

VOCATIONAL EDUCATION – NEW GENERATION TEACHING MATERIAL FOR PEOPLE WITH ASD

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Abstract

New generation multimedia teaching material for people's with autism vocational education was built under the international cooperation with the theoretical assumptions of personalistic and the person-oriented approach. The didactic material combined of two main parts: general vocational skills training and particular skills adequate in four work places training (library, hotel, kitchen, office), was evaluated during the microgenetic training sessions with ASD adult clients. The results of meta-analysis are presented.

Keywords: *autism spectrum disorders, meta-analysis, vocational training.*

Independence and employment of people with ASD – the objective of vocational education

Autism Spectrum Disorder (APA, 2013) is a developmental disease of biological background and aetiology. This disease changes developmental path core processes of maturation as well as perceptual and social learning. But even in spite of being burdened with ASD, the people with ASD face some typical developmental tasks (Havighurst, 1981) that are related to emergence of the maturing personality and the individual's values and unique aspirations.

People with ASD face similar developmental tasks in their lifespan as their non-disabled peers; however, the transition process might be modified by specific factors related to the disease aetiology, health conditions and outcomes. One of the developmental tasks mentioned by Havighurst indicates a tendency to achieve emotional independence from the significant others - parents and other adults. Although the adolescents with autism may not reach this developmental stage in the same time as their peers do, they would also face in their life some kind of a developmental process of personal identity. Throughout this process care is transferred from the family to the outside world. It is a moment when it is important to notice the traits of this transfer and support the youngster in dealing with different feelings associated with the attempts of reaching independence.

Independence and maximal future self-reliance are one of main educational and therapeutic aims, which might be obtained if we create an environment, in which people with ASD can learn everyday life skills, as well as vocational ones, what will allow them to be unassisted and self-reliant in the future (Sánchez, Vázquez, & Serrano, 2011). Although the impairments associated with ASD usually last throughout the lifespan, some adults with ASD might obtain independent and autonomous living if provided with considerable life-long

lasting support such as vocational rehabilitation aimed at obtaining and keeping appropriate employment position. However, in reference to the research data, it can be assumed that only 15% ASD population gain real independence, whereas another 20% is able to function well in the presence of community-based support (Howlin, Goode, Hutton, & Rutter, 2004). Personal independence is based on economical independence and on the basis of human right statements each person has a right to work. In relation to the 10th right given in the Charter of Rights of People with Autism “people with autism have also the right to meaningful employment and vocational training without discrimination or stereotype; training and employment should have regard to the ability and choice of the individual” (Matthews & Matthews, 2013, p. 66-67). This legal regulation should be taken as the fundament of the holistic and coherent aim of the educational and therapeutic treatment in the perspective of adulthood and its developmental tasks.

American experience has demonstrated that the individuals with autism can work in a variety of community-based businesses and industries. However, successful, competitive employment is related to age, years of education, and absence of a secondary disability, but still in comparison with the severely disabled people and those with intellectual disability, the people with ASD managed to get a supported employment at higher percentage (44,8% in comparison with 31.9%) (Schaller & Yang, 2005).

In regard to the USA statistic data gathered in the period 2006-2010 about 58% of the autistic young people received services and the Vocational Rehabilitation; however, this result is slightly lower compared to the youth with intellectual disabilities (64%) (Migliore, Butterworth, & Zalewska, 2012). In contrast, from the data collected in Poland in 2010 it results that only people with Asperger syndrome reach the education at the level of secondary or post-secondary school. There are still a small percentage of people with ASD, who in the course of education have gained any vocational training (Dorociak, et al. 2010).

Employment of people with ASD – the triadic advantage template

Employment as purposeful activity for self-development, social contribution and livelihood is followed by a sense of contribution to one’s daily needs, an outlet for socialisation and a sense of accomplishment and competence leading to improved self-concept. The importance of being employed for people with ASD might be discussed at three levels: individual, family, social (Fig. 1).

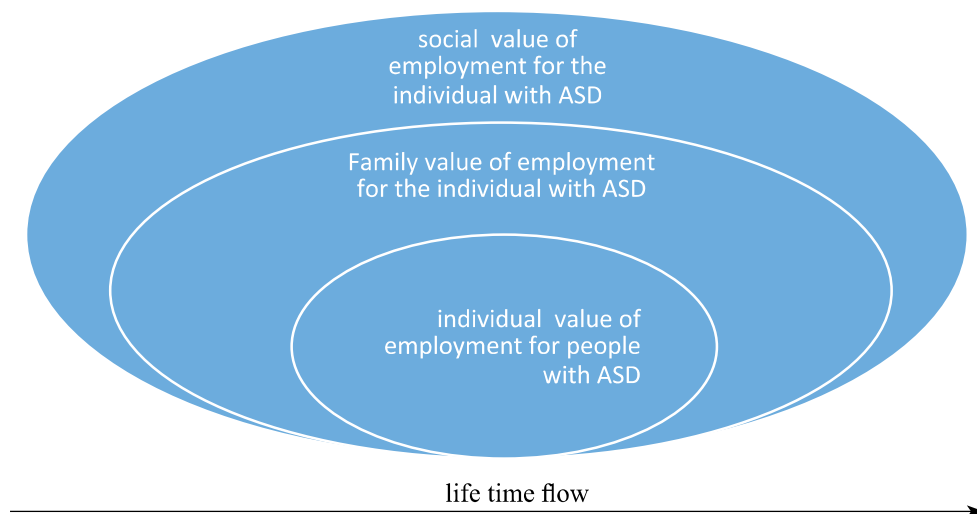


Figure 1. Temporal-contextual model of employment valuation

1. *Individual-personal value of employment for people with ASD:*

Employment is the natural extension of school-based programs and result of lifelong learning process, which is very important in the case of ASD people because of their weak ability of generalized learning. In the case of ASD people, the process of learning should be extended as much as possible to increase their knowledge and skills performance. Employment improves cognitive performance and emotional empowerment (Garcia-Villamizar & Hughes 2007) and it is a source of pride and sense for people with autism, while lack of employment often leads to psychiatric problems such as anxiety or depression. Social and vocational skills program specifically designed to address the needs of adolescents and young adults with ASD may reduce this feeling of anxiety and depression (Hillier, Fish, & Siegel, 2011).

Employment promotes personal dignity as well as improves life quality of individuals with ASD (Garcia-Villamizar, Ross, & Wehman, 2000; Garcia-Villamizar, Wehman, & Navarro, 2002; Persson, 2000; Mawhood & Howlin, 1999). Employment also enables individuals to make friends and participate in the community. It also gives meaning to their lives.

Work has an economic value due to the fact that employment enables the adults to earn their keep and pursue their interests. Employment enables the independent living without financial support from the generational family members. But only 40.8 percent of ASD people who participated in vocational rehabilitation in the US got employed (Cimera & Cowan, 2009) and nearly 60 percent of adults with autism did not get employed due to the low VR effectiveness. The people with ASD worked far fewer hours and for less pay than the most of other users of VR (Cimera & Cowan, (2009). This evidence shows, on the one hand, that the income of ASD persons is lower than average, so individual living needs might be not fulfilled at the appropriate level and, on the other hand, ASD people might have too much of non-structured spare time.

2. *Family value of employment for the individual with ASD*

The nearly 6 out of 10 adults with autism who do not get employed after receiving VR services must rely on friends, family, or governmental subsidies in order to live. Furthermore, they are unable to benefit from the social aspects of being employed. Nearly 60 percent of the adults with autism do not get employed. This is more than disturbing because it seems that the effects of VR are poor and a lot of efforts were lost (Cimera & Cowan, 2009).

Maintaining an unemployed adult child is a great financial and emotional burden on the family, especially for aging parents, the inability to provide a child with the future is for them an important factor that burns out their strength (Sekulowicz, 2013).

3. *Social value of employment for the individual with ASD*

Employment of people with ASD provides a number of economic advantages. If there is work, there is less reliance on government funds and more contribution to taxes (Howlin, Alcock, & Burkin, 2005; Jarbrink & Knapp 2001). Jarbrink and the team (2007) conducted a study concerning the societal cost-impact of adults with high-functioning autism. It was found that lack of employment results in a loss of work-time and productivity, which supports society and helps to keep it developing. Moreover, employment has a significant cost impact on the economy due to resource utilization. The study showed that high costs related to people with ASD are connected with the lack of supported employment programs for people with ASD, what have negative resource consequences for the whole economy. The research showed that by employing individuals with ASD the cost of community support would decrease and in this way create less reliance on daily programs and activities, such as adult day care. Salaries would provide the means to pay bills decreasing automatically the need for living support. However, increased health care costs are common due to a need for medication and psychiatric help (Jarbrink et al. 2007).

Employers and companies get the potential benefits if they hire individuals with ASD (Howlin, et al 2005) The employers often value the trustworthiness, reliability, and low absenteeism of this group (Howlin, at el 1995) Once employed, people with ASD often demonstrate particular strengths, such as attention to detail and ability to focus intensively, what results in increased work output and may bring joy in performing jobs often rejected by others due to social isolation or the repetitive nature of the tasks.

Vocational needs of people with ASD – the objective for constructing education tools

Individuals with ASD have significantly different vocational needs than individuals with other developmental disabilities (Müller, Schuler, Burton, & Yates, 2003). Uneven cognitive and social abilities associated with ASD constitute a diverse set of vocational needs that are challenging to be approached in usual manner, create problems with employment stability, and result in isolated work opportunities. The additional needs increase the number of challenges associated with finding appropriate and successful employment for adults with ASD (Hillier et al. 2007; Mawhood & Howlin, 1999).

Nowadays when technologies and support services are available high-functioning people with ASD might be successfully assisted and they might work in competitive environment. VESTA¹ is a new proposal of vocational material set and concerns initial vocational training for autistic adults based on alternating learning or work-related training in enterprises. It is due to the fact that one of the primary goals of vocational programming is to assist learners with performing their job-related tasks as independently as possible so that they can become competitively employed and keep their jobs while limiting their reliance on other personnel (Lancioni & O'Reilly, 2001).

VESTA – practical method of vocational training for autistic people

The program was developed on the basis of two fundamental premises for the construction of learning content and the organizational structure and methodology of teaching. Teaching content has been adapted to the specifics of both social and cognitive functioning of people with autism, as well as to their specific interests. Implementation of professional tasks, regardless of place of work requires some general social skills, which should be worked on. Social impairment of ASD people involves an array of deficit skills intrinsic to successful social interactions, which are core for appropriate job performance even at low-social posts. Those skills may include inappropriate hygiene and grooming skills, difficulty in following social rules, and acting inappropriately with individuals of the opposite sex.

The vocational training program available on CD in Polish, Greek, Czech and English, is divided into two main parts, including more detailed modules:

- General vocational skills as self-care and self-preparation for work
- Specific vocational skills related to work in particular workplace (in an office, a kitchen, a hotel, a library).

Each teaching modules comprise exercises on:

- Basic knowledge, which is essential for technical specifications of a job activities performed in particular workplace,
- Practical skills and competences related to dealing with professional duties in particular workplace,
- The example of behaviour regarding social or organisational difficult situations.

¹ VESTA multimedia vocational training program was prepared under the international cooperation with-in the project Vocational Education with Embedded Social Inclusion Tactics for Autistic people, training http://www.europeansharedtreasure.eu/detail.php?id_project_base=2012-1-PL1-LEO04-28080

At the end of each module there is a test procedure consisting of:

- Closed questions; the program user has to click YES or NO. Right answer leads to the next task; Wrong answer leads to the screen with appropriate knowledge.
- Closed questions; the user has to tick on one of four alternatives. Right answer leads to the next task; Wrong answer leads to the screen with appropriate knowledge.
- Closed questions; the user has to drag and drop the window with written part of sequence.
- Closed questions; the user has to set in the right order the sequence of activities described step by step. Right answer leads to the next task; Wrong answer leads to the screen with correct sequence order.

The theoretical background for constructing the material was based firstly on social learning theory (Bandura, 1977) and secondly on structural teaching approach (Schopler et al. 1995). According to Bandura (1977), visualisation as well as motivation was the key elements due to the fact that learning takes place by observing others. Nonetheless, learning is not possible via observation if the learners do not care about the skill being taught. So the learners should be asked to choose an area of training according to their personal interests, and thus improving their motivation to attend. Repetition of the training is the way to improve retention processes or memory in an individual who remembers, what (s)he has observed. Reinforcement and motivational processes are important during this procedure because the individual is more likely to copy some behaviour after observing it, especially on the basis of the consequences that follow such behaviour. The individual receives a reward (well done mark) after performing a task correctly. But, when he fails, the program goes back to the appropriate information.

Structural teaching approach was the basis of the instructional strategy that was used there. It emphasizes visual support for learning process. The material and teaching procedure were also organised in reference to the major components of structured teaching such as physical structure, schedules, work systems, and task organization. All activities are presented as the step-by-step sequence to be taught and repeated in a correct way.

Preliminary findings of the vocational program effectiveness evaluation

The effectiveness evaluation of the vocational training material VESTA was investigated during the experimental procedure based on micro genetic approach. Micro genetic study is a special type of longitudinal research in which samples of behaviour are collected very often – two or three times a week – in order to get a detailed picture of the developmental changes (Siegler, 1995). The teaching/learning procedure consisted of ten training sessions twice a week - each of them to analyse the learning process as well as final learning effect. The last (eleventh) session was organized with one-month delay to check long-lasting effect stability.

The preliminary results show that the teaching material and procedure gave a positive and significant effect in all four tested areas (Table 1).

Table 1. Vocational training effectiveness after ten trials

Particular work position	First trial	Final trial	Z ratio	p
Hotel staff assistant	46	68	$z=-1.69$	$p<0.05$
Office staff assistant	75	100	$z=-1.864$	$p<0.03$
Cook assistant	48	88	$z=-3.218$	$p<0.0006$
Librarian assistant	45	95	$z=-3.450$	$p<0.0003$

The source: own study based on the data published by Kossewska (2014)

The significance of the difference between two independent proportions in two independent samples related to the beginning trial and final trial was calculated. The differences between the results obtained by the trainees during the first and last meeting show that there was a significant increase in knowledge and ability to perform the tasks typical for the auxiliary worker at four workplaces. However, the nature of the various learning curves analyzed from the perspective of micro genetic changes over time show a non-linear increase in proficiency, which may suggest the existence of latent learning process, the effects of which were disclosed the most often during the fifth meeting.

In order to determine permanence of the learning effect, analysis was also performed on a delayed effect of training. One month after the last meeting of the training, participants re-took the test tasks. The results received after one-month break and referring to the implementation of tasks typical for an auxiliary worker in four analyzed workplaces (hotel, kitchen, library) are not statistically different from the results obtained during the last session, and in the part related to the activities carried out in the office remain at the maximum level (Table 2).

Table 2. Long-lasting stability of vocational training effectiveness after one month

Particular work position	First trial	Final trial	Z ratio	p
Hotel staff assistant	68	54	$z=1.041$	n.s.
Office staff assistant	100	100	Error	n.s.
Cook assistant	88	82	$z=1.5$	n.s.
Librarian assistant	95	90	$z=0.6$	n.s.

The source: own study based on the data published by Kossewska (2014)

The presented results indicate that VESTA training materials can be considered effective in the training of professional competence in individuals with ASD and deferred learning outcomes remain strong and stable after a month postponement. The results showed that VESTA, which used visual aid such as photos to support learners on remembering information as well as work activities, when applied for ASD people as their vocational training, was effective. This result corresponds with the other researchers' findings on the effectiveness of using visual supports such as pictures to support learners (Copeland & Hughes, 1990; Martin, Mithaug, & Frazier, 1992; Wacker & Berg, 1983). However, using video based supports to promote independence in employment settings might be a more effective strategy (Laarhoven, Winiarski, Blood, & Chan, 2012).

The VESTA proposal might be applied as the preliminary training procedure used within, as well as out of, many supporting and educational institutions both in formal and informal teaching. However, this preliminary training should be followed by more intensive and holistic approach recommended by Hendricks (2010), who indicates that training programs should focus on four areas to make successful employment obtainable for people with ASD. These four areas are related to job placement, social and physical environment, where ASD person works and practical skills related to job position. The following areas were pointed out by Hendricks: (a) Job placement – finding a job a person is comfortable with in reference to his/her interest and skills; (b) Supervisors and co-workers – finding people who are willing to work with individuals with ASD (knowing what the disability is and how it affects people); (c) On-the-job-provisions – training on the job, where people are in the environment where they will work to improve practical skills; (d) Work place modifications – arranging the workspace.

Conclusions

1. VESTA proposal is an effective teaching material both for formal and informal education under assistant supervision or without it. It is due to the fact that this program is intuitively organised and automatically leads the learners to the appropriate parts and tasks in reference to the previously given answer.

2. And yet some modification might be useful to make the program more suitable for ASD person training. Some of the training contents have not been fully mastered (especially in practical way), suggesting the need to reduce the steps in the action sequences.

3. Training of some professional skills required to overcome the inhibitory effect of pro-active interference, especially if the operation is known from everyday experience (e.g. making the bed, washing dishes), but in a professional situation (hotel, kitchen) requires precise execution and implementation of the different scheme.

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Summary

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Employment is the natural extension of school-based programs and result of lifelong learning process, which is very important in the case of ASD people because of their weak ability of generalized learning. In the case of ASD people, the process of learning should be extended as much as possible to increase their knowledge and skills performance.

Article presents research on new generation multimedia teaching material for people with autism vocational education was built under the international cooperation with the theoretical assumptions of personality and the person-oriented approach. The results of meta-analysis are presented.

The presented results indicate that VESTA (Vocational Education with Embedded Social Inclusion Tactics for Autistic people) training materials can be considered effective in the training of professional competence in individuals with ASD and deferred learning outcomes remain strong and stable after a month postponement. The results showed that VESTA, which used visual aid such as photos to support learners on remembering information as well as work activities, when applied for ASD people as their vocational training, was effective. The program was developed on the basis of two fundamental premises for the construction of learning content and the organizational structure and methodology of teaching. Teaching content has been adapted to the specifics of both social and cognitive functioning of people with autism, as well as to their specific interests. The didactic material combined of two main parts: general vocational skills training and particular skills adequate in four work places training (library, hotel, kitchen, office), was evaluated during the microgenetic training sessions with ASD adults. Implementation of professional tasks, regardless of place of work requires some general social skills, which should be worked on.

It was set up that VESTA proposal is an effective teaching material both for formal and informal education under assistant supervision or without it. It is due to the fact that this program is intuitively organised and automatically leads the learners to the appropriate parts and tasks in reference the previously given answer. Some modification might be useful to make the program more suitable for ASD person training, but training contents have not been fully mastered (especially in practical way), suggesting the need to reduce the steps in the action sequences.

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