to strengthen their perceptions of their own identities give visibility to the other participants. Thus, the participants have a relationship with the space. It is familiar, and several express joys in meeting the known buildings and persons.

14.4 ICT Mediated Rehabilitation – Changed Practices

An overall objective of both cases was to investigate whether the ICT, especially web-based communities provide opportunities for qualifying rehabilitation both in terms of language, social relations and in relation to recreate itself and its identity after a brain injury.
Digital tools and their role in pedagogy an education is constantly changing. Through the 1990s and the 2000s, most technologies in rehabilitation were tools for improving speech and language production through transmitting, sending, receiving, and reading. Technologies with communicative, participatory, and opinion-making dimensions as in the two cases have great potential, but are still in their infancy (Code & Petheram, 2011; Dirckinck-Holmfeld et al., 2004; Konnerup, 2015; Konnerup & Schmidt, 2006; Petheram, 2004).

Implementation of new technologies gives rise to reflection on the existing practice. In relation to the two cases both the conceptual understanding of suffering from aphasia and to the pedagogy for working together with PWAs. Practice and the role of the speech therapy has shifted from having a primary goal of optimizing the language production and the communicative competence to also including language as access to learning, identity, participation and interaction. ICT and web-based methods have the potential to fulfil the UN´s conventions and EU´s digital strategies for persons with disabilities. Mediated by the digital tools PWAs are given possible tools to re-learn, compensate, or substitute for their lost communication abilities.

Thus, the role of the speech therapist role is changing to be scaffolders, mentors and facilitators. The content and teaching materials in BaseCube environments are, as mentioned, orchestrated by the speech therapist, but personally designed and relevant to each PWA. The digital learning environments offer several perceptual forms and multimodal communication; written, visual and auditory approaches. Often a combination of various modes that support each are used. For example, a PWA, with difficulties in maintaining the auditory soundtrack in the memory can solve a problem if the same content can be read in print and heard as audio; reading competence supports the auditory understanding. The interactive possibilities of social media facilitate web based spoken and written dialogue and collaboration and thus, a suitable framework for learning environment when learning is considered as situated learning in a community of practice.

14.5 Conclusion

From the above studies, it can be concluded that ICT and web-based community rehabilitation has a potential for PWAs. Rehabilitation is changing from re-building the injured brain to concerning the whole person and the communicative potential, each person contains. The opportunity to train and learn at home has given PWA the opportunity to show their strengths and competencies. The virtual and digital learning methods offer some opportunities to put the cognitive rehabilitation into a socio-cultural perspective and let the motivation become driving force for the linguistic rehabilitation. The virtual environment is independent of time and place, allows for active participation in the PWAs´ premises in terms of energy pattern, communicative strategy, time and fields of interest. Formal and informal learning processes are integrated and merged into each other. Using either formalised virtual environment or social media the PWAs have the time and tools to communicated, presenting themselves on an equal footing as other persons, and thus renegotiate their identity.

When the medium is changing, it is likely that the cognitive strategies change. Digital technologies, thus, have a potential to poke and prompt the language and thus develop a new and different form of communication and give a kind of alternative voices to people with communications disabilities empower learners with special challenges.

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