



'WHAT DOES ACCESS TO AAC FOR IRISH MEAN TO YOU?'

GEABAIRE, THE FIRST SYMBOLS-BASED AAC APPLICATION FOR THE IRISH LANGUAGE: PRELIMINARY FINDINGS FROM AN EVALUATION STUDY

Geabaire is the first symbols-based AAC app for the Irish language. Users select a series of words that are concatenated into a sentence and spoken by ABAIR synthetic voices. **Geabaire** has been designed to reflect the linguistic structures of Irish and contains a broad, localised vocabulary that empowers those who cannot rely on speech to communicate their thoughts and needs and engage with the curricula, their family, community, and peers. The target users are autistic students in Irish medium education, but it is hoped that **Geabaire** will benefit a broader range of users. This paper discusses the design and development of **Geabaire** and preliminary findings from semi-structured interviews with teachers, parents, speech and language therapists, and an AAC user. It focuses on participants' reflections on what AAC for Irish means to them. Findings indicate that AAC for Irish is necessary to facilitate equal access to linguistic and cultural identity and allow users to participate in their communicative environments.

Keywords: Augmentative and Alternative Communication (AAC), Irish, inclusion, Autism, language rights.

JULIA CUMMINS is a PhD student at ABAIR, Phonetics and Speech Laboratory, Trinity College Dublin. **EMILY BARNES** is Assistant Professor in Language Education at Trinity College Dublin. **NEASA NÍ CHIARÁIN** is Ussher Assistant Professor in Irish Speech and Language Technology at Trinity College Dublin. **AILBHE NÍ CHASAIDE** is Adjunct Professor, Centre for Language and Communication Studies (CLCS) at Trinity College Dublin.

Corresponding author: jcummin@tcd.ie

INTRODUCTION

Irrespective of their abilities, all children should have equal access to their linguistic and cultural identity as a fundamental human right (United Nations, 2006). However, this is often not the case for autistic children in the Irish context. Minimally speaking, autistic children tend to attend either special schools or autism classes, where students in the English medium context are entitled to an automatic exemption from the study of Irish (Department of Education, 2022). Language ability and use are diverse among autistic people. Statistics suggest that 25-30% of autistic children are minimally speaking, although many can understand more than one language (Rose et al., 2016; Digard et al., 2022). Despite evidence to the contrary, there is a lingering misconception among some professionals that learning Irish would be burdensome for autistic students, particularly those with complex communication needs, leading to parents seeking Irish exemptions on behalf of their children or avoiding Irish medium (IM) schools (Nic Aindriú, 2022). However, international research indicates that this avoidance of exposing autistic children to second languages tends to be based on personal belief rather than research (Yu, 2013). Research has consistently shown that bilingualism does not negatively affect the language development or cognitive skills of autistic children and that it can also enhance their social skills and enable autistic individuals to connect with their identity, family, and communities (Romero and Uddin, 2021; Digard et al., 2022). Our collective responsibility is to ensure that autistic people have equal access to language learning and the necessary support to enable this (Digard et al., 2022).

Fortunately, attitudes towards bilingualism are changing, and autistic students now make up a significant proportion of those accessing IM education. Autism was reported as the second most common additional need in IM schools (Nic Aindriú, Ó Duibhir and Travers, 2020). Over the last ten years, there has been a corresponding growth in autism classes in IM settings and Gaeltacht schools (NCSEI, 2024). Many of the students in these classes could benefit from access to Augmentative and Alternative Communication (AAC) (Iacano, 2016). Culturally and linguistically relevant AAC is not just desirable but a pressing necessity for these students and AAC-using Irish speakers in general. It is crucial for these students to participate fully in their communicative environments (Soto and Yu, 2014).

GEABAIRE, ABAIR AND THE DEVELOPMENT OF AAC FOR IRISH

AAC refers to tools and strategies that can enhance speech or provide an alternative means of communication for those who cannot rely on speech alone to communicate (American Speech-Language-Hearing Association [ASHA], n.d.). Examples of AAC tools and strategies are gestures, Lámh, using picture cards, and writing notes (Buekleman and Light, 2020). **Geabaire**, the AAC system described in this paper, is being developed in Trinity College Dublin at the Phonetics and Speech Laboratory, within the ABAIR research group. It is an AAC app accessed on a tablet that allows the user to select a series of words and images to compose a sentence, which is then read out by an ABAIR synthetic voice in Irish. The voices are developed by the ABAIR project, which is an initiative developing linguistic resources, speech technology, and applications for the dialects of Irish.

Geabaire allows users to spontaneously generate words, phrases, or sentences in Irish, enabling them to communicate their thoughts and needs and engage with the curriculum, their family, community, and peers. The system architecture and guiding principles of **Geabaire** are designed to be simple and intuitive, with a deep understanding of the features and structure of the Irish language underpinning the design (Barnes et al., 2022). The layout minimises the number of keystrokes by making the core words, i.e., the most frequently used words, available with fewer hits than fringe words, i.e., less frequently used words such as nouns. Grid arrangement and icon location are consistent across the boards. These elements promote predictability in the motor plan, which research indicates facilitates automaticity, thus reducing the user's cognitive and motor load (Dukhovny and Gahl, 2014).

Geabaire contains a broad, localised vocabulary relevant to school curricula. The design aims to facilitate communication and be simple to use and learn. The home board layout is in a grid format, providing efficient access to Irish's core words. Subsequent boards can be accessed via the home board with tabs that provide efficient access to, *RÉAMFHOCAIL* 'prepositional pronouns', *GOB GASTA* 'quick- gab', which includes high-frequency phrases, e.g., *go raibh maith agat* 'thank-you' and *STAD* 'stop' which contains self-advocacy phrases such as *tá sos uaim* 'I need a break' among many more functions. **Geabaire** is currently in the beta testing stage with limited users. The full release is pending the development of a grammar checker that will automatically implement morphophonology such as the initial mutations *séimhiú* and *urú*, for example, the synthesis of children's voices, the development of a bilingual Irish/English system to allow for code-switching, and crucially the ability to use **Geabaire** offline.

METHODOLOGY

The Research Ethics Committee of the School of Linguistic, Speech and Communication Sciences gave ethical approval for the research project described below. Participants in this study included the parents, speech and Language Therapists (SLTs), and teachers of seven autistic children attending IM schools outside of the Gaeltacht who were invited to trial **Geabaire**. The sampling method used was purposive sampling through existing contacts with snowball sampling, where existing participants suggested other participants. All of the children are autistic and minimally speaking. Two of the seven children are in mainstream settings, while the remaining five attend autism classes. Three children have Irish and English at home (one fluent Irish-speaking parent and one English-speaking parent). Three have only English at home, and one has only Irish at home. To obtain a complete picture, we attempted to interview each child's teacher, SLT, and parent, but this was not possible in every case. The participants comprised the following teachers (n=3), SLTs (n=3), and parents (n=6). Note that the study had one pair of siblings who shared parents and SLTs. In addition, an advisory panel of two SLTs/academics and an adult AAC User were interviewed (n=3). A total of 15 interviews have been conducted to date.

Prior to the study, participants were invited to view a training video explaining the study, the features of **Geabaire**, and some additional instructions on how to use the app. The AAC user, teachers, and parents were asked to use **Geabaire** to communicate or to model as a communication partner with an AAC user in various settings and scenarios during daily routines for ten minutes over ten sessions. Those who were neither AAC users nor communication partners, i.e., academics and SLTs, were invited to assess the system using their clinical judgment. Participants were provided with a list of sample sentences that represent various functions of communication as well as sample core and fringe words to act as a starting point. They were invited to explore **Geabaire** in its entirety however they wished. After four weeks of using the app, they participated in a 45-minute semi-structured interview where they were asked about their experience using **Geabaire** and invited to make recommendations for future adaptations. Thematic analysis (Clarke and Braun, 2017) was used to analyse the data generated through the interviews. The present paper analyses only the first question: 'What does AAC for Irish mean to you?'

FINDINGS

Themes were coded and recorded according to the interview question, with a high rate of intra-rater reliability. Themes were then combined to form four overarching themes among the four groups: AAC user, teachers, SLTs, and parents. While there was some commonality in responses among the groups, some themes emerged more strongly in certain groups. When viewing this study's findings, the main limitations are (i) the small sample size and (ii) only one AAC user was interviewed. The themes that emerged are as follows:

- Facilitation of Inclusion and Participation
- Tools and Resources for Irish Medium Schools
- Family/Community/Identity
- Language Rights

Facilitation of inclusion and participation

When describing what AAC for Irish meant to them, the AAC user indicated that participating in local 'Pop-Up-Gaeltacht' events would be possible for them with an AAC that supported Irish. They also pointed to the possibility of engaging more actively in language learning. AAC for Irish would enable them to practice conversing in Irish; they would have a way of 'speaking' the language. They added that with AAC for Irish, they could communicate and use the language should they visit the Gaeltacht areas.

The parents, in particular, emphasised the social opportunities that would come with access to AAC for Irish, with one parent noting that AAC for Irish would bring opportunities for their child to mix socially in the context of an IM school, "So if he wants to speak Irish with the rest of them, he can do that" (Parent 2). Another parent highlighted the significance of AAC in facilitating participation in the mainstream class if the child chose to do so, saying that "if he wants to integrate into the mainstream class, he needs to be able to communicate in Irish, ... it is seriously important to us" (Parent 3).

When asked what AAC for Irish meant to them, one SLT opened her comments with the words "Inclusivity and opportunity," going on to state that;

"... if you work in the disability field, you are worried about including people, and then, of course, if some of those people come from families that value Gaeilge 'Irish' or are in a school where Irish is spoken, then there has to be a means for them to participate with AAC that's as Gaeilge 'in Irish'" (SLT 2).

Another SLT said that it meant that users of AAC for Irish would have the "ability to be part of the community" (SLT 1). SLT 5 noted that more autism classes were opening in IM schools and that while the need for AAC for Irish may not have been pertinent in the past, it is now. They emphasised the importance of facilitating access: "Making sure that the kids that need robust communication access have that no matter what kind of language medium school they have access to" (SLT 5).

They also touched on the idea of 'buy-in' for AAC from Irish medium schools, referring to "Irish-speaking schools who are maybe slightly more reluctant to have English-speaking devices in there constantly as well" (SLT 5).

This need for an Irish language AAC app to get buy-in for AAC use in the classroom was a theme also prevalent among the parent group in the study. The question of whether or not their AAC-using child would be permitted to use their English-language AAC in an IM school, particularly during the first two years of schooling before English was spoken, was such a concern for one parent that it was the first question that they asked the principal when enquiring about the school, "Because it is really important. It is his only way of accessing the curriculum. So, obviously, he communicates his thoughts and wants and so on. So, to have Irish is massive..." (Parent 3).

Tools and Resources in an Irish Immersion Setting

AAC for Irish as an additional, necessary tool or resource was a recurring theme among the teachers. Teacher 1 said AAC for Irish "was another tool for total communication." Going on to say, "The more resources we have as Gaeilge 'in Irish,' the better it has been for the Gaelscoil (IM school). So, it is a very valuable tool for use, even for others in the class, not just the people that need AAC." Teacher 2 described **Geabaire** as a "tool to communicate and just to facilitate the boy in my class who needs it." going on to say, "It just opens up a whole new form of communication for me in my classroom. It is really essential, and we need it; we really, really need it".

Teacher 2 also takes a total communication approach, i.e., creating an environment where a variety of means of communication, e.g. AAC, gestures, Lámh keyword signing, etc., are used to be understood, describing **Geabaire** as a

"way to communicate along with Lámh and along with all of our visuals, it is something extra, an added resource" (Teacher 2).

Teacher 3 described Geabaire as a part of a suite of communication tools, saying,

"It is really positive, and it has enabled us to do a much wider scope of things in the classroom now that we have access to a broader range of communication devices and methods for the children who have different communication methods themselves" (Teacher 3).

Family, community, and identity

The study includes one family where Irish is spoken exclusively at home and two families where Irish is spoken alongside English with one L1 parent. AAC for Irish has meaning beyond school life and curriculum access for these families. It has a more fundamental meaning as it connects the parent and user with family, community, and identity. In one family where Irish is the home language, the mother said, *"I hope as his Mom that I love Irish, so it is really important to me and for this identity and for his identity as part of the family that he is able to communicate ..."* (Parent 1).

To the AAC User, access to AAC for Irish meant it would be possible to *"actively participate in passing on the language to children [they] may have and to [their] nieces and nephew"*. One SLT spoke about how *"fundamental [AAC for Irish] is from an identity point of view"* (SLT 1). A parent spoke about how AAC for Irish means her child can communicate most appropriately for him, stating that *"sometimes Irish is better."* She said, *"Sometimes he will know the Irish word for something, and sometimes he will know the English word for something. But it is up to him to have the choice; that is so cool"* (Parent 1). A father spoke about how powerful it would be for him to hear the word 'Daidí' in the vocative case with the grammatically required séimhiú included, i.e., 'a Dhaidí' (Parent 4).

Language rights

Among the strongest themes that came through was that of language rights. One SLT described access to AAC for Irish as a 'human right' and pointed to the statutory rights afforded to people with speech-related disabilities to enable them to access education, public services, speech and language therapy, etc., through Irish¹ (SLT 2). A teacher stated that children had a right to the language. As Irish is the primary form of communication, instruction was through Irish in their IM school (Teacher 3).

The parents were particularly strong on this, with one parent saying that there is a tendency to view Irish as a privilege reserved for the middle class and a cultural marker rather than a rights issue, going on to say they felt strongly that *"any service that's available to the English speaker should be available to the Irish speaker"* (Parent 4). Another parent said that access to AAC was "vital" because she is bringing her children up with English and Irish so that her son, who is nonspeaking, *"...gets the same access to be able to communicate and advocate for himself in whatever language is appropriate"* (Parent 1). Another parent said that access to Irish was *"An equality piece"* (Parent 2). Finally, a parent stated that AAC for Irish meant that their child *"has absolutely every chance of becoming bilingual as much as any of the other kids"* (Parent 3).

DISCUSSION AND CONCLUSION

The findings clearly show that AAC for Irish is essential and meaningful to the participants, and that there is a significant need for the resource among the group. It is also clear that the lack of access to AAC for Irish has been a significant barrier to inclusion and participation both at home and at school. The absence of AAC for Irish effectively excludes those who need AAC to communicate from meaningful participation in Irish language learning and, in doing so, denies them access to a core element of their cultural and linguistic heritage as well as all of the well-documented benefits of IM education (Cummins, 1998; Dunne, 2024). Access to AAC for Irish may be a factor for parents deciding whether or not to send AAC-using children to IM schools. There is a question over whether or not English-language AAC systems, are permitted, especially during the first years of schooling characterised by full Irish immersion. There is also a suggestion that a lack of access to AAC in IM settings is a barrier to autistic students integrating with their peers in the mainstream class in a meaningful way.

1 The Education Act 1998 highlights the importance of inclusivity and equal access, ensuring accommodations for disabled students or those with additional learning needs while also affirming parents' rights to choose a school for their children, including IM schools (Government of Ireland, 1998). The Education for People with Special Education Needs EPSEN Act 2004 outlines the right of students with disabilities to access appropriate education tailored to their needs (Government of Ireland, 2004). Article 8 of the Irish Constitution recognises Irish as the first official language of Ireland meaning that public services should be available to all through Irish (Bunreacht na hÉireann, 1937 Article 8). The Policy on Gaeltacht Education 2017-2022, supports the availability of educational services, including speech and language supports, through Irish for children in Gaeltacht areas. (Department of Education and Skills, 2016).

The importance of the availability of tools and resources in IM and Gaeltacht schools is well documented. The situation is improving, but IM schools need access to the same tools and resources available to English-medium schools to enable them to teach children with additional learning needs (Nic Aindriú and Ó Duibhir, 2022). The advances in speech and language technologies for the Irish language, as documented in the Digital Plan for the Irish Language, are encouraging (Government of Ireland, 2023). Interestingly, all of the teachers who have responded so far see AAC for Irish as being a tool or resource in a total communication approach for multi-modal communication, i.e., using a variety of modalities, e.g., Lámh, visual schedules, and AAC to communicate and to develop language and communication skills. Communication as a multimodal process for many with speech-related disabilities is well-supported by research (Beukelman and Light, 2020). Where Irish is the language of the home, there is an even greater urgency to provide AAC for Irish. Using a sociocultural perspective on bilingualism and AAC, Soto and Yu (2014) contend that language use significantly impacts children's social development since language develops through involvement and mediates participation in sociocultural activities. The findings show that participants view Geabaire as a means to facilitate the right to equal access to Irish for AAC users and this is congruent to a greater desire for full inclusion and participation in Irish society in general, whether that be from the point of view of access to inclusive education or full participation in family, community and cultural life.

REFERENCES

- American Speech-Language-Hearing Association. (n.d.). *Augmentative and Alternative Communication* [Practice portal]. <https://www.asha.org/practice-portal/professionalissues/augmentative-and-alternative-communication/> (accessed July 2, 2024)
- Barnes, E., Morrin, O., Ní Chasaide, A., Cummins, J., Berthelsen, H., Murphy, A., Nic Corcráin, M., O' Neill, C., Gobl, C and Ní Chiaráin, N. (2022). AAC don Ghaeilge: the Prototype Development of Speech-Generating Assistive Technology for Irish. *Proceedings of the CLTW 4 @ LREC2022*, pp. 127–132.
- Barnes, E., Cummins, J., Errity, R., Morrin, O., Berthelsen, H., Wendler, C., Murphy, A., Husca, H., Ní Chiaráin, N. and Ní Chasaide, A. (2023). Geabaire, the First Irish AAC System: Voice as a Vehicle for Change. *Trinity's Access to Research Output (TARA) (Trinity College Dublin)*. doi:<https://doi.org/10.21437/sigul.2023-28>.
- Beukelman, D., Light, J. (2020). *Augmentative & Alternative Communication; Supporting Children and Adults With Complex Communication Needs*. Baltimore: Brookes Publishing Co.
- Bunreacht na hÉireann*. (1937). Dublin: Stationery Office. Available at: <https://www.irishstatutebook.ie/eli/cons/en/html> (accessed:10/12/2024).
- Clarke, V., Braun, V. (2017). Thematic Analysis. *The Journal of Positive Psychology*, 12(3), 297-298. <https://doi.org/10.1080/17439760.2016.1262613>
- Cummins, J. (1998). 'Immersion education for the millennium: What have we learned from 30 years of research on second language immersion?' In: M. R. Childs & R. M. Bostwick (Eds.) *Learning Through Two Languages: Research and Practice*, Second Katoh Gakuen International Symposium on Immersion and Bilingual Education. (pp. 34-47). Katoh Gakuen, Japan.
- Department of Education and Skills. (2016). *The Policy on Gaeltacht Education 2017-2022* <https://www.gov.ie/en/policy-information/57458-policy-on-gaeltacht-education-2017-2022/> (accessed 27 July 2024).
- Digard, B. G., Davis, R. (2021) *Bilingualism in Autism: Evidence and Recommendations for Clinical Practice*: OSF Preprints. <https://doi.org/10.31219/osf.io/uyzkg> (accessed 28/01/2025)
- Digard, B.G., Davis, R., Stanfield, A., Sorace, A. and Fletcher-Watson, S. (2022). 'The Languages That You Know Draw the Boundary of Your World': A Thematic Analysis of the Experiences of Autistic Bilingual Adults Living in the United Kingdom. *Autism in Adulthood*, 4(4), 328–339. doi:<https://doi.org/10.1089/aut.2021.0077>.
- Dukhovny, E. and Gahl, S. (2014). Manual Motor-Plan Similarity Affects Lexical Recall on a Speech-generating Device: Implications for AAC Users. *Journal of Communication Disorders*, 48, 52–60. doi:<https://doi.org/10.1016/j.jcomdis.2014.02.004>.
- Dunne, C. M. (2024). *Irish Medium Education: the Benefits Supported by Research*. COGG. https://www.cogg.ie/wp-content/uploads/Irish-Medium-Education-The-Benefits-Supported-by-Research-PRINT-HR-singles_Part1.pdf (accessed 28/01/2025)

- Government of Ireland. *Government of Ireland Act* (1998) Dublin: Stationery Office. Available at: <https://www.irishstatutebook.ie/eli/1998/act/51/enacted/en/html> (accessed 27 July 2024).
- Government of Ireland. *The Education for Persons with Special Educational Needs (EPSEN) Act* (2004) Dublin: Government Publications. Available at: <https://www.irishstatutebook.ie/eli/2004/act/30/enacted/en/htm> (accessed 27 July 2024).
- Government of Ireland. Circular 0054/2022, *Exemptions from the Study of Irish – Primary* (2022). Dublin: Stationery Office Available at: <https://www.gov.ie/en/circular/28b2b-exemptions-from-the-study-of-irish-primary/> (accessed 27 July 2024).
- Government of Ireland. (2023). *Digital Plan for the Irish Language: Speech and Language Technologies, 2023-2027*. Dublin, Ireland.
- Iacono, T., Trembath, D. and Erickson, S., 2016. The role of augmentative and alternative communication for children with autism: current status and future trends. *Neuropsychiatric Disease and Treatment*, 2349-2361.
- National Council for Special Education Ireland (NCSEI). (2024). *Special Classes in Primary and Post Primary Schools Academic Year 24/25*. Available at: https://ncse.ie/wp-content/uploads/2024/08/Special_Classes_publication_list_01-08-24-.pdf (accessed 3 August 2024).
- Nic Aindriú, S., Ó Duibhir, P., and Travers, J. (2020). The Prevalence and Types of Special Educational Needs in Irish Immersion Primary Schools in the Republic of Ireland. *European Journal of Special Needs Education*, 35(5), 603-619. <https://doi.org/10.1080/08856257.2020.1732109>
- Nic Aindriú, S. (2021). The Reasons Why Parents Choose to Transfer Students With Special Educational Needs from Irish Immersion Education. *Language and Education*, 1–15. doi:<https://doi.org/10.1080/09500782.2021.1918707>.
- Nic Aindriú, S. and Ó Duibhir, P. (2022). *Analysis of Current Teaching and Learning Resources for Children with Additional Educational Needs in Irish Medium and Gaeltacht Education*. Available at: https://gaeloideachas.ie/wp-content/uploads/2022/06/GD_Executive_Summary_English_Digital.pdf (accessed 30 July 2024)
- Nic Aindriú, S. and Ó Duibhir, P. (2023). The Challenges Facing Irish-Medium Primary and Post-Primary Schools When Implementing a Whole-School Approach to Meeting the Additional Education Needs of Their Students. *Education Sciences*, [online] 13(7), 671. doi:<https://doi.org/10.3390/educsci13070671>.
- Nic Aindriú, S. (2024). Equality of access to minority language assessments and interventions in immersion education. *Journal of Immersion and Content-Based Language Education*. doi:<https://doi.org/10.1075/jicb.24011>.
- Romero, C. and Uddin, L.Q. (2021). Bilingualism, Executive Function, and the Brain: Implications for Autism. *Neurobiology of Language*, 2(4), pp.1–51. doi:https://doi.org/10.1162/nol_a_00057.
- Rose, V., Trembath, D., Keen, D. and Paynter, J. (2016). The Proportion of Minimally Verbal Children with Autism Spectrum Disorder in a Community-Based Early Intervention Programme. *Journal of Intellectual Disability Research*, [online] 60(5), 464–477. doi:<https://doi.org/10.1111/jir.12284>.
- Soto, G. and Yu, B. (2014). 'Considerations for the Provision of Services to Bilingual Children Who Use Augmentative and Alternative Communication', *Augmentative and Alternative Communication*, 30(1), 83–92. doi: 10.3109/07434618.2013.878751
- United Nations. (2006). *Convention on the Rights of Persons with Disabilities*. Treaty Series, 2515, 3.
- Yu, B. (2013). Issues in Bilingualism and Heritage Language Maintenance: Perspectives of Minority-Language Mothers of Children with Autism Spectrum Disorders. *American Journal of Speech-Language Pathology*, 22(1), 10–24. doi:[https://doi.org/10.1044/1058-0360\(2012/10-0078\)](https://doi.org/10.1044/1058-0360(2012/10-0078)).