

I.09. Teachers Attitudes, behaviors and sense of self-efficacy towards Artificial Intelligence

Using Artificial Intelligence to Boost Autonomy in a More Inclusive Society: The AMBRA Approach

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Augmentative and Alternative Communication (AAC) techniques are designed to support individuals with communication disabilities, enabling them to effectively convey their thoughts, needs, and emotions [1]. These methods are especially used to consolidate the autonomy levels of the individuals, for example, teaching them how to behave in every context. However, to be effective, AAC requires a personalized approach based on the cognitive level of the individuals. For example, individuals can understand symbols differently, demanding a huge effort from educators, caregivers, and speech-language professionals to create the material.

To create a personalized learning environment in AAC, we propose to use foundation models [2]. Foundation models are large pre-trained machine learning models that can generate complex texts or images. When fine-tuned for AAC, they offer educators efficient tools to craft personalized learning materials, making them indispensable for supporting autonomy. Indeed, they can create material that is tailored to the specific cognitive level, use AI-based methods to obtain suggestions for personalized content and create additional material that follows the progress of the individuals, making their learning path as smooth as possible.

Our approach is called AMBRA (Pervasive and Personalized Augmentative and Alternative Communication based on Federated Learning and Generative AI) [3]. AMBRA leverages a cloud-based system to create a shared space for the learning material that each educator can further customize. AI-based methods can also help create suggestions based on previous experience. This material can be accessed from modern devices (e.g., smartphones, tablets, laptops, etc.) in every context.

While this approach has great potential, it also opens several challenges to be discussed with the community. Our approach is built on top of free solutions, lowering the barriers and the costs to access AAC methods. Educators may exchange material more easily, creating a virtuous cycle that can boost the adoption of AAC methods. Also, low deployment costs allow shops, public places, and community places to adopt such solutions and allow for a seamless transition between school and society, creating a more inclusive environment around the individuals. For example, QR codes allow users to download specific material, which is later personalized based on specific user's information and symbols. It will become the perfect application of the autonomy concepts that have been acquired in class. An approach based on fine-tuned foundation models demands a combination of skills that are hard to find in modern educators. AMBRA advocates the creation of interdisciplinary environments where, for example, pedagogical and linguistic skills are combined with ICT skills. Finally, the use of personalized material and its flexible creation allows educators to approach sensitive topics (e.g., sexuality) in a way that is appropriate for everyone. Also, it can lower the cultural and language barriers when used with immigrants, facilitating their integration into a new community.

In conclusion, we believe that using artificial intelligence and generative AI opens the possibility of creating new learning paths that can empower all students to obtain complete autonomy and make society more inclusive.