Page to add as a tab ‘younger users’ in Education and Outreach similar to older users -work in progress-

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YOUNGER USERS -CHILDREN

Introductory questions

Some international considerations:

- **Research** on younger user’s needs with disabilities is very scarce (possible reason: less homogeneous group compared to older users?)

For younger people, the EU focuses on **skills**: YSKILLS (EU) (focus group 12-22 years last research on mental health)
[Note: skills- based approach new model? (seems to integrate the needs but is it sufficient?]

- **Definition of the child** the definition of the child varies on the context / country relevant legislations (depends on age [legal field: minor], developmental age, competencies, neurological development).

Overlapping needs (adults)

WCAG mention in Unicef documents: Accessible and inclusive solutions for girls with disabilities (Unicef, 2022 p.13).
Selection of success criteria that work for adults and children.

[Note: For children it is very important to mention guidelines in mainstream contexts (for all) and not for a specific group of children with disabilities as disabilities are not always visible or recognizable at a young age]

Specific needs

functional needs (and skills?)

Age Categories	Typical Chronological Range	Characteristics / Functional Needs
For Online Safety		
For Online Privacy		
For Developing Dexterity		
For Developing Literacy		

Age Categories	Typical Chronological Range	Characteristics / Functional Needs
Etc		

FAQ: functional needs evolve, more common to have combined functional needs vs adults, social considerations, lower awareness, balance independence-safety.

Statistics?

Prevalence

Later recognition

List of accessibility **indicators** for children based on their needs and the development of their digital accessibility literacy
1. Social considerations
2. Balance Safety-agency (in all environments)
3. Impact on children (statistical relevance, scalability …)
4. Awareness assessement (what does the child need to know, how, why)
5. Assistive technology: knowledge present, learning readiness or staged capacity building
6. Complex/ instersectional / evolving needs
7. Transposable (in different contexts)

Suggestions for children based on Functional needs for children see Notes

Generic	**Vision**	**Mobility**	**Speech**	**Cognitive attention**	**Learning disabilities**
Use without psychological harm	Use with Cortical Visual Impairment (CVI)	Use with limited dexterity but large potential to increase dexterity	Use with evolving / increasing ability to focus direct or shift (after treatment, support) confidence curve	Use with evolving / increasing ability to focus direct or shift (after treatment, support) confidence curve	Use with shame-aversion (acquired learning disability) or at risk of shame aversion
Use during diagnosis process	Use with limited competence in interpretation of visual stimuli	Use with physical sensory intersections	Use without clear pronunciation		

Use without feeling inadequate	Use with sensory intersections or conflicts	Inner ear problems and dizziness, balance issues Middle ear infections (otitis media)	Use with different accents		
Use without feeling different in a negative way (attitudes toward AT/Braille) Use in different settings Differences between home and school		Use with a sensory disability and maturing average fine motor control			
Use without public display		Handedness (left/right hand)			
Use without chronic unnatural or artificial confusion					
Users are given support if the technology reveals insights about the user (AI)					

Pedagogic intent: starting from the attributes of a learner seeing how content meets the learning needs.

Could be interesting to check what is more prevalent, check universal ‘pain points’.

Personnalisation / customization, add free ‘safe zone’ for learning

CLIPPS (Customized Learning Interface Production from Pedagogic Semantics) project assets to GitHub, including information on the pedagogic intent ontology

https://bob-dlc.github.io/clipps/ontology/ontology.html

Advocacy & educating

[categories for older users :Business case? Tips?]

Mention W3C/ UDL guidelines in AI frameworks, glossaries

Move away from medical model (still very much in use worldwide) and insist on **functional needs**:

- Younger children and transitioning
- Lower resource environments / Intersectionality/ complex needs
- Key contexts:

protection physical and mental,
development and learning,
organization & decision making,
social skills & inclusion,

Functional needs and **support (cases-pilot)**

Scalable initiatives worldwide Accessible digital learning

Guidelines and resources for children (mainstream)

Protection / safety/ Design/ UDL	Artificial Intelligence	Legal
ITU Child protection online	Artificial Intelligence and the Future of Teaching and Learning	Children's code California Age-Appropriate Design Code Act, A.B. 2273 (CAADCA)
Better Internet for Kids (vulnerabilities of children with disabilities and safeguarding)		
Skills & Knowledge on Assistive Technology in Early childhood inclusive		

education (for teachers)		

Standards referring to accessibility for children

IEEE Age Appropriate Design for Children's Digital Services

CEN CENELEC Workshop on 'Age Appropriate Digital Services Framework'

-Add link to the published document with contribution of CG on accessibility for children when ready-

Latest research related to accessibility for Children 2022- 2023

Title and link	Quote	Year	Comments
Accessibility of educational virtual reality for **children** during the COVID-19 pandemic	"The issues of accessibility to educational VR that this study identifies are twofold. On the one hand, parents and legal guardians are at loss trying to find educational VR applications and are unable to find contextualized content. On the other hand, numerous women refrain from engaging with VR, due to a range of physical discomforts and other concerns. These accessibility issues need to be addressed in order for VR to meet its potential as an innovative learning tool for all children."	2022	VR, education
Building Equitable Access and Inclusion for Children Growing up in the Digital Age	"Key points: The content and context media exposure are directly associated with social and cognitive outcomes during early childhood. Content designed for young children includes several positive child-centered features, as well as several negative exploitative features.	2022	Recommendations

	Context of media exposure can facilitate social interaction via joint engagement or disrupt interaction via “technoference”—disruption to relationships due to media. Equitable access to broadband would allow young children to reach academic goals and to be able to stay socially connected to distant family members. Policy needs to regulate Internet safety for young children and to reduce exploitative practices such in-app purchases and use of personal information for direct marketing. Policy changes needs to fund media literacy curricula for children, parents, and childcare providers to empower families to harness technology's potential.		
Inclusion of children with disabilities in qualitative health research: A scoping review	“A total of 62 studies met inclusion criteria. Rationales for including children with disabilities included child-focused, medical model of disability, and disability rights rationales. Participation of children with disabilities in qualitative health research was limited, with the majority of studies conducting research on rather than in partnership with or by children. Findings emphasize that children with disabilities are not participating in the design and implementation of health research.” “Further effort should be made by health researchers to incorporate children with a broad range of impairments drawing on theory and methodology from disability and childhood studies and collaborating with people who have expertise in these areas. Furthermore, an array of multi-method inclusive, accessible, adaptable, and non-ableist methods should be available to enable different ways of	2022	Efforts needed for Art. 12 (UNCRC) in research

	expression.”		
Customizing and Evaluating Accessible Multisensory Music Experiences with Pre-Verbal Children—A Case Study on the Perception of Musical Haptics Using Participatory Design with Proxies	"Our findings shed light on methodological and design considerations that should be taken into account when developing multisensory experiences informed by pre-verbal children."	2022	Haptics, music, pre-verbal children
Global leadership is needed to optimize early childhood development for children with disabilities	"Components of early childhood development such as good health, early learning and responsive care, as well as nutrition and growth, recorded increased funding between 6.5% and 24.5% during this period, whereas disability-specific funding declined by 11.4% (ref. [5])."	2023	Funding, early childhood
Speech/Language Impairment or Specific Learning Disability? Examining the Usage of Educational Categories	“the findings of this study reveal a terminological shift from S/LI to SLD that occurs around the age of 9 years”	2022	Diagnosis shifts language impairment to learning disability
What We are Learning from Research Using NAEP Mathematics Response Process Data	“The findings from this study, recently published in *Autism*, is an example of the power of process data to shed new light on learners with disabilities. Focusing on autistic students, Xin Wei and her team analyzed data from 15 items on the NAEP math assessment, their response time in seconds, their score on the items (including partially correct scoring), and survey data related to their	2023	

	enjoyment, interest, and persistence in math." "Researchers concluded that the linguistic complexity could be one of the reasons that autistic students struggle with math word problems; however, there were two word problems with which they seemed to struggle despite the fact that they were not linguistically complex. It turns out that the items were rated as having substantial social context complexity. The researchers also looked at the student survey data on what types of math they enjoyed more and found they had more enjoyment working with shapes and figures and less enjoyment for solving equations. The researchers recommend incorporating meta-cognitive and explicit schema instruction during mathematics instruction to aid autistic students in understanding real-life math word problems. They also recommend that assessment developers consider simplifying the language and social context of math word problems to make the assessment more equitable, fair, and accessible for autistic students. Because the autistic student population is particularly heterogenous, more research is required to better understand how to improve instructional strategies for them."		
Growing resilience capacity for learners presenting with specific learning disability in learners with special education needs schools	"Specific learning disabilities (SLDs) result from biological and contextual factors. The Diagnostic and Statistical Manual, 5th Edition (DSM-5) (2013) defines SLD as one of the neurodevelopmental disorders that originate from biology and comprise the interaction of genetics and contextual factors. The interaction between these factors affects the ability of the	2023	Definitions of learning disabilities and South African perspective.

	individual to process information adequately. Specific learning disabilities include disabilities in basic education skills like reading, listening, speaking, written expression or mathematical calculations (Grigorenko et al. 2020). “ “The study's results show that the combination of individual attributes, relational and environmental factors enables the resilience of learners with SLD. When given accessible and meaningful support, learners with SLD can develop resilience”		