Developing augmentative systems to assist both Irish L1 users and L2 learners

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“Developing augmentative systems to assist both Irish L1 users and L2 learners”

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Introduction

There has been substantial and significant research and development of augmentative and alternative communication (AAC) systems and devices in recent years. The use of AAC technology to assist those with complex communication needs (CCN) can “encompass various modalities that can replace or augment a person’s speech and other existing communication skills”.¹ Ranging from unaided AAC systems (e.g. sign language, facial expressions) to aided based systems (e.g symbol boards, speech-generating devices) the use of such technology is included in the assessment and intervention process conducted by Speech and Language Therapists (SLT) and support teams.

Arising from the substantial growth and optimisation in this technology and as it becomes more readily available via applications for smartphones and tablets, the potential to support AAC users who wish to communicate in minority languages and languages other than English is very encouraging. Acknowledging the growth of Irish-medium education with over 53,000 students currently enrolled in Irish-medium schools,² alongside ongoing campaigns to promote the Irish


language and the areas in which it is most commonly spoken (Gaeltacht areas in West Kerry, Conamara in Co.Galway, Gaoth Dobhair in Co. Donegal), accessing aided AAC technology, in particular, has huge potential and could be seen as incredibly beneficial to those who wish to have a more equitable chance to engage in the language spoken in their home, their community or their school. At present, there is no aided AAC device or system that enables those who wish to communicate in Irish to accurately portray complex grammatical structures or novel culturally related phrases in Irish.

The period of not being able to attend school during the pandemic has been challenging for both students and educators from an education, communication, connection and relationship perspective. This research into Irish language-based AAC systems and devices offers insight into a practical way to increase accessibility to those learning Irish as an AAC user, an L2 language user or as a student in Irish-medium education. To conduct this research, a needs analysis survey was designed and shared amongst a diverse cohort of participants based on two main research questions:

**Research Question 1:** What are the grounds for which people are requesting Irish language AAC systems/speech-generating devices?

**Research Question 2:** What key features of AAC systems/speech-generating devices that are currently available would be useful to consider in designing a new Irish language AAC system/speech-generating device?

This paper will first give an insight into current research into AAC usage in Ireland and abroad, which will help to clarify the challenges and barriers that face future development and implementation of AAC systems and devices, with Irish and other minority languages included in the discussion. Following this, an explanation of the research methodology, survey design and
participant recruitment procedures will be provided. Key findings will then be presented aligned with the research questions above, with analysis accompanying figures to support the findings.

With the focus on bilingual AAC, minority languages and AAC development growing, optimising AAC technology for the Irish language offers inclusive and accessible ways to communicate for those with speech and language difficulties who are educated through both remote and hybrid access. This paper explores what key features are necessary for Irish AAC (bilingual, layout, high-tech or low-tech) and why such technology is in demand by those who need to communicate in Irish, as an L2 learner or as members of the Irish-speaking community.

**Literature Review**

**Impact of AAC in intervention and assessment**

Augmentative and alternative communication (AAC) is defined by the American Speech-Language-Hearing Association (ASHA) as clinical practice intervention method to assist those with complex communication needs (CCN) “characterized by impairments in speech-language production and/or comprehension, including spoken and written modes of communication”\(^3\). Figure A illustrates how this technology can be classified into three categories: no-tech, low/light tech and high-tech, which is matched accordingly to AAC users by SLTs and AAC intervention teams who can help to determine “the fit between a device or system and the communicative abilities and needs”\(^4\) of those who would be engaging with this method to increase communicative abilities.

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AAC is not a standalone intervention method used by SLTs and the wider support team, but is part of an overall behavioural package “support comprehension and learning within structured activities”.\textsuperscript{5} This can then be translated into real-world environments with support from communication partners to gain valuable comprehension and learning skills. By using AAC technology, there is an indication that AAC users can gain increased independence and autonomy with a ‘person-centred’ approach to the intervention process, have a deeper social role and solidify strong friendships, along with improving physical and mental health.\textsuperscript{6}

Positive associations can also be found between both aided and unaided AAC systems, showing a positive impact on vocabulary acquisition and symbol comprehension.\textsuperscript{7} Ganz (2015) also notes that such interventions not only can help treat communication deficits, but can support treatment for co-occurring diagnoses and challenging behaviours in certain cases where the AAC user would also have a diagnosis for autism/ASD.\textsuperscript{8}

**Key issues related to AAC usage in Ireland**

AAC users in Ireland experience similar intervention and assessments as their international counterparts. A recent position paper published by the Irish Association for Speech and Language Therapists (IASLT) note the benefits of including AAC intervention in

\textsuperscript{5} Iacono et al, 2016.

\textsuperscript{6} AssistiveWare. (2021). An introduction to Augmentative and Alternative Communication (AAC). What is AAC and who is it for? What are the different types of AAC? What are the benefits of AAC? Retrieved 20 May 2021 from https://www.assistiveware.com/learnaac/what-is-aac


assessments for those with CCN, acknowledging the “growing body of evidence to support the use of AAC”\textsuperscript{9} has seen the use of AAC incorporated into individual interventions and assisted in reducing barriers to communication. However, this position paper also notes the “lack of ongoing support for AAC users”\textsuperscript{10} as adults, indicating that support and resources for this cohort is quite limited. The importance of positive communication environments is highlighted, with support for dedicated training for communication partners.\textsuperscript{11}

One important aspect of the AAC intervention assessment model in Ireland of note is that this is mainly conducted through the medium of English, with many AAC systems both low-tech and high-tech being readily available through English, echoed in other societies where services “are often delivered only in the majority or socially dominant language”.\textsuperscript{12} Considering that the Irish language is constitutionally recognised as the first national language of the Republic of Ireland in Article 8 of the Constitution (Bunreacht na hÉireann) and the Official Languages (Amendment) Act 2021, it would be reasonable to assume that there is also prioritisation for the provision of resources and tools supporting a practical and an inclusive approach to promoting and accommodating all those who wish to speak Irish and live in Irish speaking communities, such as the Gaeltacht areas. While the legislation clearly provides a basis for this, the practicalities are not as straightforward and it can be challenging to engage in society and live through the medium of the Irish language, especially for minority groups including Irish speakers.

\textsuperscript{9} Irish Association of Speech and Language Therapists (IASLT) IASLT. (2019). Speech and language therapy service provision for adults with an intellectual disability and communication needs: Definition, Service Provision and Recommendations for Change.

\textsuperscript{10} Ibid

\textsuperscript{11} Ibid

Organizations including Gaeloideachas have been engaging in exceptional work in developing resources, in particular those classified as having special educational needs (SEN), such as a student with autism spectrum disorder (ASD) or dyslexia. It is often the case that in minority languages, it can fall upon the communication partners or SLTs who have fluent communication skills to translate, rearrange and edit existing tools\(^\text{13}\) to support language and cultural participation. Guidelines published by IALST in 2016 under the title ‘Working with Linguistically Diverse Service Users’ does acknowledge the increasingly diverse clientele they would be engaging with and that they should be assessed in each of their languages.

Further research conducted by Francesca La Morgia of Trinity College Dublin highlights that the employment of interpreters to assist the SLT may help them understand competence, but “cannot substitute a trained healthcare professional”\(^\text{14}\) citing the lack of tools and resources to carry out bilingual intervention being limited to the availability of interpreters or others taking it upon themselves to make the relevant AAC materials available in another language, such as Irish. As a result, children who experience fluent Irish in their home, community and education settings often access their assessment and treatment through the medium of English.\(^\text{15}\) The Census data from 2016\(^\text{16}\) notes over 22,221 pre-school children and 76,301 children with languages other than English or Irish at home, along with 50,000 pupils engaging in Irish-

\(^{13}\) Stone, B. C. (2019). Ko tōku reō tōku ohooho: towards culturally located te reo Māori augmentative and alternative communication.


\(^{15}\) La Morgia, 2018.

\(^{16}\) Census 2016 Summary Results (2016). Central Statistics Office
medium education. Such numbers suggest the investment in Irish-based assistive technology, such as AAC, would prove beneficial to many across the country.

**Influence of bilingualism in AAC research**

Work by researchers in South Africa, New Zealand, the United States of America (USA) and other countries focusing on languages such as Zulu, te reo Māori, Spanish and Arabic have seen interest pique from other nations, such as Ireland, who are looking to take inspiration from this work and apply it to their own context. The key point being made across the literature is that this is still a niche area of research, with recommendations looking at how the implication of bilingualism can be integrated into system design. Alongside this, ensuring that scaffolding language development preserves key cultural values and increasing adequately trained professionals to deliver such services.\(^{17}\)

Discussions have arisen in recent years regarding the importance of bilingual intervention for AAC users, particularly in the early intervention stage, with similar issues and barriers arising in different countries in providing these services. A case study undertaken by Stewart (2017)\(^{18}\) as part of their doctoral studies, where the participant who had Downs Syndrome came from a background where Spanish was the dominant home language and had therapy provided in Spanish was reported to “constitute an effective and culturally and linguistically appropriate intervention for this participant”\(^{19}\). With consideration for the Language Independence Hypothesis considering the transfer of language skills from L1 into L2, utilising core words that were “functional and culturally valued”\(^{20}\) and facilitating codeswitching along with

\(^{17}\) Soto & Yu, 2014  
\(^{19}\) Ibid  
\(^{20}\) Ibid
communication partners implementing indirect intervention in the target language, a strong case can be made for bilingual AAC assessment and interventions. The combination of these efforts would be better supported with a bilingual device that can facilitate codeswitching, differing grammatical structures, modalities and motor planning, which is echoed in work by Soto & Yu (2014) and in an exploratory study by Tönsing et al in South Africa (2019).21

**Research methodology**

**Survey design**

Due to the restrictive nature of the Covid-19 pandemic, the decision was made not to conduct any in-person consultation sessions due to the public health guidelines and restrictions that were put in place to protect everyone from the coronavirus. This research conducted via the needs analysis survey is noted as the primary scoping exercise to begin developing Irish AAC in the future.

The survey was hosted via an online survey software platform, Qualtrics, with every effort made to ensure that the software was made as accessible as possible. Different options were explored to find the best survey platform that would be easy to manage for a variability of users. Ensuring that the survey was accessible was the main priority in selecting the survey modality, based on discussions with the core advisory group; Qualtrics was chosen for this reason. A core advisory group advised on this matter. This core advisory group includes an adult AAC user, a parent of two children who use high-tech AAC systems in the form of an application on an iPad and members of the SLT profession. The researcher utilised the expertise

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of the core advisory group to ensure that the survey was accessible and appropriate for all stakeholders involved, while also availing of their assistance in the recruitment of participants for the survey. A self-directed survey that utilised both quantitative and qualitative questions offered significant scope to conduct a thorough mixed methods analysis that would offer a broad insight into the needs and demands of those hoping to use Irish AAC in the future.

The aim of the survey was to have participants complete their answers within a timeframe of 15 minutes, with three main sections to the survey:

**Section 1:** Background Information – understanding the profiles of the participants.

**Section 2:** Experience using AAC systems – understanding the different types of systems in use and the types of settings that the technology is utilised for.

**Section 3:** Irish language AAC needs analysis – understanding the reasons why participants would be in favour/not in favour of Irish AAC and the key features that they would like to see incorporated in future development of an Irish AAC system.

Participants were informed that their participation was entirely voluntary and that they could withdraw their consent at any point in time if they so wished. For the online based survey, informed consent was elicited at the beginning of the survey, by participants checking a box to indicate their consent and willingness to participate in the survey. The survey was confidential and did not ask for any identifying information from participants. Members of the core advisory group were provided with a direct link to the survey along with a Participant Information letter to circulate to those who may be interested in participating in the research. Potential participants were also recruited from dedicated AAC Facebook groups (e.g. AAC Users and Allies Ireland) along with a radio campaign on national Irish radio.

**Assumptions ahead of analysis**
Considering the aim of the survey is to determine what the interest is for the development of Irish language based AAC, there would be an assumption of some level of demand for this technology to be evident in the results of the needs analysis survey. An additional element of this would be to find out whether there is more interest in a stand alone Irish AAC system or a bilingual English/Irish system. A prominent usage of this technology in home and educational settings would be expected as well, which falls in line with the evidence found in the literature review.

The variety of reasons as to why people would utilize this technology should also fall in line with many of the factors that were uncovered during the literature review process, such as being able to access the school curriculum, participate in the local community and to advocate for language rights and disability awareness. Finally, considering that the assessment and intervention process in Ireland is mainly conducted through the medium of English, the interest in Irish based AAC to help bridge the gap in the lack of services would be evident in some form.

**Results: Key Findings**

130 people answered the needs analysis survey, with 35 participants completing the survey or progressing over three-quarters of the way through the survey. 58% of those who filled out the survey were filling it out in the capacity of parent/guardian. 16.67% filled out the survey as an independent AAC user.

**Diagnosed Conditions of AAC Users**

AAC users with Autism Spectrum Disorder (ASD) accounted for 33.88% of the participants who answered the survey. Other conditions included Developmental Language
Disorder (DLD), Intellectual Disability (ID), Cerebral Palsy, Verbal Dispraxia and Retts Syndrome.

Devices used by participants:

![AAC Device Usage](chart)

*PEC, LAM, Tobii Dynavox, Different device, No device

*Figure B:

**AAC device usage of participants**

Seeing so many different devices and systems quoted shows that there is a very strong market in Ireland that caters for a variety of AAC users, regardless of if they have one medical condition or multiple conditions. There is a sense of strong usage of PECs (Picture Exchange Communication), with 15% of participants who responded to this question indicating they use PECs on a regular basis. This shows the importance of using low-tech AAC as well as high-tech AAC. Another interesting result from this question is that 32% of participants who responded to the survey do not use AAC, a response which would presumably be in terms of using high-tech AAC devices.

*Common settings in which AAC is used.*
There is a high percentage of AAC users who utilise the technology in the home (44%), with educational settings following this at 25% of participants who responded to this question. These results are relevant to the settings where a high majority of AAC users receive strong support from family members and other communication partners. However, the low response of using AAC in public settings (11%) gives a sense of a lack of accommodation for AAC users in public settings, indicating a need for public places and services to be given the opportunity to become more educated on the importance of AAC systems and providing for AAC users.

**Key features to include in developing Irish AAC technology**

The inclusion of an Irish Text-to-Speech Synthesiser and Predictive text/word or phrase prompting polled the highest at 17% as the most important elements to include in an Irish AAC device. The desire for pre-programmed phrases in Irish (15%), for the keyboard to include Irish diacritics (15%) and having the opportunity model their own phrases and store them in a dedicated folder within the AAC device/application (15%) followed as other key elements to
include in the device. Interestingly, 12% of participants who responded to this question noted that they would be interested in all of the elements mentioned.

When asked about whether participants were more in favour of a standalone Irish AAC device or a bilingual AAC device/integrated into the device that they already use, 55.17% were in favour for Irish AAC technology to be integrated into the current AAC technology used, compared to 44.83% who were interested in standalone AAC technology.

**Reason for interest in AAC technology:**

<table>
<thead>
<tr>
<th>Access the school curriculum</th>
<th>For school</th>
<th>Promoting Irish for all users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being able to take oral exam in Irish Leaving Certificate without issues</td>
<td>Introduced with an AAC user that is already proficient in their main language first</td>
<td></td>
</tr>
</tbody>
</table>

*Figure D: Additional reasons for interest in Irish AAC*

8% of participants who responded cited wanting Irish AAC because it’s the home language of other family members, with 20% citing how the language is an integral part of who they are. For these participants, having access to Irish was crucial as it is a part of their identity. Additional
reasons such as having the ability to access the school curriculum and promoting the use of Irish for all members of society is noteworthy. This would indicate that much more work needs to be done to increase accessibility of the language for those with additional needs in educational settings.

**Overall Review of Study**

*How does AAC technology fit into creating an inclusive educational environment for those who want to engage with the Irish language?*

The data gathered from the needs analysis survey offered a great starting point for beginning the development of Irish AAC in the Speech and Phonetics Laboratory in Trinity College Dublin, with continuous research and study into the sociolinguistics elements of the data. Utilising the data from Figure D in particular, the aim of developing technology that will increase accessibility for the language in educational settings, where children can engage in the Irish language both at home and in school. The data collected indicates that many of these children want the opportunity to connect more with the language and build upon their existing communication skills to express themselves in Irish and mould their identity with a deeper understanding of their language and culture. Too often this opportunity is taken away from children who have additional communication needs without giving them any opportunity to explore their identity in this way.

**Key points from survey analysis**

Data collected and analysed from the survey shows a strong correlation between AAC assessment and intervention with younger members of society, indicated by a high percentage of parents filling out the survey. This would suggest that there is a significant amount of research
being conducted at the early intervention stage but not as much continuous research being conducted with adult AAC users.

All participants who indicated usage of AAC systems indicated a high percentage of usage in home and educational settings, but still noted challenges in using these systems in public settings. This data indicates that along with development of Irish AAC, efforts need to be made to educate the wider community on the importance of AAC and its communicative role for the user in question.

Open-ended questions on why people wanted this research was very enlightening, with many answers correlating with a desire for “equal opportunity”, to be able to participate in Irish speaking communities and to strengthen their cultural and linguistic identities.

Over 96% were unable to access SLT services in Irish. This indicates a huge gap in service provision, making it challenging to advocate for Irish AAC without an SLT who uses the language or can appreciate the culture attached to Irish, as seen with other languages. This statistic is also aligned with the reality that it is difficult enough to access services in English in Ireland, let alone trying to accommodate those who wish to have this system provided for them in Irish. Significant challenges lie ahead with making these services fully accessible through Irish for AAC users & communication partners.

Conclusion

This survey is only the beginning in establishing future research and development for Irish language Assistive Technology and AAC technology in the future. The ABAIR team based in the Speech and Phonetics Laboratory in Trinity College Dublin have begun developing a prototype utilising this data and integrating the Irish language Text-To-Speech Synthesiser (TTS)
into the test system. Examining the intricacies of these systems and attempting to understand whether or not certain elements, such as the independent modelling boards, can actually transfer easily into another language with another grammatical and contextual structure. The other element of experimentation is to see if it is possible to merge the synthesiser into the existing technology. While the technological aspects do indeed take a huge role in the future development of Irish AAC systems, the important links to culture and language will need to be taken into account, similar to the research conducted by Collin Stone (2019) on Te Reo Maori in New Zealand. The opportunity to test prototypes with subjects from the various stakeholder groups could potentially be the best way to ensure that the AAC development is applicable to different demographics and can be applicable to various diagnoses as well.

The data indicates that there is a significant interest within AAC user and allies’ circles to access such a resource so that every opportunity is provided for those who need this technology to fulfil their potential in society.

The importance of recognising the cultural and community links to the language will hopefully shape future research and will break down barriers in terms of the accessibility of Irish for those learning the language, such as those who have the language in their home but have not had equal opportunity to engage in the language. It also offers the opportunity to contribute to international research in AAC technology and minority languages using such methods to see their language grow and continue as a living language.

This research is a first step to addressing one of the most prominent barriers in any language-communication. By offering alternative and accessible ways for people with speech difficulties and challenges to communicate, this broadens the diversity of communities and offers great insight into how research and government policies can be conducted and implemented to
ensure that those possibly seen as outliers in Irish language communities will be afforded the same opportunity to immerse themselves in the Irish language in their daily lives.

AssistiveWare. (2021). An introduction to Augmentative and Alternative Communication (AAC). What is AAC and who is it for? What are the different types of AAC? What are the benefits of AAC? Retrieved 20 May 2021 from https://www.assistiveware.com/learnaac/what-is-aac

Census 2016 Summary Results (2016). Central Statistics Office


Irish Association of Speech and Language Therapists (IASLT) IASLT. (2019). Speech and language therapy service provision for adults with an intellectual disability and communication needs: Definition, Service Provision and Recommendations for Change.


