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# Introduction of Cognitive Support Technologies (CST) for Job Seekers

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## Abstract

Research shows that adults with cognitive impairment can benefit from cognitive support technologies (CST), and combined with good coping strategies, these technologies can help facilitate inclusion in the labour market. Experience from our rehabilitation work in Norway shows that introducing CST to persons with Asperger's syndrome and/or attention-deficit hyperactivity disorder (ADHD) can be challenging. This study describes and discusses factors that can promote or inhibit the introduction of CST in vocational rehabilitation services. These descriptions are based on twelve months of ethnographic fieldwork in two vocational rehabilitation programmes in Norway. We describe how adequate time, mandatory integration of technology in activities, recognition of and faith in the individual's ability to eventually find a job as part of a professional strategy, and the use of the job seekers' own technologies, are intertwined and interdependent factors that promote the introduction of CST. The inhibiting factors we describe may be related to the diagnosis of the typical challenges faced by adults suffering from ADHD and/or Asperger's, such as organizational challenges, procrastination or general difficulty in doing things in a new way.

## Keywords

Vocational rehabilitation services, cognitive support technologies (CST), resistance, procrastination, practice studies and recognition.

## Introduction

Job seekers with cognitive challenges, such as Asperger's, ADHD or mental disorders, are under-represented in employment (Steindal; Bø; Shattuck et al.). These job seekers are often skilful in the performance of the actual work, but have problems organising themselves in a job situation and coping with the social demands that they encounter on the job (Hawkins; Nadeau).

In some vocational rehabilitation programmes in Norway, technology is being introduced (Cognitive Support Technologies, CST) to improve this group's ability to cope with demands at work regarding organisation and communication, and to help give the job seekers a better organised and more predictable job situation. One challenge that was experienced in practice was that it could be problematic to persuade job seekers with Asperger's and/or ADHD to make use of technology to help them cope with on-the-job challenges.

This study describes and discusses factors that promote and inhibit the introduction and implementation of technology in vocational rehabilitation services. It is based on an ethnographic multiple-case field study, which follows two public-sector vocational rehabilitation programmes for twelve months, with a focus on describing the introduction of CST as cognitive support. The participants in the rehabilitation programmes are job seekers, primarily young men, with formal IT competence or an interest in IT, who have Asperger's or ADHD and additional difficulties, and who want to find work in the IT industry. Experience has shown that these participants are in a category of people who experience cognitive challenges, such as procrastination and executive difficulties (Barkley, Murphy and Fischer). In this paper CST refers both to the IT tools for production and communication that are used professionally in the companies and to the IT solutions that the individual job seeker uses in order to maintain or improve his/her competitiveness, or that help participants to be or to become more motivated to

try to cope with an activity or life situation (De Jonge, Scherer and Rodger). Examples of CST in this study are smartphones, and social skills, organisation and communication apps. In this context, the introduction and facilitation of CST is based on a combination of empirical knowledge and professional discretion (Bodine).

The usefulness of CST for employees and students with cognitive disabilities is described in numerous case studies and effect studies (Hill et al.; Gentry, Kriner, et al.). In general, the research suggests that the use of technologies can potentially improve the opportunities for people with cognitive challenges to cope with everyday life, increase their independence and improve their chances of finding a job (Chen et al.; Westbrook et al.; Erickson; Gentry, Lau, et al.). The literature also describes and discusses the phenomenon whereby persons with cognitive challenges have a certain amount of resistance to utilising technology to cope with challenges involving memory or personal organisation (Baldwin and Powell). It is suggested that this resistance may be explained by the failure of the proposed or available technology to correspond with the person's identity, or because it makes them feel uncomfortable, or because the technology reminds them so much of their impairment that they avoid making use of it (Baldwin, Powell and Lorenc). Other studies have shown that persons who use technologies that are referred to as consumer technology associate this use to a lesser extent with their being impaired (Parette and Scherer). One possible explanation for this reluctance, especially among persons with autism spectrum disorders, is that they are not fully aware that they lack the skills that are needed in order to obtain employment or to hold a job (Hansen).

## **Method**

This study is an ethnographic multiple-case field study that followed two public-sector rehabilitation programmes for twelve months. The selection of these two rehabilitation

programmes was a strategic one. The selection criteria were that the programmes should be conducted by rehabilitation companies that specialised in, and had expertise in the use of CST in their vocational rehabilitation work, that had recruited employees with interdisciplinary expertise – i.e. pedagogical, supervisory, social work and IT expertise – and that for the most part provided a service to adults with cognitive impairment who wanted to enter the IT industry.

Both rehabilitation programs took place at IT companies developing software and web solutions for commercial and public sectors. Participants and staff worked together IT projects. The work consisted in designing and program the web pages, write program code, write documentation and testing programs

The fieldwork resulted in observation notes, summaries of spontaneous interviews in connection with the observed situations (interactive observation) (Tjora) and transcripts from interviews with 13 participants, two groups of interviews with the employees, interviews with the two managers, and interviews with the two supervisors who were especially responsible for the introduction and training of the participants in the use of individual support and assistive technologies (CST). The semi-structured interviews were based on the observation notes that were submitted to the interview subject.

The admission requirement for the rehabilitation programme that was followed was that the job seeker had impaired working capacity and was assessed as having especially uncertain vocational prospects and a need for broad and close follow-up for up to two years (NAV). For example, between 50 and 100% of the total of 25 participants had a diagnosis of Asperger's. The fieldwork was cleared with the management six months before the first observation period, and management obtained consent from all employees and participants to take part in the study.

Researchers participated in all arenas and activities. No personal data was gathered. The study was approved by the Norwegian Centre for Research Data (NSD).

The identification of significant factors in the introduction of CST is based on a grounded theory approach with a systematic and inductive method for gathering, categorising and analysing data from the fieldwork (Glaser). A systematic iterative research process served as a response validation and as a process for dealing with the research ethical challenge in this project by helping to promote transparency and participation (Fangen).

## **Discussion**

The factors we found that inhibited the introduction of CTS were associated with general challenges confronted by adults suffering from ADHD and/or Asperger's, such as procrastination, organisational challenges or general difficulty in doing things in a new way. One of the observed challenges that the supervisors encountered in the introduction of technology was that the participants were reluctant or resistant to making use of technology that could potentially be used as CST. One of the supervisors said, *"There are so incredibly many people with Asperger's who have what I call 'grandfather's telephones', i.e. they don't like to talk on the phone and don't like to send text messages, so why do they need a smartphone? True enough! So we have spent a great deal of time trying to get them to use smartphones and to get them to realise that there are functions on this kind of phone that they may want to use."* Observations from the fieldwork and conversations with participants confirm that many had older touch-tone or flip phones. The following episode illustrates how severe this resistance could be:

*"We gave one of the participants a new smartphone, which was supposed to constitute part of the infrastructure in the future job in which he was supposed to start. It took fully three weeks to persuade him before he so much as touched the phone. During those three weeks, it lay unused*

*on his desk. He would not use it, but he graciously let it lie there. Among other things, he refused to use an app that we recommend for better coping with the social aspects of various social settings.*” (By the conclusion of the rehabilitation period at the company, the supervisor described the situation as follows: *“Now he uses this phone for “everything”.*)

All the participants in both of the vocational rehabilitation programmes owned a mobile phone and used it daily, but the supervisors perceived a reluctance on the part of many of them to talk on the phone. Interaction with the phone seemed to be social challenging, for example very few of the participants used the phone to be active on social media. When the participants started on their two-year vocational rehabilitation programme, only a few had a digital calendar or any other form of self-organising aid. Therefore, the main impression was that most participants did not see the benefits of using mobile phones for social interaction or self-organising.

The factors we found that promote the introduction of CST are intertwined and interdependent. During the fieldwork it was observed that the supervisors used several strategies and arrangements to introduce and arouse interest in the functionality of CST: arranging small-group workshops where participants assessed and wrote critiques of apps, insisting on including technology in the daily interactions at the companies, holding courses in setting up user accounts and organising apps, offering long-term loans or financial support for the purchase of a smartphone, and making training in the use of a social skills app mandatory. In the interactions with the participants, the supervisors ascertain what their interests are, what arouses their curiosity and what they find challenging. Through a number of observations and conversations with the participants, an impression was formed that this was a group of people who did not like to do anything “pretend” or as a drill. Therefore, it is a challenge for the supervisors to find

situations that inspire or motivate the participants to make use of technology, and for them to adapt it to the needs of the participants.

It was observed that both of the companies insisted that the technology should be a part of the daily interactions. At Company 2, the participants were required to send important messages to the management, for example in the event of illness, through an instant messaging (IM) solution. The participants were allowed to choose which IM solution they wanted to use. The following IM solutions were used: Text messaging, Messenger, Facebook, Google Chat, and Email. The supervisors responded via the same IM solution with a confirmation that the information had been read and understood, often in an empathetic tone and with practical messages. In the course of the rehabilitation programme, the supervisors also began to use this established IM communication channel to send important messages to the participants. They informed them about changes in upcoming job tasks and the specific consequences of these changes for the participants. The supervisors explained that the participants would benefit from this practice because they now had specific messages stored on their own mobile phones and in each participant's preferred IM solution. For their part, the participants said that they dealt with these specific messages and found it useful that the information could be called up again when they had a need for it. The fact that the digital interactions between the company and the participants took place on apps and platforms that the participants made use of before they began the rehabilitation programme was described by the supervisors as reassuring. The strategy of making use of an interaction channel that each participant was familiar with and had a knowledge of before the rehabilitation programme was a factor that helped ensure that the technology would also be put to use in work-related contexts. The supervisors stated that they

were more flexible in their choice of an interactive solution and that had no problems with making use of all available IM solutions.

At company 2, the supervisor insisted that all work schedules, memos, to-do lists and all other information that the participants needed should be entered into the participants own mobile phones. The supervisor sat down with the participant and said, *“You MUST enter this in your phone. You must enter this information in the phone because you MUST have the phone as your multi-tool for solutions.”*

The supervisors explained that by insisting that the mobile phones be included in the participants’ everyday life in this way, they ensured that the participants had a better overview, more predictability and more structure in their working day, but also that they had established the mobile phone as a channel for communication. Insisting that they make use of technology in this way does not preclude the same procrastination and executive difficulties with which the participants otherwise struggle in their daily lives. This was a slow process, which took place throughout the twelve-month period of the fieldwork. Having time to undergo this process was a crucial factor here, which promoted the introduction of technology. The success of mandatory integration of CST in activities, and the insistence on using mobile phones was contingent on the relationship between the job seeker and the supervisor. In the interviews, the participants stated that their confidence that the supervisors wished them well and regularly expressed faith that they could do an excellent job when they entered employment made them more willing to try out the technology that the supervisor insisted they should use. The participants also stated that they felt that they were given recognition for their IT expertise and could share their fascination with technology with the supervisors. Recognition (Honneth and Holm-Hansen) thereby became a factor that increased the employees’ reliability in matters concerning the use of technology and

encouraged the development of a trusting relationship between the participants and the supervisors, which in turn promoted the introduction of technology that could be useful to the participant.

In the situations involving “face-to-face communication”, where the participant and supervisor sit facing each other and enter information in the mobile phone, the technology also has another function. The supervisors stated that they use an iPad, a screen or a mobile phone in these situations in order to reduce the stress that many people with Asperger’s feel with eye contact or with not knowing where to look in these situations involving face-to-face communication. The use of a screen determines where the participant should look. The supervisor found that this helped to increase their perseverance and reduce stress in these interactive situations. This is also a practical interaction technique that introduces technology without encountering major resistance.

## **Conclusion**

In this study we have observed and documented that some job seekers with cognitive impairment are reluctant to make use of CST. Job seekers have behaved elusively and tried to postpone their use of assistive technology. These inhibiting factors may be related to the diagnosis of the typical challenges confronted by adults suffering from ADHD and/or Asperger’s, e.g. organisational challenges, procrastination or general difficulty in doing things in a new way. The intertwined and interdependent factors we describe that promote the process of adopting CST are: adequate time, mandatory integration of technology in activities, recognition and faith in the individual’s ability to eventually find a job as part of a professional strategy, and the use of the job seekers’ own technologies. Since the introduction of CST for this group is a process that takes time, it is advantageous for the rehabilitation professionals to have patience,

supervisory competence and insight into the nature of the problems that adults with cognitive impairment struggle with every day. This was a multi-site case study of a particular vocational rehabilitation professional practice based on strategic selection. It was not possible to draw any generalised conclusions from this exploratory study, but the identification and description of the challenges, and the identification of promoting factors, can be useful in dealing with other rehabilitation practices involving assistive technology, and in future research.

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