



ivrap

Virtual reality to support learning

RECOMMENDATIONS TO POLICY-MAKERS

Immersive Virtual Reality as a Tool for Autistic
Pupils and Teachers project (IVRAP)



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The Immersive Virtual Reality as a Tool for Autistic Pupils and Teachers Project (IVRAP) aims to help autistic students work more independently and to create a context where they learn to learn other skills. In order to do so, IVRAP has developed and assessed an Immersive Virtual Reality (IVR) educational tool. The project brings together universities, and autism associations, professionals and NGOs across Europe

IVRAP TACKLES THE LACK OF ADEQUATE SUPPORT FOR AUTISTIC LEARNERS IN EDUCATION IN AN EVOLVING CONTEXT

Autism is a complex lifelong developmental disability experienced differently by each individual. An estimated seven million people in Europe are on the autism spectrum. Autistic people, irrespective of their support needs, face a high level of discrimination and exclusion in all aspects of life, including education and vocational training, notably resulting in poor employment outcomes. For them to fully benefit from inclusive education, the specific needs of autistic learners must be met.

It is estimated that 32-50% of autistic people also have intellectual disability/learning difficulties. Autistic learners progress much better when specific educational supports are provided. Visual supports for both receptive communication (daily agendas, individual work-systems, tasks panels, tasks structures, etc.) and expressive communication (alternative communications systems based on picture-exchange to communicate what they need, and to share ideas with others) are examples of autism-specific supports that have evidence for their effectiveness (Mesibov and Howley, 2003). However, this support is too often lacking at school.

The COVID 19 pandemic exacerbated the lack of access to education for disabled children as highlighted in [Autism-Europe's report](#). It fuelled the need for further alternative ways to learn how to learn for autistic people and their teachers.

Augmentative, alternative, and immersive forms of learning as a result become all the more relevant, as highlighted in EU's [Digital Education Action Plan for 2021 - 2027](#). The EU has recently adopted recommendations for EU Member States [on blended learning approaches for high-quality and inclusive primary and secondary education](#).

Article 24 of the **United Nations Convention for the Rights of Persons with Disabilities (UNCRPD)** “recognize(s) the right of persons with disabilities to education (...)” and the importance of providing Effective individualized support measures“



The EU's [Strategy for the Rights of Persons with Disabilities 2021-2030](#) also highlights the need for “systematic research (...) on the conditions necessary for learners with disabilities to succeed, including learners with invisible disabilities such as autism, dyslexia, or hyperactivity.”

WHAT EXACTLY IS IVRAP AND WHY IS IT BENEFICIAL?

The Immersive Virtual Reality as a Tool for Autistic Pupils and Teachers project (IVRAP) is based on the combination of one of the most extended models of autism intervention on education (named Individual Work System) with the power of Immersive Virtual Reality (IVR) and Hand-Tracking sensors to manipulate virtual environments. The individual work system is defined as a visually organized space where children practice acquired skills (Schopler et al. 1995).

A work system visually communicates at least four pieces of information to the student including (1) the tasks the student is supposed to do, (2) how much work there is to be completed, (3) how the student knows they are finished, and (4) what to do when they are finished (or “what’s next”). The work system provides a structured opportunity for students to practise skills deliberately and independently. Individual work systems may also promote students’ generalization of skills across settings.

ADVANTAGES OF USING VIRTUAL REALITY FOR INDIVIDUAL WORK SYSTEM INCLUDE:

- Attracting learner's attention by highlighting relevant information at each step (by increasing prominence or salience of items to be handled) with additional light or sounds
- Error-free learning, not allowing incorrect handling of objects in early stages of system use
- Control of sensory load, starting with little or no competing stimuli and moving towards more realistic scenario in later stages of system use, to facilitate generalization and transition to real (non-virtual) scenarios

IVRAP found that VR is useful as a means of developing skills for autistic people especially those with intellectual disabilities. Based on the pilot use of the tool:

- The IVRAP tool has proved useful to improve social skills of many learners
- IVRAP provided opportunities for some learners to (re)integrate into different areas of curriculum
- Combining fun and learning proved to be a very effective educational experience



WHAT DID TEACHERS AND STUDENTS THINK ABOUT USING IVRAP FOR LEARNING IN THE CLASSROOM?

Both **teachers and students found IVRAP highly usable**, according to the results of the feasibility study and proved **very enthusiastic** about the possible use of this tool in the classroom.

WHAT DID TEACHERS LIKE THE MOST ABOUT THE IVRAP TOOL ACCORDING TO THE FEASIBILITY STUDY?

- It made it very easy to plan the sessions
- The contents are very motivating for users
- It is really flexible and allows customization
- Being more interactive as you can use your hands (much better than with controllers)
- A huge sense of reality
- Very well structured and organised
- Enthusiastic to use VR for many other competences areas in the Curriculum
- Comfortable, motivating and funny space

WHAT FUNCTIONS WOULD TEACHERS MOST LIKE TO USE IVRAP FOR?

- For classroom activities where visual support is very important
- Very useful for students with important learning disabilities
- For training students on logic/mathematics and literacy skills

THUS, IVRAP RECOMMENDS TO EU POLICY-MAKERS:

- 1. Supporting research to further investigate the benefits of VR / digital tools and how their use can be fostered in primary and secondary education**, including vocational education and training to support learning of autistic people and other groups, with the adequate involvement of the autism community;
- 2. Exploring ways to best incorporate VR learning in blended learning approaches in primary and secondary education, including vocational education and training**, for the benefit of autistic learners and other groups;
- 3. Boosting the digital capacity of the education and training systems by encouraging investment** at school and community levels in technological devices;
- 4. Systematically embedding autism-specific training in teachers' curricula with the development of appropriate initial and advanced training**, including practical and field-based experiences, as well as access to current research and best practice teaching strategies, in order to address challenges regarding the skills, knowledge and expertise of educators working with autistic children across educational settings.
- 5. Ensuring that accurate understanding of autism and the importance of individualisation of learning and teaching are central to the teachers and other education professionals' training** to ensure the specific needs of each autistic learner are met. Foster the use of practical, evidence-based strategies to support curriculum access and social inclusion as well as training in a range of appropriate eclectic strategies and tools (including digital and VR tools) to cater for the diversity of the profiles and the learners' needs.
- 6. Developing online and on-site pedagogical modules and resources to help teachers and trainers adapt their teaching methods and practices to blended learning approaches and the use of new technology, including VR.** It is essential to engage with them in the use of new tools and materials, including how to operate safely and ethically in digital environments and how to support students in doing so.
- 7. Supporting teachers' self-assessment on use of digital technologies, including VR**, as well as upskilling courses and other forms of professional learning for teachers and trainers to help them use and embed VR tools in teaching autistic learners.