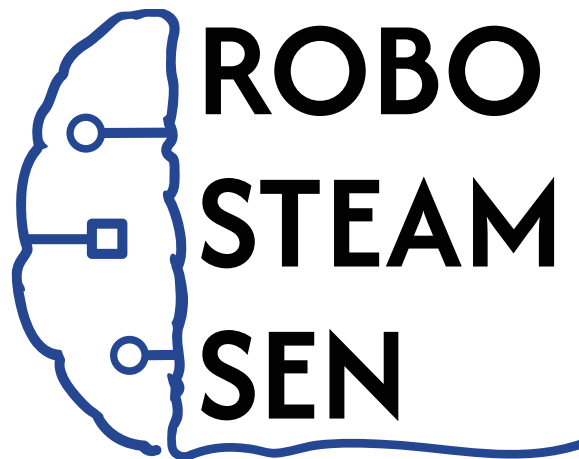


WP2.T2 Classification of Sample Resources

“WP2. Adapting Resources, Methodologies and Tools
by IDD”



**Training SEN teachers to
use ROBOTICS for fostering
STEAM and develop
computational thinking**

Project No. 2023-1-ES01-KA220-SCH-000155379



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1. Taxonomy use

Not all the taxonomy is required for the classification of resources, only the educational resource description, learning objective, activities and difficulty. These classes are shown in Figure 1 and specified more clearly in Figure 2.

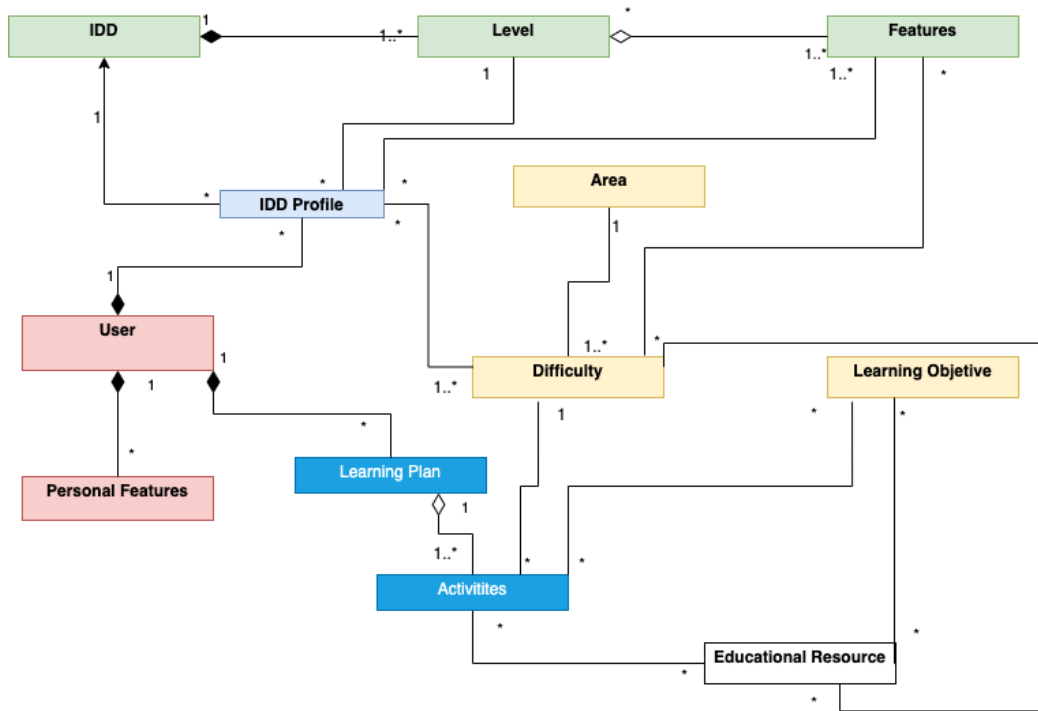


Figure 1. Taxonomy description proposal

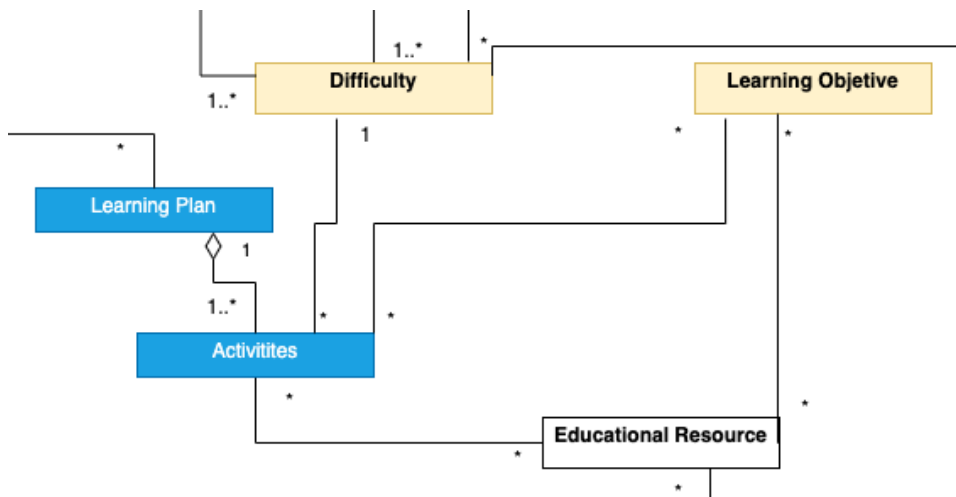


Figure 2. Taxonomy detailed proposal

Taking into account this part of the taxonomy, the taxons described by the partners and the resources compiled the result can be seen in the following tables.

Table 1. – Resource 1 by IPB

Resource Name: Extending Robot Therapy for Children with Autism Using Mobile and Web Application
Resource description <description can be done through a link>: Robot treatments for children with autism have proven to be successful and effective. However, the resources needed for the treatments do not always meet the needs of the children. The authors overcame the lack of equipment and staff by extending the concept of robot therapy using a web and mobile application. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9415984/
Sample of use in education with students with IDD <optional>: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9415984/
Describe the difficulty or difficulties addressed: Problems initiating and maintaining conversations; Solitary activities and limited engagement in social settings; Understanding social norms and rules; Adherence to Rigid Routines; Delayed or unusual speech patterns; Regulating Emotions; Expressing Feelings; Non-Verbal cues; Understanding facial expression or body language; Limited language use; Social communication and interaction with peers;
Describe an activity in which it can be applied: Emotion Charades - In this activity, students take understanding robot emotions (e.g., happy, sad, surprised) without speaking they guess the emotion being portrayed . This activity helps students practice interpreting nonverbal cues, communication, reconginizing emotions, express emotions and other difficulties expressed above. This can be later applied in a STEAM education context as students can understood teacher non verbal cues and emotions from what they have learned and better understand the explanations.
Describe one or several Learning Objectives with which it could fit: Improving Social Communication Skills; Relationship with peers and adults

Table 2. – Resource 2 by IPB

Resource Name: Expressive Humanoid Social Robot
Resource description <description can be done through a link>: QTrobot is an expressive social robot designed to support a variety of use-cases including education of children with autism and other special needs education and human-robot interaction research and teaching. https://luxai.com/#LearnMore
Sample of use in education with students with IDD <optional>: https://luxai.com/assistive-tech-robot-for-special-needs-education/
Describe the difficulty or difficulties addressed: Problems initiating and maintaining conversations; Solitary activities and limited engagement in social settings; Understanding social norms and rules; Adherence to Rigid Routines; Delayed or unusual speech patterns; Regulating Emotions; Expressing Feelings; Non-Verbal cues; Understanding facial expression or body language; Limited language use; Social communication and interaction with

peers;
Describe an activity in which it can be applied: Emotion Charades - In this activity, students take understanding robot emotions (e.g., happy, sad, surprised) without speaking they guess the emotion being portrayed . This activity helps students practice interpreting nonverbal cues, communication, recognizing emotions, express emotions and other difficulties expressed above. This can be later applied in a STEAM education context as students can understand teacher non verbal cues and emotions from what they have learned and better understand the explanations.
Describe one or several Learning Objectives with which it could fit: Improving Social Communication Skills; Relationship with peers and adults

Table 3. – Resource 1 by USAL

Resource Name: Social robot
Resource description <description can be done through a link>: https://en.wikipedia.org/wiki/Social_robot
Sample of use in education with students with IDD <optional>: https://dl.acm.org/doi/abs/10.1145/2838944.2838983
Describe the difficulty or difficulties addressed: Problems initiating and maintaining conversations; Understanding social norms and rules; Delayed or unusual speech patterns; Expressing Feelings; Non-Verbal cues; Social communication and interaction with peers; (Note: These resource could be used with much many difficulties but with these are sample that fits with the activity)
Describe an activity in which it can be applied: Peer Interview - Pair students with a social robot and that the student interview the robot and it ask and also the robot ask the student. Provide students with a list of conversation starters or interview questions to guide the conversation (e.g., favorite hobbies, interests, pets). Encourage students to actively listen the robot responses, ask follow-up questions, and share their own experiences. This activity promotes social interaction, turn-taking, and active listening skills.
Describe one or several Learning Objectives with which it could fit: Improving Social Communication Skills; Social Interaction and Communication; Improving Attention

Table 4. – Resource 2 by USAL

Resource Name: Minecraft
Resource description <description can be done through a link>: https://www.minecraft.net/en-us
Sample of use in education with students with IDD <optional>: https://www.researchgate.net/profile/Cathy-Atkinson/publication/380639280_Right_to_play_Challenges_and_opportunities_Editorial_policy_for_Educational_Child_Psychology/links/66473f5e22a7f16b4f303a75/Right-to-play-Challenges-and-opportunities-Editorial-policy-for-Educational-Child-Psychology.pdf#page=84
Describe the difficulty or difficulties addressed: Preference for solitary activities and limited engagement in social settings; Problems initiating and maintaining conversations;

<p>Tendency to engage in parallel play rather than interactive play may; Difficulty with organization and planning; Challenges with time management; Social interactions with peers; Short attention span; Do not follow through instructions;</p>
<p>Describe an activity in which it can be applied: Science Hunters Approach – The activity involves adults and students. Each session begins by introducing real-world scientific concepts and challenges. A themed Minecraft building activity is then presented, providing an opportunity for children to explore and advance their understanding of the topic. The majority of the session is then dedicated to creative and non-constrained building in Minecraft. While adults provide support and guidance, individual activities and outcomes are directed by the children themselves, who participate according to their skill level rather than their age. Students are collaborating among them.</p>
<p>Describe one or several Learning Objectives with which it could fit: Relationship with peers and adults; Organization; Focus; Organization of space; Improving Social Communication Skills; Improving attention; Improving Knowledge Application; Symbolic Thought; Learning Technology</p>

Table 5. – Resource 1 by ULE

<p>Resource Name: Pepper Robot</p>
<p>Resource description <description can be done through a link>: https://www.aldebaran.com/en/pepper</p>
<p>Sample of use in education with students with IDD <optional>: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1232177/full</p>
<p>Describe the difficulty or difficulties addressed: Solitary Activities and Limited Engagement in meetings; Adherence to Rigid Routines; Organization and planning; Time management; Cognitive Abilities</p>
<p>Describe an activity in which it can be applied: Pepper is used in an structured interaction scenario, the emphasis is on guided activities and problem-solving tasks. Pepper takes on the role of an instructor, presenting specific challenges or scenarios that require critical thinking, decision-making, and collaborative problem-solving. Pepper guides student through the different stages of problem-solving, offers feedback and suggestions, and encourages active participation. This scenario aims to foster cognitive skills, decision-making abilities, and collaboration in a structured and supportive manner.</p>
<p>Describe one or several Learning Objectives with which it could fit: Effective Studying promote reading comprehension; Develop functional writing skills; Learning Science concepts; Learning Technology concepts; Learning Engineering concepts; Learning Arts concepts; Learning Maths concepts</p>

Table 6. – Resource 2 by ULE

<p>Resource Name: Challenge Based Learning</p>
<p>Resource description <description can be done through a link>: https://www.challengebasedlearning.org/</p>
<p>Sample of use in education with students with IDD <optional>: https://www.theseus.fi/bitstream/handle/10024/346911/KanervoEskelinenSarlioSiintolaAyvari.pdf?sequence=2</p>

<p>Describe the difficulty or difficulties addressed: Understanding social norms and rules; Non interactive play; Intense focus; Adherence to Rigid Routines; Repetitive behavior; Organization and planning; Time management; Organization, attention and rules; Cooperative Interaction; Cognitive Abilities; Social communication and interaction with peers; Problems organizing tasks; Do not follow through instructions.</p>
<p>Describe an activity in which it can be applied: Involve the IDD student in a Challenge development addressed following ChBL and including also regular students, teachers and care takers. The students should address the challenge cooperating among them, distributing tasks, producing and presenting outcomes.</p>
<p>Describe one or several Learning Objectives with which it could fit: Effective Studying promote reading comprehension; Develop functional writing skills; Learning Science concepts; Learning Technology concepts; Learning Engineering concepts; Learning Arts concepts; Learning Maths concepts</p>

Table 7. – Resource 1 by UEF

<p>Resource Name: BeeBot</p>
<p>Resource description <description can be done through a link>: https://www.tts-international.com/bee-bot-programmable-floor-robot/1015268.html?cgid=Secondary-ICT-Bee-Bot-Blue-Bot -- Pro-Bot</p>
<p>Sample of use in education with students with IDD <optional>: https://unitedrobotics.group/en/blog/article/robot-autism-awakening-through-robotics</p>
<p>Describe the difficulty or difficulties addressed: Adherence to Rigid Routines; Organization and planning; Time management; Cognitive Abilities</p>
<p>Describe an activity in which it can be applied: “Navigating the Bee-Bot” was the robotics-based activity. Bee-Bot is a commercial educational robot in the form of a bee, which can be programmed to navigate on a 2D map to different locations. This user-friendly toy robot has several buttons on its back for programming. It can store a sequence of commands, directing it to move forwards/ backwards for a specific distance and turn left/ right.</p>
<p>Describe one or several Learning Objectives with which it could fit: Effective Studying promote reading comprehension; Develop functional writing skills; Learning Science concepts; Learning Technology concepts;</p>

Table 8. – Resource 2 by UEF

<p>Resource Name: Collaborative Learning</p>
<p>Resource description <description can be done through a link>: https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit/collaborative-learning-approaches#:~:text=is%20the%20evidence%3F,What%20is%20it%3F,together%20on%20a%20shared%20task.</p>
<p>Sample of use in education with students with IDD <optional>: https://www.theseus.fi/bitstream/handle/10024/346911/KanervoEskelinenSarlioSiintolaAyvari.pdf?sequence=2</p>
<p>Describe the difficulty or difficulties addressed: Delayed or unusual speech patterns; Sharing a common focus; Conversational Problems;</p>

Understanding social norms and rules; Non interactive play; Organization, attention and rules; Cooperative Interaction; Cognitive Abilities; Social communication and interaction with peers; Unability to follow instructions;
Describe an activity in which it can be applied: Treasure Hunts. The goal of the Treasure Hunts is to improve students' comprehension and understanding of the story they have read and to give students an understanding of the structure of stories, so they become sensitive to top-level structure of stories and use it to improve their comprehension. Students are given questions related to the story that focus on understanding what happened in the story. Story structure questions help students improve their comprehension of a specific story and teach students a top-level structure that can help improve their ability to comprehend new stories with similar structure
Describe one or several Learning Objectives with which it could fit: Effective Studying promote reading comprehension; Develop functional writing skills; Learning Science concepts; Learning Technology concepts; Learning Engineering concepts; Learning Arts concepts; Learning Maths concepts

Table 9. – Resource 1 by Pixel

Resource Name: Tiago
Resource description <description can be done through a link>: https://pal-robotics.com/es/robots/tiago/
Sample of use in education with students with IDD <optional>: https://jrenoux.github.io/uploads/papers/interhai-2023-cei-jrx.pdf
Describe the difficulty or difficulties addressed: Problems initiating and maintaining conversations; Understanding social norms and rules; Delayed or unusual speech patterns; Expressing Feelings; Non-Verbal cues; Social communication and interaction with peers; (Note: These resource could be used with much many difficulties but with these are sample that fits with the activity)
Describe an activity in which it can be applied: Grocery Store Role Play. The robot and the student take turns being the "seller" and the "customer." The “customer” practices greeting the “salesperson,” asking a question about a product, and maintaining a brief conversation.
Describe one or several Learning Objectives with which it could fit: Improving Social Communication Skills; Social Interaction and Communication; Improving Attention

Table 10. – Resource 2 by Pixel

Resource Name: Project Based learning
Resource description <description can be done through a link>: https://www.pblworks.org/
Sample of use in education with students with IDD <optional>: https://www.j-humansciences.com/ojs/index.php/IJHS/article/view/4195
Describe the difficulty or difficulties addressed: Understanding social norms and rules; Non interactive play; Intense focus; Adherence to Rigid Routines; Repetitive behavior; Organization and planning; Time management; Organization, attention and rules; Cooperative Interaction; Cognitive Abilities; Social communication and interaction with peers; Problems organizing tasks; Do not follow through instructions.
Describe an activity in which it can be applied: Participation in a project resolution where a

sharing and cooperating situation is necessary, such as researching, preparing the outcomes, presenting them, etc.

Describe one or several Learning Objectives with which it could fit:

Effective Studying promote reading comprehension; Develop functional writing skills; Learning Science concepts; Learning Technology concepts; Learning Engineering concepts; Learning Arts concepts; Learning Maths concepts