

Project number: 2021-1-DE02-KA220-VET-000033091

## ONLINE TRAINING: AR AND VR FEATURES FOR PROFESSIONALS. SPECIAL NEEDS APPROACH

### **TI.2 CURRICULUM DEFINITION**



The materials produced by the Bit the Spectrum consortium are licensed under a Creative Commons NonCommercial license. This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.





#### Table of content

INTRODUCTION	
CURRICULUM DEFINITION	5
Curriculum Template	
QUALIFICATION UNIT	7 7
LEARNING OUTCOMES DELIVERY METHODS	
ASSESMENT CRITERIA ECVET -The European Credit System for Vocational Education and Training EQAVET - European Quality Assurance in Vocational Education and Training	
EQF - European qualifications framework NQF - National qualifications frameworks	
STRUCTURE OF THE TRAINING COURSE	
Introduction to the training materials development – T1.3	
Structure of the Units H5P	
References	20
Attachments	





### **INTRODUCTION**

BIT THE SPECTRUM (BTS) is an Erasmus+ Project that promotes social inclusion through the use of Augmented Reality (AR) and Virtual Reality (VR) in specific therapies for students with autism spectrum disorder (ASD). The objective is to increase the quality of the educational and "caregiving" process of the staff working with people with autism, specifically Vocational Education and Training (VET) teachers, providing innovative tools for that aim.

Different studies using Augmented Reality (AR) and Virtual Reality (VR) with children with autism indicate that AR/VR facilitates practicing and learning social skills, improves students' selective attention for more time, helps children to learn new things and helps children to better understand the facial expressions and emotions.

Augmented Reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are enhanced by computer-generated perceptual information, whereas Virtual Reality (VR) is a realistic three-dimensional or artificial environment that is created with a mixture of interactive hardware and software. The user accepts the artificial (or virtual) environment as real and interacts with it on the same way that he/she interacts with the real (or physical) world.

In this context, the consortium of the project Bit the Spectrum intends to develop five different results, being the first one an *Online training course about AR and VR features for VET professionals dealing with students with autism* with updated materials about these technologies and its use, including general introductory units about the use of technologies in special education as well as units about the methodologies needed to create AR/VR exercises with an approach to special education and autism spectrum disorder.

This document will cover the development of the *curriculum (T1.2)*, which different parts will be later explained and where the structure, content and assessment of the training course will be defined.





Different activities have been undertaken in order to arrive to the development of the curriculum. These activities were included in the **Report on Skills in ICT sector, VET and Special education** (**T1.1**), and are the following:

- <u>Desk research</u> about the last trends in Augmented Reality but specifically in Virtual Reality where 360<sup>o</sup> Immersive Reality has been analyzed.
- <u>Survey</u> where the state of the professionals in the use of those technologies has been checked. Through the distribution of surveys, the skill needs are based as well in the feedback of external actors of the project.
- Two focus groups where the needs of external professionals have also been identified.

During these tasks, the consortium has analyzed the skills needs in the different target learners. On one hand, the knowledge of special education and VET teachers about VR/AR and its potential use in special education has been analyzed. On the other hand, ICT specialists were asked about their knowledge about how to treat the end-user (students with ASD).

Taking into account the results of the previous activities, the needs about technology of nontechnical teachers and about ASD and disability of ICT experts have been identified leading to the design of the joint curriculum, defining the different Units that will be exposed later in this document.

By the end of the training course, the professionals that undertake it will be skilled on Virtual and Augmented Reality, and in the work with ASD students. We expect to raise sensitivity as well so that they consider these technologies as a good investment to improve the quality of their work, benefiting the end user.





### **CURRICULUM DEFINITION**

"Curriculum is a standards-based sequence of planned experiences where students practice and achieve proficiency in content and applied learning skills. Curriculum is the central guide for all educators as to what is essential for teaching and learning, so that every student has access to rigorous academic experiences. The structure, organization, and considerations in a curriculum areated in order enhance student learning facilitate instruction.". to and (https://www.ride.ri.gov/InstructionAssessment/Curriculum/CurriculumDefinition.aspx#:~:text=Cu rriculum%20is%20a%20standards%2Dbased,access%20to%20rigorous%20academic%20experienc es., s.f.)

## In few words, the curriculum refers to the collection of lessons and academic content taught in a specific course or program of study.

The curriculum that we will define will take into account European Union standards of Vocational Education and Training such as **ECVET** (The European Credit System for Vocational Education and Training), **EQF** (European qualifications framework) and the **EQAVET** framework (European Quality Assurance in Vocational Education and Training). The approach of **Learning Outcomes** will be used describing the *knowledge, skills* and *competences* for each Learning Outcome.

One single **qualification**, with four training **units** will be developed:

- Unit A: The use of Technology in Special Education.
- Unit B: Special Educational Needs and Autism.
- Unit C: Methodologies for the development of exercises.
- Unit D: Extended Realities.





## **Curriculum Template**

The curriculum template offers a clear picture of the different elements of the joint curriculum. It serves as a guide about the structure of the training course and the characteristics of the different elements of the educational program:

Qualification	Formal outcome of an assessment and validation process which is obtained when a competent institution determines that an individual has achieved learning outcomes to a given standard.					
Unit	Component of a qualification, consist	ting of a coherent set of knowledge, skil	Is and competence, which ca	n be assessed and validated.		
EQF level		National Qualification Framework Levels				
	Germany	italy	Spain	Finland		
More info here: https://europa.eu/europas s/en/description-eight-eqf- levels						
Associated EQVET points	Numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the qualification.					
Learning Outcomes: Stat	ements of what a learner knows, understands and is able to do on cor	npletion				
Sub-unit	Knowledge	Skills		Competences		
Subunit 1 title	The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that are related to a field of work or study.	Ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive or practical.		The proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development.		
Subunit 2 title						
Subunit 3 title						
-	Cubunit 1 title		Online, Blended, Onsite. Nur	mber of slides, number of book/pages, number/duration of videos,		
	Subunit I title		Authorizing tools used (e.g. Articulate 360, Scorm, HSP,) ,			
Delivery Methods	Subunit 2 title					
L	Subunit 3 title					
	Subunit 1 title		Methods and processes used to establish the extent to which a learner has attained particular knowledge, skills and competence.			
Assessment Criteria	Subunit 2 title		Multiple choice questionaries, minum scores, final project,			
	Subunit 3 title					

The Unit Description Template will include the basic information for the description of units using ECVET principles:

-The generic title of the qualification.

-The generic title of the unit.

-The reference of the qualification according to the EQF and NQF (National qualifications

frameworks) levels.

-The learning outcomes contained in the units, in terms of knowledge, skills and competences.

- The delivery methods for the specific learning outcomes.

-The procedures and criteria for assessment of such learning outcomes.

-The ECVET points associated.







These are the key elements to considerate:

### QUALIFICATION

The qualification is the formal outcome of an assessment and validation process which is obtained when a competent institution determines that an individual has achieved learning outcomes to a given standard.

Our curriculum will comprise one qualification: "AUGMENTED AND VIRTUAL REALITY
FEATURES FOR VET PROFESSIONALS FROM A SPECIAL EDUCATION APPROACH"

#### UNIT

A unit is a component of a qualification, consisting of a coherent set of knowledge, skills and competence.

Each unit is documented and the learning outcomes it contains are assessed, and validated. Hence learners can:

• Progressively (unit-by-unit or set of units by set of units) accumulate learning outcomes in view of achieving a qualification;





• Obtain recognition for their learning outcomes achieved in other contexts without new assessment.

> Our qualification will involve *four different units*:

- <u>Unit A</u>: The use of Technology in Special Education.
- <u>Unit B</u>: Special Educational Needs and Autism.
- <u>Unit C</u>: Methodologies for the development of exercises.
- <u>Unit D</u>: Extended Realities.

### LEARNING OUTCOMES (or sub-units)

In the European qualifications framework (EQF), learning outcomes are defined as statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined as knowledge, skills and competences.

(European Parliament and Council of the EU, 2008, Annex I).

The CEDEFOP – European Centre for the development of the Vocational Training, states that in ECVET, learning outcomes are used as a basis for credit transfer and accumulation. Learning outcomes are not dependent on the learning process or the learning context in which they have been achieved and therefore it is possible to use them to identify whether what the learner has achieved in one learning setting or context is comparable to what s/he is expected to have achieved in another setting or context.

a) for the learner: learning outcomes statements clarify what a learner is expected to know and be able to do and understand having completed a learning sequence, a module, a program or a qualification.

b) for the teacher/instructor: the learning outcomes approach helps to orient teaching, to select methods and to support the learning process.





Learning outcomes statements help to clarify program and qualifications intentions and make it easier for those involved – learners, parents, teachers or assessors – to work towards these expectations.

Each learning outcome is settled with the definition of the knowledge, skills and competences:

- KNOWLEDGE (Cognitive competence): The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that are related to a field of work or study.
- **SKILLS** (Functional competence): The ability to apply knowledge and use know-how to complete tasks and solve problems.
- COMPETENCES (Behaviors and attitudes): The proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development.

Learning-outcomes-based curricula have to be defined and written in a way that 'speaks to' learners and teachers and adds value to the learning process. There is no single way of defining and writing learning outcomes; the approach has to reflect the particular purpose and context in question.

#### **DELIVERY METHODS**

Delivery methods are the pedagogical or teaching methods, including instruction, practice, and feedback.

Delivery methods can vary for example, from the format used to offer the educational program, whether it is online or blended, to onsite; they can differ from number of slides, of book pages, from the duration of the videos, etc.

When talking about delivery methods we can also include the authorizing tools used for the specific course, such as Articulate 360, Scorm, H5P...





Learning outcomes may be acquired through a variety of learning pathways and modes of delivery and it will be important to analyze what delivery method better suits the specific learning program.

In the present curriculum, the delivery method will consist on an online training course set up through the authorizing tool H5P.

The different units will include slides, videos, and interactive exercises among others.

### ASSESMENT CRITERIA

We can define them as the methods and processes used to establish the extent to which a learner has attained particular knowledge, skills and competence. Assessment criteria make it clear to learners what they are expected to do. It shows them how they can demonstrate they've achieved the learning outcomes.

Some assessment criteria can come in the form of multiple-choice questionaries, minimum scores, final projects and so on.

In the present curriculum, the assessment criteria followed will involve quizzes and case study exercises, among others.

## ECVET -The European Credit System for Vocational Education and Training

ECVET is a tool that supports lifelong learning and flexibility in learning pathways. It relies on a series of common goals, principles and technical components that foster transparency and comparability in VET.

*ECVET points*: This is the numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the qualification.

Together with units, descriptions of learning outcomes and information about the level of qualifications, ECVET points can support the understanding of a qualification.





The number of ECVET points allocated to a qualification, together with other specifications, can indicate for example, that the scope of the qualification is narrow or broad.

The number of ECVET points allocated to a unit provides the learner with information concerning the relative weight of what s/he has accumulated already. It also provides the learner with information concerning what remains to be achieved.

In the present curriculum, the ECVET points allocated to the qualification will be 2

## EQAVET - European Quality Assurance in Vocational Education and Training

The European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET) emerged from the 2009 recommendation of the European Parliament and Council, as a European wide framework to support quality assurance in vocational education and training (VET) across Europe.

EQAVET is based on a quality assurance and improvement cycle (planning, implementation, evaluation/ assessment, and review/revision) and a selection of descriptors and indicators applicable to quality management at both VET system and VET provider levels.

EQAVET does not prescribe a particular quality assurance system or approach, but provides a framework of common principles, indicative descriptors and indicators that may help in assessing and improving the quality of VET systems and VET provision. EQAVET can therefore be regarded as a 'toolbox,' from which the various users may choose those descriptors and indicators that they consider most relevant to the requirements of their quality assurance system.

### EQF - European qualifications framework

The Framework for Qualifications of the European Higher Education Area provides descriptors for three cycles agreed by the ministers responsible for higher education at their meeting in Bergen in May 2005 in the framework of the Bologna process. Each cycle descriptor offers a generic statement





of typical expectations of achievements and abilities associated with qualifications that represent the end of that cycle.

1. The descriptor for the short cycle developed by the Joint Quality Initiative as part of the Bologna process, (within or linked to the first cycle), corresponds to the learning outcomes for EQF level 5.

- 2. The descriptor for the first cycle corresponds to the learning outcomes for EQF level 6.
- 3. The descriptor for the second cycle corresponds to the learning outcomes for EQF level 7.
- 4. The descriptor for the third cycle corresponds to the learning outcomes for EQF level 8.



Source: https://www.maintworld.com/R-D/Application-of-European-Qualification-Framework-EQFC-in-Maintenance

Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.			
	Knowledge	Skills	Responsibility and autonomy





	In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility
Level 1 The learning outcomes relevant to Level 1 are	basic general knowledge	e basic skills required to carry out simple tasks	work or study under direct supervision in a structured context
Level 2 The learning outcomes relevant to Level 2 are	basic factual knowledge of a field of work or study	basic cognitive and practical skills required to use relevar information in order to carry out tasks and to solve routin problems using simple rules and tools	work or study under tsupervision with some autonomy e
Level 3 The learning outcomes relevant to Level 3 are	knowledge of facts, principles, processes and general concepts, in a field of work or study	a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	take responsibility for completion of tasks in work or study adapt own behaviour to circumstances in solving problems
Level 4 The learning outcomes relevant to	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specifi problems in a field of work or study	exercise self-management within the guidelines of work cor study contexts that are usually predictable, but are subject to change





Level 4 are			supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5 The learning outcomes relevant to Level 5 are	comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	exercise management and supervision in contexts of work or study activities where there is unpredictable change review and develop performance of self and others
Level 6 The learning outcomes relevant to Level 6 are	advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts take responsibility for managing professional development of individuals and groups
Level 7 The learning outcomes relevant to Level 7 are	highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research critical awareness of knowledge issues in a field and at the interface between different fields	specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams





The Framework for Qualifications of the European Higher Education Area provides descriptors for three cycles agreed by the ministers responsible for higher education at their meeting in Bergen in May 2005 in the framework of the Bologna process. Each cycle descriptor offers a generic statement of typical expectations of achievements and abilities associated with qualifications that represent the end of that cycle.

Source: EQF Recommendation

In the present curriculum, the EQF level will be 4

### NQF - National qualifications frameworks

National qualifications frameworks consist of an instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labor market and civil society.

Here is the *table of equivalences* of the EQF levels with the NQF of each partner country in the project:





EQF 4	NQF			
Germany (DQF 4)	<ul> <li>Dual vocational education and training (three-year and three-and-a-half-year training courses)</li> <li>Berufsfachschule [full-time vocational school] (assistant occupations)</li> <li>Berufsfachschule [full-time vocational school](full vocational qualification)</li> </ul>			
Spain (MECU 4)	<ul> <li>Baccalaureate Degree.</li> <li>Vocational Training Technician Degree.</li> <li>Title of Technician of Professional Music Education.</li> <li>Title of Technician of Professional Teaching of Dance.</li> <li>Title of Technician of Plastic Arts and Design.</li> <li>Degree of Sports Technician.</li> <li>Certificate of Professionalism Level 2.</li> <li>Specialization Courses of Vocational Training</li> </ul>			
Finalnd (FiNQF 4)	<ul> <li>·General upper secondary education certificate / syllabus</li> <li>· Matriculation examination</li> <li>· Vocational upper secondary qualifications</li> <li>· Further vocational qualifications</li> <li>· Basic Examination in Prison Services</li> <li>· Fire Fighter Qualification</li> <li>· Emergency Response Centre</li> <li>· Operator Qualification</li> </ul>			
Italy (IQF 4)	<ul> <li>Diploma di istruzione tecnica - Upper secondary education diploma -Technical schools - Five-year technical schools (Higher education and research apprentice- ship programme)</li> <li>Diploma di istruzione professionale - Upper secondary education diploma - Vo- cational schools - Five-year vocational schools - (Higher education and research apprenticeship programme)</li> <li>Certificato di specializzazione tecnica superiore - Higher technical specialization certificate - Higher Technical Education and Training pathways (IFTS) - (Higher education and research apprenticeship programme)</li> </ul>			





## **STRUCTURE OF THE TRAINING COURSE**

As anticipated in the previous sections of this document, the online training course will consist of **One qualification** divided in **Four units** that will be further divided in **Eight learning outcomes**:

Learning Outcome	Introduction to Technology of Information and Communication Applications of ICT to special education/ of ASD students		UNIT A: The use of Technology in Special Education	
Learning Outcome	Special Educational Needs		UNIT B: Special	QUALIFICATION: AR AND VR FEATURES FOR VET PROFESSIONALS FROM A SPECIAL EDUCATION APPROACH
Learning Outcome	Autism Spectrum Disorder		Educational Needs and Autism	
Learning Outcome	Human Centered Design Methodology	UN	NIT C: Methodologies for	
Learning Outcome	Specific HCDM for this project		exercises	
Learning Outcome	Augmented Reality	UNIT D: Extended Realities		
Learning Outcome	Virtual Reality			

# Introduction to the training materials development – T1.3

The consortium will undertake the development of the training materials according to the present joint curriculum. We will produce lessons oriented to blended learning in the form of slides, tutorials, auto evaluation tests and audiovisuals. We will enrich them by using authorizing tools which will create online and dynamic training content that could be embedded in most of the Learning Management Systems (LMS). These tools concede the authorship of the training materials to our project but will foster their reusability in future courses. Authorizing tools transform the specification of the structure and content of a learning unit into chunks of web standard code (HTML5, CSS3, JavaScript) that build up the unit's webpages (e.g., any LMS).





Those lessons will be able to be improved by adding or mixing new materials on later courses based on Bit the Spectrum.

A transfer of knowledge, based on our course, to the consortium teachers will be done (T1.4). The aim of this last step will be:

- to test and validate the training materials
- allow to the team to effectively co-develop the next results of the project

### Structure of the Units

Each unit will follow the same structure and it will consist of:

0- INTRODUCTORY VIDEO: This video could consist on a green screen video with a presenter where the learning outcomes of the unit are outlined.

1- T<u>RANSPARENCIES</u>: The content included in each learning outcome of the units will be developed in the form of presentation slides, always showing the explanations in a visual and attractive format with clear concepts and options for further information.

2- INTERACTIVE EXERCISE: The specific interactive exercise selected will be up to the content creator within the variety of options contained in H5P authorizing tool.

3- SUMMARY: An outro/recap will be included at the end of the unit, where the information given will be wrapped up and will be useful to refresh what the student has learned before being tested.

4- QUIZ: a multiple-choice questionnaire will close the unit covering all the topics included.





### H5P

H5P is an abbreviation for HTML5 Package. This authorizing tool allows users to create, share and reuse interactive content. It is mobile-friendly and relatively simple to use. It concedes the authorship of the training materials to the creators and boosts the re-use and improvement of later courses based on those materials.

H5P allows you to create courses and presentations where a wide number of interactive tools and exercises can be included, making your content more attractive and practical for the user. Some of the interactions that you can add to your online content are:

- Drag and drop exercises
- Interactive videos
- Dialog Cards
- Charts
- Audio Recorder
- Arithmetic quizzes
- Flashcards
- Memory Games
- And many others...

**Eind**enta tutorial on how to use H5P to create interactive https://www.youtube.com/watch?v=7UH0qWudtp8, or navigate directly through H5P creating a one-month free account and test yourself! https://h5p.org/





### References

https://www.ride.ri.gov/InstructionAssessment/Curriculum/CurriculumDefinition.aspx#:~:text=Curr iculum%20is%20a%20standards%2Dbased,access%20to%20rigorous%20academic%20expe riences. (s.f.).

"ECVET Questions and answers", European Commission. 2011

### **Attachments**

- Curriculum template

