The Role of Educational Rehabilitators in Kindergartens in Implementing and Applying Assistive Technology

Lucija Veršić Jović[1], Renata Pinjatela[2], Tomislav Ljutić[3]

[1]Kindergarten Latica, Zadar, Croatia

[2]University of Zagreb, Faculty of Education and Rehabilitation Sciences, Department of Motor Disorders, Chronic Diseases and Art Therapies, Zagreb, Croatia

[3]Kindergarten Potočnica, Zagreb, Croatia

HOW TO CITE:

Lucija Veršić Jović, Renata Pinjatela, Tomislav Ljutić (2026). The Role of Educational Rehabilitators in Kindergartens in Implementing and Applying Assistive Technology. International Journal of Special Education, 41(11s), 1261-1275

COPYRIGHT STATEMENT:

Copyright: © 2026 Authors. Open access publication underthe terms and conditions of the Creative CommonsAttribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/).

ABSTRACT:

In the last fifteen years, assistive technology (AT) has become an important tool in working with children with developmental disabilities in Croatia. The aim of this research was to investigate the significance of educational rehabilitators in kindergartens in the implementation and application of AT. The role of the educational rehabilitator is unique because their extensive direct work with children in the group and daily contact with parents provide a special type of consistency and insight into the child's daily functioning. At the same time, AT is increasingly becoming the focus of both scientific and practical efforts as an important mediator in the implementation of inclusion.

To gain a detailed insight into this topic, a qualitative methodology was chosen. The participants were nine preschool educational rehabilitators. The research results highlight the importance of a team approach and the education of professionals about AT. They also emphasised the key role of educational rehabilitators in kindergartens in the implementation of AT. The need for a structured method of assessment and evaluation, as well as support in the implementation and use of AT, was also emphasised.

Keywords: assistive technology, augmentative and alternative communication, educational rehabilitators, kindergarten

1. Introduction

With increased public awareness and the implementation of inclusive principles, children with disabilities now attend kindergartens, participate more in everyday activities, and face the challenges these bring. Assistive technology (AT) can significantly facilitate their daily functioning and help them cope with these challenges. Educational rehabilitators, as professionals working with children with disabilities, play an important role in this process. As experts employed in preschool institutions, they support the child and parents through various phases, including dealing with the diagnosis, entering the system, and transitions within the system. Research indicates that AT can help them perform their work more effectively, contribute to the child's progress, ease daily challenges, and provide a greater sense of success and satisfaction (Botelho, 2021).

The World Health Organization defines AT as the application of organised knowledge and skills related to assistive products, including systems and services, and considers it a subset of health technology. An assistive product is any external product (including devices, equipment,

instruments or software), specially manufactured or generally available, whose primary purpose is to maintain or improve an individual's functionality and independence, thereby promoting their well-being. These products are also used to prevent impairments and secondary health conditions (WHO & UNICEF, 2022).

One of the key initial steps in the implementation process is assessment. In addition to evaluating the user's abilities and needs, the assessment of AT needs should include goal setting, selecting the appropriate solution, purchasing, implementing and adjusting the technology, continuous monitoring of progress, and providing support for its use in daily activities. The assessment of AT needs is a repetitive process (Delzotto, 2022; Pinjatela and Vinceković, 2023). A common feature of all these approaches is the integration of technology into everyday contexts so that the user can use it after its introduction. Therefore, during assessment, several factors are considered, which can be divided into three main categories: device-related factors (efficiency, operability, and durability), environment-related factors (physical and social), and person-related factors (Perić, 2022).

For the assessment and subsequent implementation of the device to be successful, it is essential to ensure effective cooperation not only among experts, but also with the user and their family. Beigel (2000) states that assessment is not simply connecting a person to a device, but a process of joint learning and exploration between the user and the expert, in which they identify aggravating factors in the environment and develop solutions to eliminate or reduce these negative effects. This process includes identifying the user's needs and strengths (Beigel, 2000; Desideri et al., 2013; Federici et al., 2014), and aims to achieve the user's developmental and educational goals, provide assistance to professionals and families working with the user, and find solutions that enable the setting of new goals (Desideri et al., 2013). It is a comprehensive and complex process, for which each assessment model includes a recording and monitoring system, as well as steps to achieve an optimal result. For the professional to act effectively and propose an appropriate solution, they must not only know the person, their needs, strengths and interests, but also be very familiar with the technology.

Research indicates that AT for preschool children with disabilities plays a significant role in promoting communication, mobility, and independence (Lohmann et al., 2019). When considering the team responsible for making decisions about supporting children with disabilities in the field of AT, it is essential in Croatia to include an educational rehabilitator. Educational rehabilitators are a distinct group of professionals who, during their education, acquire extensive knowledge about children and people with disabilities, their strengths and needs, and the social context in which they live. Inclusive principles, prioritisation of the individual, and teamwork are integral components of their education. Upon completing their studies and entering practice, their work is regulated by the Act on Educational and Rehabilitation Activities (Official Gazette 18/2022), which defines the content, conditions, and manner of performing these activities. The occupational standard defines an educational rehabilitator as an expert who "(...) performs regulated educational and rehabilitation activities with the aim of improving functional abilities and developing individual potential, acquiring academic and social knowledge and skills, professional training/rehabilitation, improving the living environment and quality of life of the target population" (Croatian Qualification Framework, 2022). Particularly important in this context is the fact that the Standard, along with numerous other competencies, officially recognises the importance of the role of educational rehabilitators in the field of AT. Their competencies are listed for all stages of AT use, including assessing needs, selecting technology and support strategies, providing services and education related to its use, application, and evaluating its effectiveness. These competencies are especially valuable when considered alongside the other knowledge and skills educational rehabilitators possess, particularly their ability to work in teams, engage in interdisciplinary and,

when possible, transdisciplinary collaboration, all aimed at maximising the child's well-being. Such a team approach has proven to be an effective path towards high-quality implementation of AT (Boger et al., 2016; Da Fonte and Boesch, 2016; Desideri et al., 2013).

Research has shown that an individual expert's tendency to implement AT in their work largely depends on certain characteristics, such as knowledge, values, and experience (Tamakloe and Agbenyega, 2017). Additionally, parents' attitudes and inclination towards the implementation and use of devices depend significantly on their education and information, with the expert's role in providing support, education, and cooperation with parents throughout the process being crucial (Moorcroft et al., 2019). Teamwork is also an essential element for the effective application of AT.

Although there has been a noticeable increase in research on AT, especially augmentative and alternative communication (AAC), there is limited research addressing its application and implementation in the context of kindergarten groups. This research aimed to gain insight into the specifics of implementing and using AT in the preschool system. It also sought to provide a clearer understanding of the educational rehabilitator's role, both as an individual and as a team member, in the implementation and use of AT. Educational rehabilitators were selected who work in kindergarten groups, are in direct daily contact with children, could observe children in natural conditions and interact with peers, and are also in continuous contact with parents. It is assumed that by revealing the perspectives of these experts, valuable insight into the usefulness of AT, as well as the obstacles to its application in everyday work, can be obtained, leading to important implications for practice and a better understanding of the situation in practice.

The aim of this research was to gain a more detailed understanding of the specific role and importance of the educational rehabilitator in kindergartens in introducing and supporting the use of AT, both as an individual and as a member of the decision-making team in this field, as well as the challenges they face and the support they require in providing AT services.

Based on this aim, the following research questions were formulated:

1. What is the role of the educational rehabilitator in introducing and supporting the use of AT?
2. What is the role of the educational rehabilitator as a member of the team that decides on the selection and application of AT and communication tools for a child with a disability?
3. What challenges do educational rehabilitators face, and what support is needed in providing AT services?

2. Methodology

2.1. Study design

The paper used a qualitative methodology, specifically thematic analysis, to identify, analyse, and present key themes within the collected data. Data collected through, focus group and semi-structured interviews, were analysed using a coding process in which individual participant statements were grouped into meaningful units and then into broader thematic frameworks.

2.2. Ethical Approval and Consent Statement

The research strictly adhered to the ethical principles of scientific practise, the principles of protecting the dignity and other rights of all participants in accordance with the Code of ethics of the Committee for Ethics in Science and Higher Education (2006) and the Code of ethics of the University of Zagreb (2009). The participants agreed to take part in the study after an informative presentation by the researcher, which provided basic information and explained the purpose of the study. They were informed that their identities would remain completely anonymous. All participants signed a Consent to Participate in the Study, which was created for this research, and were informed that they could withdraw from the study at any time.

2.2. Participants

The participants were nine educational rehabilitators from two kindergartens in Croatia. They were selected using purposive sampling to obtain a homogeneous group in terms of education and experience with AT. To protect

their anonymity, the participants' gender, the names of the institutions, and the locations of the kindergartens are not provided. The participant codes and their years of service are shown in Table 1.

Table 1: Participants

Participants	Years of service
P1	30
P2	17
P3	35
P4	6
P5	3
P6	5
P7	30
P8	10
P9	18

Procedure

Six participants took part in the focus group. The focus group method offers a cost-effective and efficient way to gain in-depth insight into a topic, as information is gathered both from participants' statements and by observing group dynamics. Its interactive nature can lead to shared insights and conclusions, or the creation of new collective knowledge (Ochieng et al., 2017). In addition to the participants, the focus group included a moderator (one of the researchers) and an observer (an external, impartial person). Focus group was conducted in one of the kindergartens. Individual interviews were conducted with three participants.

Data Analysis

Thematic analysis was used for data analysis, specifically employing the realist approach, which focuses on participants' experiences, meanings, and perceptions of reality (Lisak, 2023). The data were analysed through a coding process in which the collected data were summarised to convey the most important statements from the participants. This material was then organised into research themes. Before analysis, the audio recordings were transcribed, and the resulting transcripts were colour-coded according to significant statements from the participants and organised by theme. The themes emerged from the research objective and research questions, with some particularly significant themes introduced by the participants themselves.

3. Results

Table 2 summarizes the themes, subthemes and codes that emerged in the research.

Table 2 : Themes, Subthemes and Codes

Themes	Subthemes	Codes
Experience and perception of AT among educational rehabilitators	Experiences in previous work with AT	Positive experiences with AT. Consistent use of the same set of aids Extensive experience in using AT. The type of difficulty affects the possibility of using AT.

		Atmosphere and group dynamics are important factors for introducing and using AT in a group The importance of collegiality and mutual support when introducing AT. The process of introducing AT is lengthy.
	Usefulness of AT when working with children with disabilities	AT helps in acquiring new skills and abilities. AT contributes to reducing undesirable behaviours and frustrations. Assisted communication is most useful for children with communication difficulties. AT helps in establishing contact with peers.
	Influence of professionals' personal characteristics	Personal and generational resistance to technology hinders the adoption of AT. Unwillingness to undertake additional work and accept change impedes the use of AT.
	Key devices used in work	Simple communicators Tablet communicators ICT-AAC applications Eye-gaze devices
	Availability of technology within the institution	Large selection of aids in the workplace Financial support from the institution's founder contributes to the high availability of AT Good cooperation with the supplier influences the high availability of AT
	Attitudes towards AT	Positive attitudes towards AT Perception of AT as helpful in work Personal and generational characteristics influence the development of attitudes towards AT.
	Professional growth and development	Differences in perception of one's own education. Continuous attendance at various educational programmes. Working on oneself influences changes in attitudes towards AT.
The role of the educational rehabilitator in the implementation and use of AT	The role of the educational rehabilitator in relation to parents	Open communication with parents. Informing and educating parents Involving parents in work.
	The role of the educational rehabilitator in motivating the use of AT	Using games to motivate the child to use AT Using familiar with interesting items to introduce AT to the child.
	An active role in the introduction of AT	Work on acquiring the pre-skills required for using AT Gradual introduction of AT

		Consistent application of AT. Monitor the child's needs and interests Offer the child different devices Change solutions in accordance with the development of the child's needs and interests Separate the child for individual work in the initial stages of adopting AT Inform and educate the support worker about the AT being introduced
	Managing group dynamics	Choosing the appropriate device according to the needs and capabilities of the entire group Distributing attention among multiple children Achieving individual goals as part of daily group routines
	Advantages of the role of group leader	In a group, learning takes place in natural conditions and as part of routines. The group leader spends more time with the child and gets to know him or her better. The group leader has more opportunities to try out and introduce aids.
Assessment, monitoring and evaluation methods	Assessment factors	The child's current needs and abilities The child's desires and interests. Environmental conditions. The possibility of application in a group.
	Assessment methods	Assessment is carried out gradually. Most assessments are observational. Checklists are used for certain assistive communication systems. Some devices have integrated assessment systems.
	Methods for monitoring and evaluating progress	The child's progress is monitored in practice. A collaborative approach is used to monitor and evaluate the adoption of assisted communication. Checklists are used for appropriate AAC.
Team approach to implementing AT	Team members and forms of cooperation	Collaboration with a SLT throughout all phases of AT implementation, with emphasis on assisted communication. Collaboration with a psychologist regarding socio-emotional requirements as prerequisites for AT implementation.

		Collaboration with a physiotherapist concerning positioning and movement acquisition during AT use.
	Forms of team cooperation	Educational rehabilitator plays a key role in making proposals and decisions about AT. A transdisciplinary approach is used when introducing AT. Daily cooperation is essential in solving everyday challenges. Joint meetings are held for parents.
	Quality of cooperation within the team	Differences in quality of team cooperation in the institution. Overall, the quality of cooperation is considered positive.
	Forms of cooperation with parents	Informing and educating parents. Setting goals together. Using information received from parents. Working together on specific goals.
	Quality of cooperation with parents	The quality of cooperation with parents was generally assessed as poor.
	The child as an active participant	When possible, the child should actively participate in choosing AT.
Cooperation with other institutions and schools regarding AT	Forms of cooperation	Education of employees from other institutions. Mutual exchange of information. Joint transition planning. Joint participation in projects.
	Quality of cooperation with schools	Some schools are informed in advance and achieve quality cooperation, while most schools do not achieve good cooperation.
	Quality of cooperation with other institutions	High-quality cooperation with most preschool institutions.
Challenges and need for support	Technical and financial challenges	Easy breakage and high sensitivity of the device. Unsuitability of the device for use by some children. Frequent updates and system crashes. Excessive dispersion of responsibility for the devices.
	Lack of time	Too little time to devote to the effective implementation of AT.
	Implementation challenges related to expectations	High expectations from parents put pressure on the professional. High expectations from professionals lead to setting unrealistic goals. Setting unrealistic goals creates feelings of frustration and failure.

	Challenges related to the group workplace	Difficult to achieve individual goals in a group context. Difficulties in distributing attention. Difficulties in prioritising goals.
	Support needs	Need for permanent technical support or a work technician. Need for uniform and systematised assessment, monitoring, and evaluation instruments. Need for a specialised AT cabinet within the institution. Need for a specialised AT expert (coordinator) in the institution.

Experience and perception of AT among educational rehabilitators

All respondents emphasise positive experiences and attitudes towards AT, perceiving it as helpful: "*Well... in my opinion it is positive. Since we started using it, it has enabled me to work with different aids for different children. It helps in any case." (P3).* They state that they have many years of experience working with AT: *"So it must have been about 10 years since AT appeared on the Croatian market; it is used in our kindergarten in Croatia" (P2)*, and that it has made their work much easier. One respondent notes that she has been using mostly the same aids for years: *"So in fact, today I can say in relation to all the innovations that have occurred, to my encounters with different things, that I actually use the same things today as I did five years ago. I am always somehow at the base, with those aids from AT" (P1).*

The most mentioned technology is some form of AAC, such as various communicators and PECS: *"Big Mac, something that is the alpha and omega, and very often forgotten, but it is actually an excellent, excellent communicator" (P2); "I do not know, this Go Talk, everything, Quick Talker, iTalk2 is excellent too, somewhere to start" (P2).* AAC is particularly emphasised as useful and important: *"I think that assistive is the most important for children with communication difficulties" (P5); "With these children for whom this is the only form of expression, it is really wonderful for them" (P1).* Along with AAC, they highlight the usefulness of ICT-AAC applications in their work and low-tech AT: *"Low-tech tools proved to be the most useful in my work: pictures, communication boards, visual layouts, specific aids (pen holders, adapted cutlery)" (P7). "Communication boards, visual layouts, simple communicators" (P9).*

In general, participants emphasise the significant benefits of AT when working with children with disabilities in areas beyond communication*: "(…) it helps children understand verbal instructions more quickly and acquire new skills, concepts, content, and activities" (P1); "As a bridge that can make their everyday functioning easier" (P5); "It reduces tension in children" (P1); "We can also minimise undesirable forms of behaviour with its use" (P2); "More opportunities for interaction through play, especially for some children who will not do so on their own initiative" (P5); "The use of AT in working with children with disabilities is of great importance because it adapts the way they learn, facilitates communication with the environment, increases independence, reduces frustration and stress, and helps with easier inclusion in the social environment" (P7); "The use of AT is very useful in working with children with disabilities because it serves as a tool that allows children to develop properly, express emotions and needs, and perform various activities" (P8).*

However, they note that group dynamics and the types of difficulties faced by the children they work with greatly affect the success of the application: *"So our experience is actually quite related to the workplace (…), I constantly bring the focus back to the structure of the groups and the conditions in which these activities take place" (P1).* In addition to group dynamics, an important factor is the personal characteristics of the professionals and their readiness for professional growth and

development: *"(…) I think that the key lies largely in the personality of each of us who is, in some way, egotistical and lazy towards the obligation we should adopt. I am saying this from a personal perspective. I mean, this is really something that I think happens in every institution (…) I think that at least 30 percent of us are people like me. Do you understand? So, I got the opportunity to learn through training. I got support, I got everything, but I did not develop because it is really too much for me now. Because after 30 years, it is all too much for you" (P1).* This can be helped by collegiality and mutual support in practice: *"... and these young girls, whoever you ask, they will all help you and take a certain step" (P1).*

The respondents emphasise that they have a high availability of various devices at the workplace and consider themselves well educated in the field of AT: "*I think that through several training sessions I have gained enough knowledge to implement and supervise AT. However, cooperation with fellow professionals is necessary to harmonise the application of AT, as well as continuous education and the promotion of AT use in everyday work, due to its wide range of applications and not only for children with disabilities." (P9)*

The role of the educational rehabilitator in the implementation and use of AT

The role of the educational rehabilitator in the implementation and use of AT is emphasised as crucial: *"Well, I would say decisive. I think that when I propose something, the SLT agrees in principle, because mostly, they think that I know the child better within the group than those who separate them or come to observe them for half an hour. I think that we are the ones who ultimately make the decision" (P1). "When someone is a leader, then they really know the child best. They know the child in every situation, they know their capabilities. They know when and what will be useful" (P2).* The role towards parents is considered particularly important: *"Perhaps our role is more important towards parents because when we introduce any device, the parent knows why we are doing it and how we are doing it, and what is very important is to give the child a lot of time" (P2).* Constant and open communication and cooperation with parents is important: *"With parents, this process is also long, where you get feedback every day about how things are at home, what is going on at home, what they did, what they did not do, what they succeeded in, what are some negative aspects of using it (...)" (P1).* Sometimes it is necessary to acquire certain skills before using some of the aids: *"So first we have to stop and see, aha, with this child, the most important thing for him is actually to be independent, and then we will see what else we can introduce" (P4). "In order to even start thinking about introducing assistive technologies in working with a particular child in the group, it is necessary that the child has spent at least three months in the group so that a valid observation of their functioning can be carried out and that the adaptation has been successful" (P8).*

When introducing, it is important to be guided by the child's needs and interests: *"I usually start with pictures, photographs of parents and things close to the child" (P1). "Actually, the child figures it out, and then we apply it to something else…" (P4).* They emphasise the importance of motivating the child to use and learn through play: *"Well, since there are so many games, we always choose some interesting ones. What is great, for example, in the Look to Learn application, is that I often did it by changing photos. So, I would very often use photos of the family and photos of other children in the group. Here is just one specific example – shooting faces with pies or cannons, shooting from a cannon" (P2).* They state that the key is the active involvement of the child when possible: *"(…) but the most important thing is that the child has the opportunity to choose... " (P1).*

Regarding some specifics in managing group dynamics, they note: *"I think my assessment of the child can be excellent, but the assessment of the environment in which the child or group is, and of all the needs of those children, may not be as good…" (P1).*

Additionally, participants believe it is necessary to inform the support worker about AT: *"But we also cannot ignore the support worker who is in the room all the time. That support worker must know what we use it for, when we use it, and how it is used" (P2).*

They state that the conditions in which they work as group leaders allow a unique approach to teaching compared to individual work with a child: *"It is more complicated, but on the other hand, as an educator who spends five hours inside, I can certainly better assess when and at what point the child will be offered or certain things will be done on certain devices, right? While in individual work, all these aggravating*

circumstances are removed, right..." (P2). "Well, in a group, learning takes place in a more natural environment. We can also use the communicator for feeding routines and self-care, but individually you cannot do that in 45 minutes" (P5).

The participants emphasise that consistent application of AT is very important: *"For the application of AT to be of the highest quality and to achieve the best possible results, it is extremely important that the use of AT is daily, regular, and systematic" (P8).*

Assessment, monitoring and evaluation methods

When specifying evaluation methods, respondents state that they mostly rely on observation: *"Actually, observations. You see how well he is doing, what he is doing, whether you can offer more or if you will remain at that level. So, by pure observation" (P3).* They conduct the assessment gradually, continuously monitoring the child and their needs: *"... The child figures it out for us, and then we apply it to something else. So, if it was a toy car, now we are going... We follow his interest and it changes, it is in phases, now it is a toy car and now it is, I do not know, some ball, and then we go to the ball" (P4). "Well, let us say that is the most banal thing. Let us say when we have a communication book. You first introduce two pictures to him and then, after the child has mastered the use of those two pictures and when he has done it, I do not know, ten times without any stress, admonition or help, then you can introduce a third one. So, for a while he should be successful with praise, then you slowly calm down and introduce a new picture. More or less gradually." (P1)*

Regarding assessment instruments, participants state that there are specific checklists only for some systems and aids: *"Well, for those low-tech tools, we filled out percentages until they reached the last stage. But for me, for example, I do not know about the communicator, there is no assessment list, and I assess the child's progress through observation" (P5). "For PECS, we can only use checklists …" (P6).* Some applications have integrated systems for monitoring progress: *"Although certain applications exist and are currently being used gradually. The applications themselves offer, from simpler to more complex ones, a kind of feedback for us. So, when we see that the child has mastered the first step, we move on to the second. Someone starts immediately on the third because they do not need it. So, some applications are really well made for that part too." (P2)*

In evaluation and monitoring, they also mostly rely on observation or checklists: *"How do we monitor? Just with our notes, we do not have any instruments or tools." (P2) "Mostly, as an educational rehabilitator, I monitor and evaluate the effectiveness of AT using a checklist." (P8)*

Team approach in AT implementation

The key point turned out to be teamwork, provided that the child remains at the centre of everything and is included as much as possible: *"But what is the most important point, and I would like it to be highlighted in big, bold letters. We must offer the child more and monitor what he chooses. Of course, we are there to suggest, monitor, and observe. If it is a matter of motor difficulties, of course we will intervene; we know what would be appropriate, but the most important thing is that the child can choose (...)" (P2).* Collaboration within the team is daily and often transdisciplinary: *"These are not conversations where we close the door and then arrange a meeting. These are every day, somewhat sporadic conversations, solving situations as they arise and in that way." (P1)* The team consists of several experts and works closely with the parents and the child: *"I think the same: rehabilitator, child, SLT, physiotherapist. It also depends on the difficulties and on which AT we use, but we all make the decision together in cooperation with the parents, and above all, the child." (P2)*

The role of the group leader within the team is emphasised as crucial: *"When someone is a leader, they really know the child best. They know the child in every situation, they know their capabilities. They know when and what will be useful." (P1)* The most frequently mentioned collaboration is with SLT: *"We are never alone. I would say, in my sixteen years of experience, that everything we introduce to the child certainly involves the SLT…" (P2) "… the SLT also assesses what the child's articulation could most easily develop first." (P1)* The quality of cooperation with SLT varies depending on the respondent, with some reporting extremely positive experiences: *"Well, for me, at the beginning, I had very good cooperation with the SLT, and then, since it was more convenient for her to separate the child and teach them the beginnings of PECS, she did so, for example. I took over*

in the group, and we still function in such a way that she often stays in the group or, when she starts, she takes the child individually, but together we agree on what we think is best for the child, and we can propose this to the entire team, who may agree or disagree." (P5) However, there are also negative experiences: *"For example, I unfortunately do not have any cooperation with my SLT. So, everything the child needs in terms of assistance, I make pictures, I show the parents, and so on. Or if books are made, and so on, I do all that. I do not really cooperate with the SLT." (P3)*

Collaboration with other experts is also important. Working with a psychologist has proven particularly valuable in addressing challenges related to adaptation and separation: *"Slowly, slowly, slowly, in fact, in collaboration with a psychologist, we work to reduce these outbursts in the midst of separation" (P1).* The physiotherapist plays a key role in positioning and achieving certain movements in the child when using an aid: *"Here we can now, I do not know, involve a physiotherapist so that he puts the child in a stand or some optimal position, ..." (P6).* The health manager is also mentioned as an important member of the professional team: *"If it is about some health problems, we always include the health manager, who is also part of the team and who very often helped me with some specific diagnoses, with some specific conditions." (P1)*

The participants assess the overall quality of cooperation within the team as good: *"The cooperation with the kindergarten team was excellent when I worked in the group. This included the physiotherapist, SLT, psychologist, and rehabilitator" (P1). "I cooperate with parents, the educator from the group, and the SLT from the professional team. Together we decide which aid to introduce and how to use it" (P8).* They find cooperation with parents significantly more challenging: *"Most of the time we have poor cooperation with families, not only regarding the technology itself but in general" (P4). "Parents always have high expectations of us, and we do not rely too much on them, but rather on professional workers" (P2). "Yes, I agree, it is the same for me. I can only speak about PECS, which I have used with parents, and it depends on the parents' willingness. Some accept the work, others not so much, and they leave it to us" (P6).*

Collaboration with other institutions and schools regarding AT

Participants describe cooperation with other preschool institutions and offices as high quality: *"Perfect. Even with other private offices and other kindergartens (…)" (P2).* However, cooperation with schools has proved more challenging: *"And I would like to say in closing that I would like us to have perhaps a little better cooperation. We have it with certain schools, but in general, we should work on ensuring that when our child goes to school, the school is prepared and has what the child needs." (P2)* Nevertheless, there are certain schools with which excellent cooperation has been achieved: *"Here, I will always single out, as I said for the first time, the example of school X, which, before the child came to school, called V1, bought what the child needed. The teacher got informed, and the entire team of experts attended the meeting. The same goes for school Y, but there were two schools, three – here are three. There was another school, a year or two ago, maybe three. So, three schools got informed on time, or ahead of time, obtained everything the child needed, sought education, and later sought monitoring." (P2)*

They achieve cooperation in different ways, most often through education and demonstrations*: "I have a specific example where I am currently teaching a preschooler to type on a laptop keyboard to make it easier for him at school, and now there is cooperation with the school where I also show them how he knows how to use a laptop, and with the parents... We hope that the school will then implement it later" (P6), "And we also had training for school employees for AT" (P2),* They also cooperate through the production of materials and various projects: *"... she did not mention that manual Assistive Technology through Play ... and good cooperation with Z, and we have now used games from that manual for the Erasmus+ project" (P5).*

Challenges and support needs

Participants mention numerous challenges in their work, the most notable being the lack of time: *"There is always a lack of time, that is the first thing" (P2), "Yes, and perhaps better organisation of time, I do not know" (P6), "I do not know, if we had more time to devote to implementing the device itself and with parents" (P5),* In addition to the lack of time, technical problems also pose a significant challenge: "*The updates you mentioned, it*

happens, you turn it on, you start working with the child, so that is something that happens. Or the tablet just freezes, and the child waits, waits, waits for that. And those are things that, well, we cannot influence" (P2). The excessive dispersion of responsibility for devices also proved to be a challenge: *"And on the other hand, if an expensive device breaks within two months, no one is responsible, there is no money. And then you have a pile of these things that are half-useful, that you cannot use properly, and in fact no one is responsible anymore, nor can we get new ones" (P1).*

Difficulties also arise from excessive expectations, both from parents: *"but parents usually have too high expectations and high demands, and they would not really do much" (P2),* and from educational rehabilitators: *"It is simply difficult for me to clarify some things and then I impose high expectations on myself. Then I get frustrated: 'Oh, maybe it is me. I failed'" (P4).* Such expectations lead to unrealistic goals: *"I think we are globally assessing the goals poorly" (P1), "We set them too high" (P3).* Participants also mention poor information about AT as a challenge: *"The biggest challenge is children and their capabilities, then their educators and parents. It would be necessary to improve information about the needs of applying AT in the wider environment, education, information tools, education of parents and persons who are in direct contact with the child, tools" (P7).*

However, difficulties in setting goals are also related to the demands of group dynamics: *"Is the purpose to enable one child to master something, ah, something... literally one answer or one request, and that it costs I do not know how much, and that we now destroy it because I had to enable it for him. I mean, there are many levels that we go through before we put something on the table." (P1)*

Challenges in implementation are also related to continuity in the application of AT: *"The biggest challenges are related to the inability to systematically use AT. Our children are often irregular in attending kindergarten, either because of various illnesses or because of other therapies they attend." (P8)*

Respondents emphasise the need for support in several areas. They believe they require constant technical support: *"I repeat technical support again and here someone in charge of that because we cannot inspect everyone" (P2), "That work technician who will check everything" (P2).* They also feel they need systematic methods of assessment, monitoring, and evaluation for AT: "*And for those measuring instruments, it would be easier for me if there was a measuring instrument for AT" (P5), "Yes, maybe it would be better if we united, not only at our level, but at the level of that device so that there would be a checklist, so that not every institution, for example, does not have one" (P6).*

Participants also emphasise the need for daily separation of the child for individual work: *"For me, for example, daily separation of the child from the group for individual work. Not once a week, but every day." (P4)* They especially highlight the need for a dedicated office and a professional who would work specifically with AT: *"One person and one space that would really sharpen the senses and be able to notice in the child after a while how, what and when... And one person to do it and I to be the one who will implement it through daily work within the framework that is given to me and then" (P1), "A separate space in which, as a therapist, I would have a calmer and quieter atmosphere in individual work with the child, considering that I work in a group for children with disabilities, would mean a lot to improve the quality of AT application at my workplace." (P8)* For the results of the work to be long-term, it is necessary to ensure transitional programmes: *"and that is something that our system may be missing. Something that will be a transition between kindergarten and school, and so that someone can educate teachers and other participants in the education system." (P2)*

As an important condition for improving the use of AT, participants also mention the need for better education for all involved*: "Since I always lag behind the younger colleagues in IT skills, I would benefit from new knowledge in using new applications and software." (P9) "Better preparation, information, and acceptance by educators regarding the importance of using AT for each child." (P7)*

Some participants emphasise that they do not need additional support in their work: *"Currently, I do not need additional support for using AT in my work. In our kindergarten, we are well supplied with various aids and forms of AT, I cooperate well with colleagues from the group, with the director, and with the expert team. If there is a need to purchase new aids and forms of AT, the options are always open. Most of the kindergarten employees have undergone training in using AT, so we all participate in using it together." (P8)*

4. Discussion

This research provided insight into the importance of educational rehabilitators in the implementation and application of AAC and recommends that future studies include the perspectives of the entire professional team. Teamwork and a transdisciplinary approach have been shown to be key to the successful application of AT, so including a wider range of experiences in the scientific context would be valuable. Attention should also be given to the broader population of children with disabilities, especially those with multiple disabilities. Participants rated working with children with multiple disabilities as the most demanding, and there is very little existing research on this topic in Croatia.

The need for standardised assessment and evaluation instruments also emerged as important. Respondents stated that they feel well educated in the field of AT; however, most of their assessment and evaluation is limited to observation. Therefore, questions arise about the quality and comprehensiveness of education in AT, and its consideration as a concept that encompasses not only products, but the entire process from assessment to use and evaluation of success (WHO and UNICEF, 2022). Some respondents reported dissatisfaction with the progress achieved, frustration, and poor goal setting. Introducing structured monitoring and assessment methods can facilitate insight into a child's strengths and abilities, and increase satisfaction with their own work (Ahmad, 2015).

Respondents also emphasise the importance of the personal and professional characteristics of individual experts in introducing AT, which has been shown to be a significant predictor of successful implementation in some earlier studies. Respondents further highlight the influence of age on the perception of technology and innovations in general, and consequently on AT. It would therefore be worthwhile to examine the effects of generational differences on the perception of AT. Support and guidance from a competent expert within the institution have proven important, raising the question of the potential benefits of introducing supervision programmes in the field of AT. As one solution, participants suggest establishing a specialised cabinet at the institutional level to facilitate individual work with children and support other experts. Participants state that they require daily technical support in the workplace. Many devices are easily broken and highly susceptible to damage, which, together with the lack of applications in the Croatian language, can cause significant challenges at work. These points indicate the need to establish more specialised AT centres at the regional level. Participants cite the lack of continuous use of AT as a challenge, which reduces the quality and effectiveness of AT. The need for additional training of experts is also mentioned, as well as the introduction of AT to educators, professional associates, parents, and all those who make up the team involved in implementing and applying AT.

It is important to note that our study has limitations, and the results cannot be generalised. We interviewed only nine teachers, which is a small sample and not representative of Croatia as a whole. Nevertheless, specific insights into the work dynamics of educational rehabilitators were obtained, and questions and topics of potential importance for the development of the profession and the well-being of children with developmental disabilities were raised.

5. Conclusion

Assistive technology has become an indispensable part of the work of educational rehabilitators. Through its use, alongside a transdisciplinary and inclusive approach, children can receive support that enables them to reach their full potential, develop their skills, and gain access to equal participation in everyday life. High-quality teamwork among experts, and between experts, families, and the end user, is essential for the effective and successful application of AT.

Assistive technology makes life easier not only for the user, but also for those around them and for the professionals who work with them. It can enhance the quality of the parent-child relationship and provide a greater sense of

achievement and satisfaction for professionals. Therefore, its benefits in working with children with disabilities are unquestionable. However, the implementation of AT presents its own challenges, which, combined with existing difficulties in practice, can seem overwhelming for professionals. It is therefore crucial to provide high-quality education for all team members. Advanced education and a structured approach to the introduction of AT are key to success. Despite significant challenges in this area, scientific and practical interest in AT is growing in the Republic of Croatia, offering hope for broader and higher-quality application in the future.

6. References

Ahmad F. K. (2015). Use of Assistive Technology in Inclusive Education: Making Room for Diverse Learning Needs. *Transcience 6*(2), 62-77. https://www2.hu-berlin.de/transcience/Vol6_No2_62_77.pdf

Beigel, A. R. (2000). Assistive Technology Assessment: More Than the Device. *Intervention in School and Clinic*, *35*(4), 237-243. https://doi.org/10.1177/105345120003500407

Boger, J., Jackson, P., Mulvenna, M., Sixsmith, J., Sixsmith, A., Mihailidis, A., … Martin, S. (2016). Principles for fostering the transdisciplinary development of assistive technologies. *Disability and Rehabilitation: Assistive Technology, 12(*5), 480–490. https://doi.org/10.3109/17483107.2016.1151953

Botelho, F. H. F. (2021). Childhood and Assistive Technology: Growing with opportunity, developing with technology. *Assistive Technology*, *33*(sup1), 87–93. https://doi.org/10.1080/10400435.2021.1971330

Committee for Ethics in Science and Higher Education. (2006). *Code of ethics of the Committee for Ethics in Science and Higher Education.* https://mzom.gov.hr/UserDocsImages/dokumenti/StrucnaTijela/Eti%C4%8Dki%20kodeks%20odbora%20za%20etiku%20u%20znanosti%20i%20visokom%20obrazovanju.pdf

Croatian Qualifications Framework (2022). Occupational standard – Educational rehabilitator. *Croatian Qualifications Framework Register.* https://hko.srce.hr/registar/standard-zanimanja/detalji/358

Da Fonte, M. A., i Boesch, M. C. (2016). Recommended augmentative and alternative communication competencies for special education teachers. *Journal of International Special Needs Education, 19*(2), 47–58. https://doi.org/10.9782/2159-4341-19.2.47

Delzotto, I. (2022). Quality assessment of the needs for the application of assistive technology. ATTEND conference „Our way“ (unpublished presentation). Opatija: CARNET.

Desideri, L.F., Mingardi, A., Stefanelli, B., Tanzini, D., Bitelli, C., Roentgen, U.R., & Witte, L.P. (2013). Assessing children with multiple disabilities for AT: A framework for quality assurance. *Technology and Disability, 25*(3), 159-166. https://doi.org/10.3233/TAD-130378

Federici, S., Scherer, M.J., & Borsci, S. (2014). An ideal model of an AT assessment and delivery process. *Technology and Disability, 26*(1), 27-38. https://doi.org/10.3233/TAD-140402

Lisak N. (2023). Internal materials from the course Qualitative Data Analysis, Faculty of Education and Rehabilitation Sciences, University of Zagreb, academic year 2022/2023.

Lohmann, M. J., Hovey, K. A., Gauvreau, A. N., & Higgins, J. P. (2019). Using Assistive Technology Tools to Support Learning in the Inclusive Preschool Classroom. *The Journal of Special Education Apprenticeship, 8*(2). https://doi.org/10.58729/2167-3454.1090

Moorcroft, A., Scarinci, N., & Meyer, C. (2019). A systematic review of the barriers and facilitators to the provision and use of low-tech and unaided AAC systems for people with complex communication needs and their families. *Disability and rehabilitation. Assistive technology*, *14*(7), 710–731. https://doi.org/10.1080/17483107.2018.1499135

Ochieng NT, Wilson K, Derrick CJ, Mukherjee N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*. *9*, 20–32. https://doi.org/10.1111/2041-210X.12860

Official Gazette (2022). *Act on Educational and Rehabilitation Activities* (NN 18/2022). https://narodne-novine.nn.hr/clanci/sluzbeni/2022_02_18_183.html

Perić, A. (2022). *Assistive technology in the clinical practice of educational rehabilitators (Master thesis).* Zagreb: University of Zagreb, Faculty of Education and Rehabilitation Sciences. https://urn.nsk.hr/urn:nbn:hr:158:855015

Pinjatela, R., & Vinceković, I. (2023). *Assistive Technology Needs Assessment. ATTEND e-course: A guide to achieving equal opportunities for students with disabilities.* https://usavrsavanja.carnet.hr/, licence CC BY-NC-SA 4.0 international

Tamakloe, D., & Agbenyega, J. S. (2017). Exploring Preschool Teachers' and Support Staff's Use and Experiences of Assistive Technology with Children with Disabilities. *Australasian Journal of Early Childhood, 42*(2), 29-36. https://doi.org/10.23965/AJEC.42.2.04

University of Zagreb. (2009). *Code of ethics.* https://www.unizg.hr/fileadmin/rektorat/O_Sveucilistu/Dokumenti_javnost/Propisi/Pravilnici/Eticki_kodeks.pdf

WHO & UNICEF (World Health Organization & United Nations Children's Fund) (2022). *Global report on AT*. Geneva. https://www.who.int/publications/i/item/9789240049451

7. Author Declaration

The authors confirm the originality of the work.

The authors declare no conflicts of interest.