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Preservice Augmentative and Alternative Communication Coursework Across 311 Speech-Language Pathology Graduate Programs

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Abstract

Speech-language pathologists often report a lack of preparedness to provide augmentative and alternative communication (AAC) services, suggesting the need for improved graduate level training. Recent studies of AAC coursework offerings found 86% to 88% of programs offered AAC coursework, but these studies relied on survey methods with limited numbers of responses. This study examined AAC course offerings at 311 graduate programs using website and course catalog reviews, supplemented by direct contact with departments when dedicated AAC courses could not be found using online resources. Of these, 282 (90.68%) offered a dedicated AAC course, and 16 (5.14%) offered AAC in combination with another topic. Among those offering dedicated courses, semester credit hours varied from 0.67 to 4, they were primarily offered in the second year of the graduate program, and 235 (83.33%) required students to take the course. This study provides the most comprehensive review of AAC course offerings nationally to date with respect to sample size. Variation in AAC course design features across universities, such as course credit hours and the term the course is offered, may contribute to disparate preparedness. Further research in scholarship of teaching and learning for AAC coursework and preservice training is essential to improve preparedness to serve clients with AAC needs.

Keywords

augmentative and alternative communication, speech-language pathology, scholarship of teaching and learning

Cover Page Footnote

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Speech-language pathologists (SLPs) are critical members of assistive technology teams, providing specialized knowledge and skills in augmentative and alternative communication (AAC) (American Speech-Language-Hearing Association [ASHA], n.d.). Trained SLPs are essential to support clients with spoken and written language disabilities to communicate effectively and participate meaningfully in daily activities. According to the ASHA (2022) Schools Caseload Survey, 71.2% of 1188 ASHA-certified SLPs regularly provided service to students who use AAC. Further, according to ASHA's (2021) Health Care Survey, AAC was among the most common treatment areas in both pediatrics and adults.

Approximately 5 million Americans are estimated to have AAC needs (Beukelman & Light, 2020). To meet these needs, SLPs must have the skills to provide high-quality assessments (including feature matching) and evidence-based treatment (ASHA, n.d.). Unfortunately, clinicians frequently report a lack of knowledge and skills necessary to effectively evaluate and treat clients with AAC needs (e.g., Assistive Technology Industry Association, 2011). Douglas and colleagues (2020) completed a focus group study of AAC practitioners in Michigan. A set of open-ended questions was posed to 13 participants who attended a statewide AAC conference. A thematic analysis suggested participants were not provided adequate coursework or clinical training in AAC at the graduate level. Given limited training at the preservice level, clinicians frequently had to pursue training post-graduation. Sanders and colleagues (2021) surveyed practicing school-based SLPs to evaluate their confidence in assessment and feature matching. Their results suggested that school-based SLPs felt variable levels of confidence across components of feature matching and assessment. They also found that 29% of respondents did not complete an AAC course during their graduate training. Prior studies have found that difficulty accessing SLPs or teams confident in AAC was a substantial barrier to effective treatment for clients and their families (Baxter et al., 2012; Donato et al., 2018).

Preservice training refers to coursework and clinical experiences received by undergraduate and/or graduate students prior to becoming SLPs (Sauerwein & Burris, 2022). Literature exploring preservice training in AAC has recently expanded which may be due to increased interest in the topic, increased interest in scholarship of teaching and learning in AAC, or a response to contemporary issues related to AAC specialty certification, to name only a few possibilities. In response to limited clinical preparedness to work with clients who have AAC needs, the American Board of AAC (AB-AAC) received approval from ASHA's Council for Clinical Certification to develop a Clinical Specialty Certification in AAC. Primary arguments for the creation of the specialty certification frequently suggest a lack of training of SLPs leading to poor identification of AAC candidates, delayed and ineffective treatment approaches, and omitted components of AAC assessment which may lead to device abandonment (AB-AAC, n.d.). This specialty certification would recognize clinicians as having received advanced training in these areas to make effective AAC recommendations. However, resistance to the specialty certification has grown, including opposition statements from the United States Society for AAC (Quach, n.d.) and the National Joint Committee for Communication Needs of Persons with Severe Disabilities (2019), as well as a concerned group of professionals known as Stop AAC Specialty Certification work group (n.d.). The Stop AAC Specialty Certification work group advocates that the certification may result in insurers requiring certification to fund devices which could further limit client access to AAC devices, that the need for such a certification is not supported by evidence, and that the certification effort lacks transparency (Stop AAC Specialty Certification, n.d.). As an

alternative to the specialty certification, the work group proposes higher quality preservice training as a more effective solution.

Preservice training has been proposed as critical to bridge knowledge and practice gaps in AAC (e.g., Kovacs, 2020). Recently, Barman and colleagues (2023) surveyed 726 graduate students enrolled in accredited speech-language pathology graduate programs to understand their AAC training and feelings of preparedness to serve clients with AAC needs. Their study found that 40% of participants either disagreed or strongly disagreed with the statement "I feel prepared to work with AAC clients after graduation." Interestingly, they found that students who completed a larger number of AAC courses (e.g., 3+) typically expressed higher agreement with the preparedness statement. Their study suggests the importance of AAC coursework in supporting students to feel more prepared to work with AAC users.

Multiple studies have documented the state of graduate-level coursework in AAC over the past two decades. Koul and Lloyd (1994) pioneered research on this topic by surveying special education and speech-language pathology graduate programs. In a survey distributed to 437 programs, 44.8% of special education programs responded, and 77.6% of speech-language pathology programs responded. Their results found that 24% of special education programs and 62% of speech-language pathology programs had a dedicated AAC course. A year later, Ratcliff and Beukelman (1995) published a survey study in which they distributed a survey to graduate training programs in speech-language pathology. Fifty-eight percent of institutions responded, 82% of which provided at least one dedicated course in AAC. Their study also found that students frequently received limited, if any, clinical clock hours in AAC.

In 2005, ASHA included "communication modalities" as a content standard required to receive the Certificate of Clinical Competence. Given this change, Ratcliff and colleagues (2008) provided an updated description of graduate training in AAC. Similar to the 1995 study, they distributed a survey to graduate training programs in speech-language pathology and received a 58% response rate. Of those who responded, 73% reported offering at least one dedicated AAC course, though only 52% required the AAC course to be taken as a graduation requirement, while the other programs offered the course as an elective. Similar to the 1995 article, 47% reported that 0-25% of their cohorts received clinical clock hours in AAC. Perhaps most notably, 67% reported none to half of their students were prepared to provide AAC services to clients. A couple of years later, Costigan and Light (2010) conducted a literature review of studies on preservice AAC training for SLPs, occupational therapists, and special education teachers. In addition to the reviews of studies mentioned above, their results suggested that professionals in allied professional graduate programs also received very limited training in AAC.

In 2014, ASHA replaced "communication modalities" with "augmentative and alternative communication modalities" to reflect the increased focus on preservice preparation in AAC. Given this change and that over a decade had passed since the prior study by Ratcliff and colleagues, Johnson and Prebor (2019) provided a new update on preservice training in AAC at the graduate level. They distributed a survey to 279 accredited speech-language pathology graduate programs to determine the number of programs offering AAC coursework and practicum experience, and characteristics of the offered coursework (e.g., format, reading materials, activities, and time devoted to specific age groups). Their study found that 86% of responding institutions offered at

least one course in AAC. This was a notable increase since the decade before and may suggest positive effects of including AAC as a requirement for certification and/or increased awareness of the need for clinical preparation in this area. However, only 79 of the 279 (28%) graduate training programs responded to their survey.

In the year that followed, DeJarnette and Wegner (2020) provided another update to preservice training in AAC at the graduate level. In a survey distributed to 251 programs, they received a 33.8% response rate. Interestingly, their study found that 96% of graduate programs offered clinical coursework in AAC, 88% of which was through dedicated AAC coursework. Additionally, they found 86% of responding programs had AAC as a required course for graduation. The higher portion of programs offering AAC coursework was likely due to including programs that offered "combination" coursework where AAC was embedded in a course with other topics. Their study also found that 63% of programs reported that at least half of their graduate students earned "some" clinical clock hours in AAC which was a notable improvement since reported clock hours on this decades earlier.

While offering academic coursework in AAC is essential for effective preservice training, ensuring the coursework is high-quality is equally critical for improving clinical preparedness. Most recently, Sauerwein and Burris (2022) published a study in which they surveyed graduate programs to examine AAC course design. Sixty-four of 265 graduate programs responded to their survey (24.2% response rate). Their study was an interesting first exploration of course design across the nation and suggested variation in course features from program to program including differences in content areas, assignments, readings, and resources. Although course hours data were not collected in their study, Sauerwein and Burris (2022) suggested this likely has an impact on AAC course features.

While ASHA mandates AAC to be part of graduate education as a content standard, individual programs achieve the required knowledge and skills in AAC in various ways, creating opportunities for varied levels of clinical preparedness. Prior literature demonstrates an increase in the number of graduate programs offering AAC coursework over the past two decades, but gaps in understanding the state of preservice AAC training persist. The literature reviewed above provides insight into the number of graduate programs that offer AAC coursework, but the results of these studies relied on surveys with relatively low response rates. As a result, their findings may only partially represent the state of preservice AAC coursework nationally. Further, as described by Sauerwein and Burris (2022), course length and credit hours may affect AAC course features and therefore the quality of AAC training, and this too has not been systematically studied.

Purpose

The purpose of this study was to investigate AAC coursework offerings across master's degree programs in speech-language pathology accredited by the ASHA Council on Academic Accreditation (CAA). Specifically, we sought to investigate the number of programs that offer coursework in AAC and to explore the number of credit hours each institution offers in AAC coursework. Further, we sought to identify during which term(s) AAC courses were offered to students. Given findings from prior studies along with the first author's experience teaching AAC coursework at multiple institutions and networking with instructors from other universities, we

hypothesized that the number of graduate programs offering dedicated AAC coursework would be lower than recent studies and would typically be offered in the second year of a student's graduate training. Further, we anticipated high variation in the instruction time for AAC coursework.

Method

This study was reviewed by the Portland State University Institutional Review Board (HRPP #207020-18) and was determined to not require Human Subjects Protection Program review under federal regulations due to not including human subjects.

We aimed to expand upon previous literature by using public-facing data sources rather than relying on faculty to report on coursework to achieve a more comprehensive understanding of the state of graduate AAC training. A recent study by Mason and colleagues (2020) evaluated the state of graduate education in cleft/craniofacial and fluency disorders. To do so, they reviewed graduate program websites to identify whether courses were offered. Of 277 graduate programs, they were able to include 276 in their analyses, suggesting these methods could be used to comprehensively describe graduate coursework offerings nationally. Thus, their methods were adopted for this study and modified as described below.

Initial data collection for this study began in the fall of 2020. ASHA's CAA Program Listing as of 7/28/2020 (CAA, n.d.) was used to identify graduate speech-language pathology programs as well as university and department websites. All programs that were accredited (n=276), on probationary status (n=2), candidate status (n=32), or applying for accreditation (n=1) were included in our search to ensure comprehensive data collection of AAC course offerings nationally.

Consistent with the approach by Mason and colleagues (2020), academic course catalogs, course descriptions, and department websites were referenced to gather information regarding graduate curricula. Program data were recorded for the following:

- Department website (from the CAA) and course catalog or department course sequence website
- Date the website was evaluated
- AAC course offerings including (a) dedicated AAC course offered, (b) AAC course not offered, (c) combination course offered, or (d) undergraduate course offered
- Whether AAC was a required graduate course
- Number of course credits
- Year and term that the course was offered
- Advanced AAC course offerings
- Number of course credits for advanced course
- Year and term that an advanced course was offered
- Academic schedule

An AAC course was labeled as a "dedicated course" if a course title indicated "augmentative and alternative communication" or a similar title as judged by the reviewer or if the course description suggested content areas primarily focusing in AAC. If a course appeared to have two or more topics based on either the course title or course description, or if the course description was vague so that the focus of the course could not solely be determined to be focused on AAC, the course

was labeled as a "combination course" (e.g., Autism and AAC; motor speech disorders and AAC). Notably, in some cases we were unable to determine from the title or course description whether the course was specifically dedicated to AAC, such as in cases where client groups may be a primary or secondary focus (e.g., "AAC and nonvocal individual," "AAC and complex communication disorders," AAC and developmental disabilities"). In such cases, these courses were labeled as "combination" courses out of caution. Only programs offering dedicated AAC courses were included for further analysis of course credits and the year and term that the course was offered. If an AAC course or combination course could not be identified, the undergraduate course catalog and course descriptions were searched.

We also set out to determine if AAC coursework was a requirement for graduation from the university's master's program. An AAC course was determined to be "required" if 1) it was specifically listed as a requirement or core class, 2) a list of coursework was provided in which a smaller set of classes was listed under "elective", or 3) a curriculum map was provided in which elective courses were clearly indicated. If we were unable to determine whether the course was required, then it was coded as "not listed."

The number of course credit hours were frequently found using the data sources above. If a university utilized "units" instead of credits, the university registrar's website was reviewed to determine a conversion to semester credit hours. Some universities offered a range of credit hours (e.g., 2-3 credits) and were coded in their own category. University websites were also searched to determine the academic schedule (quarter, trimester, semester); this search included reviewing the university's definition of a credit hour, when available, and the university's academic calendar. A conversion of 1/1.5 hours per credit was used to convert quarter hour credits to semester hour credits. Year and term that the AAC course was offered were typically gathered through curriculum maps when available, though were occasionally found in academic catalogs. If a university offered a course in multiple terms, each term was included during data collection. In some cases, if a year, term, or both could not be identified, these were coded as "unspecified." Additionally, if a program provided a curricular sequence with labels such as "Semester I, Semester II, etc." but we were unable to identify whether the first term began in summer or fall, the program was labeled as "unspecified." If a program offered both a full-time and part-time schedule, only the full-time schedule was considered during data collection; if a slightly elongated program was offered that was also considered "full-time," both were used in analyses for term that the course was offered. An advanced AAC course was defined as a graduate level AAC course that listed a previous AAC course as a prerequisite.

The second and third authors first reviewed graduate websites and course catalogs from 7/9/2020 through 12/29/2020 and entered program data. A second review of all graduate websites and course catalogs was completed between 3/15/2022 to 8/6/2022 by the same authors. After their entries were completed, the first author (BE) reviewed all graduate websites and course catalogs to verify the accuracy of all entries between the dates of 10/10/2022 and 11/21/2022. Due to the extensive time that passed since the original review using the 2020 CAA Program Listing, we also reviewed the 2022 CAA Program Listing (CAA, n.d.). If a program lost their accreditation status since the initial review, then it was removed from our analyses. Any newly accredited program as well as candidates that were not previously in our review were added. For these programs, the first author (BE) reviewed the graduate websites and academic catalogs between the dates of 11/15/2022 and

11/20/2022 and entered program data. The second author (ES) reviewed half of the newly added graduate websites, while the third author (MP) reviewed the remaining half between the dates of 11/21/2022 and 12/29/2022. All cases of disagreement in any entry were resolved either by a live consensus meeting among the three reviewers in which the department website and other information sources were evaluated together or by asynchronous email communication. The first author (BE) also independently searched for the academic schedule between the dates of 2/27/2023 to 3/30/2023. Given the objective nature of this data, academic schedule was not reviewed by a second or third reviewer.

PennWest University was listed as accredited on the CAA listing. During data collection, we found PennWest University had two campuses including Edinburo and California, though each were also independently accredited and on the CAA listing. Thus, the PennWest University listing was removed in favor of retaining the two independent programs.

We completed additional follow up via email and phone if a program's website or course catalog suggested the AAC course was in combination with another topic, if the course was offered only at the undergraduate level, or if we were unable to find if a course was offered. For these programs, department chairs, program directors, course instructors, or other relevant administration were contacted via email or phone using contact information available on their department website. Additionally, any program that did not offer an AAC course at the graduate or undergraduate level as a dedicated or combination course was also asked to describe how their students achieve AAC competencies meeting ASHA Standards IV-C and IV-D. At least three attempts to contact each university program were made by the first author between the dates of 11/6/2023 and 11/22/2023.

We received responses from 37 of the 50 programs which provided sufficient information to recode the data from the original website review. Email responses were reviewed by all three authors to reach consensus on how to recode the data according to the criteria outlined above. One university program, which we were initially unable to determine if an AAC course was offered based on their website, declined to provide additional information after incompletely responding to questions about their AAC course offerings. One other program, which was initially categorized as offering an AAC course at the undergraduate level only, suggested offering an AAC course at the graduate level but provided an incomplete response to the questions and did not respond to attempted follow-up. In both cases, their records were coded as "not found" out of caution. Of the 20 universities in which we were unable to find an AAC course offering from their department website, four did not respond to email or phone requests for information; records for these programs were coded as "not found." For two universities that were originally coded as offering an AAC course at the undergraduate level and did not respond to attempted follow-up, as well as for five universities that were originally coded as offering an AAC course in combination with another topic and did not respond to attempted follow-up, we maintained the original consensus data from the three reviewers based only on the website review.

Results

Of the 311 accredited, candidate, probationary, and applying CAA-recognized programs evaluated, 282 offered a dedicated AAC course (90.68%), 16 programs offered a combination course (5.14%), four programs offered only an undergraduate AAC course (1.29%), four programs did not offer a course and reported infusing AAC topics across their curriculum, and six programs (1.93%) did not provide a response or a response with sufficient information for the authors to recode their data. One program offered both a dedicated and a combination AAC course, both of which were included in the study as separate entries. One program which offered a dedicated course reported that their yearly course offering was contingent on sufficient student enrollment. Figure 1 displays these results graphically.

Figure 1

Number of Graduate Programs Offering AAC Coursework Based on Available University Website Information

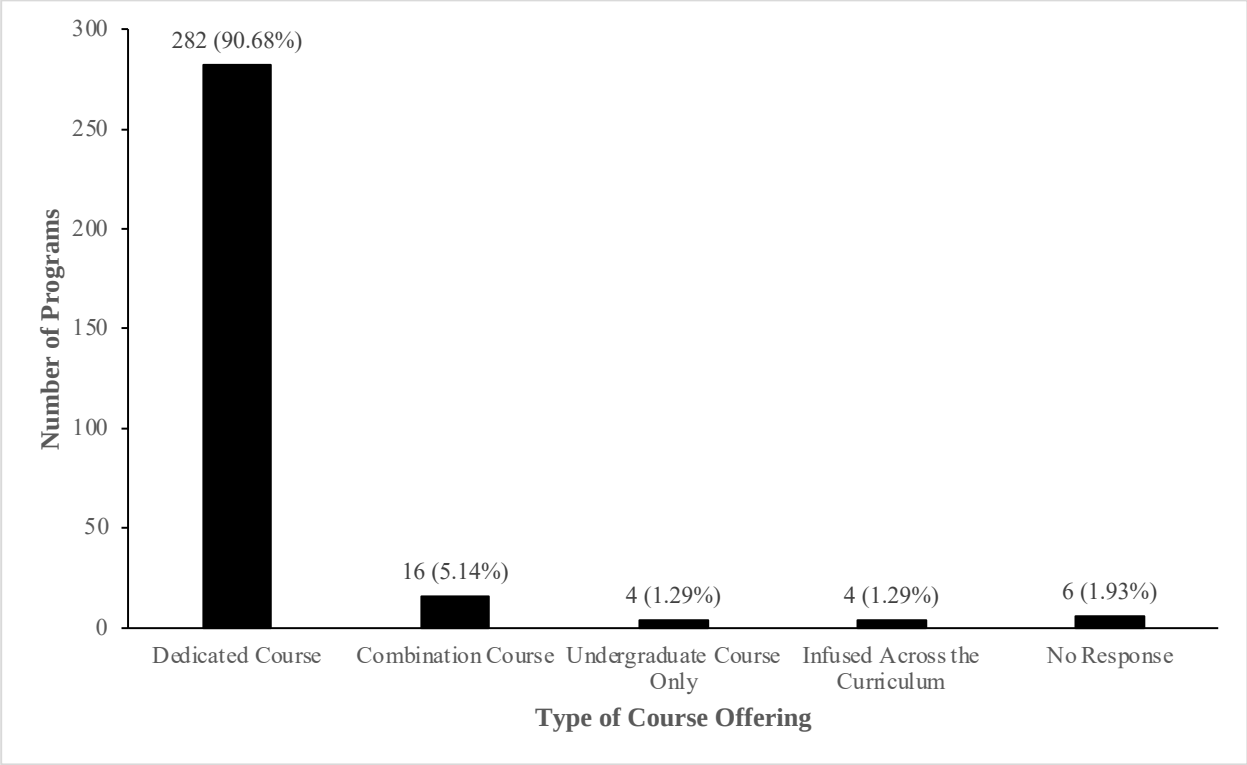
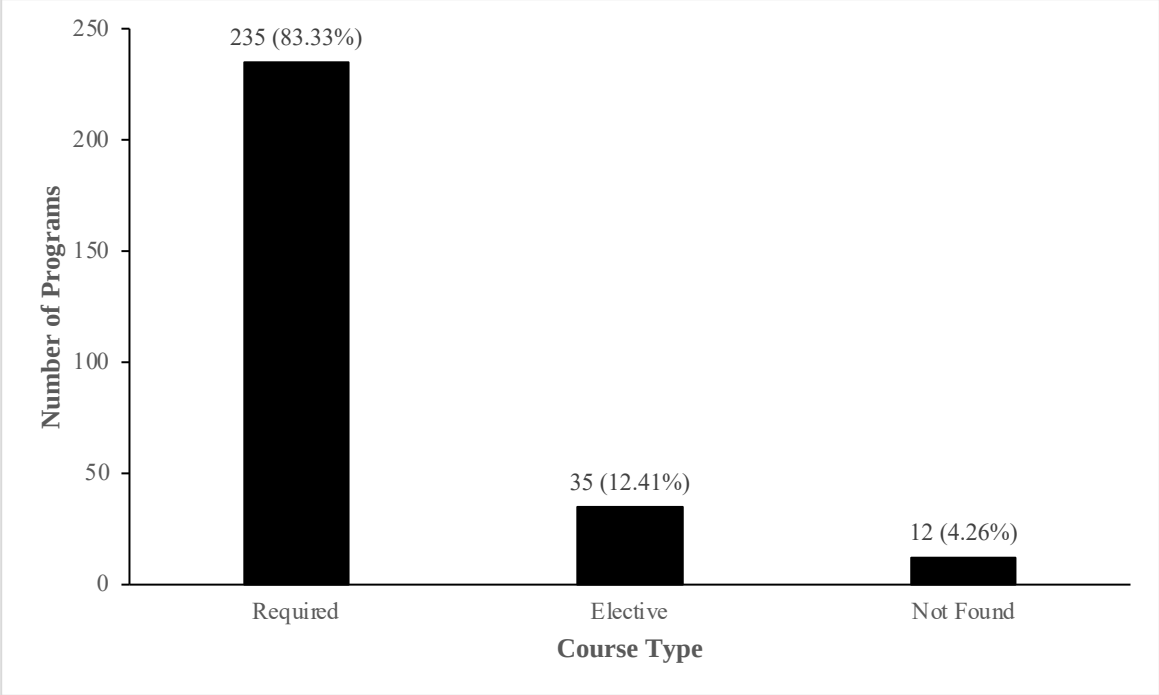


Figure 2 displays the number of university programs that required students to complete AAC as a graduate requirement or offered it as an elective. Of the 282 programs with a dedicated AAC course, 235 (83.33%) required it as a graduate requirement, whereas 35 (12.41%) offered it as an elective. We were unable to determine if a course was required for the remaining 12 (4.26%) programs based on information from their website (follow up was only completed for programs whose website suggested they did not offer a dedicated AAC course at the graduate level). Of the 16 programs offering AAC as a combination course with another topic, 14 (88%) required it as a graduate requirement, whereas two (13%) offered it as an elective.

Figure 2

Requirements to Complete AAC Coursework in Programs That Offer Dedicated AAC Courses



Out of the 311 recognized programs, 300 utilized a semester schedule (96.46%) while only nine used a quarter schedule (2.89%) and two used a trimester schedule (0.64%). Of the 282 programs offering a dedicated AAC course, two programs (0.71%) offered the course for 0.67 semester credit hours, 22 programs (7.80%) offered the course for one-credit hour, two programs (0.71%) offered the course for 1.33 credit hours (0.77%), two programs (0.71%) offered the course for 1.5 credit hours, 89 programs (31.56%) offered the course for 2 credit hours, one program (0.35%) offered the course for 2.67 credit hours, and 157 programs (55.67%) offered the course for 3 credit hours. Some universities offered a range of credit hours for their AAC course, including one university (0.35%) offering the course for 1-2 credit hours, one university (0.35%) offering the course for 1-3 credit hours, and one university (0.35%) offering the course for 2-3 credit hours. These results are displayed in Table 1. We were unable to determine the number of credit hours offered at three university programs (1.06%).

We identified information on the term an AAC course was offered for 189 of the 282 (67.02%) university programs offering a dedicated AAC course. Figure 3 displays the results of when courses were offered. Of those 189 programs, 13 programs offered their AAC course in two different terms, and one program offered it in three different terms. 51 (26.98%) programs offered their AAC course in the first year (summer through spring), with one (0.53%) offering it in the summer, 20 (10.58%) in the fall term, two (1.06%) in the winter term, and 29 (15.34%) in the spring term. Most programs offered AAC in the second year of the student's graduate program (n = 141, 74.60%), with 52 (27.51%) universities offering AAC in the summer term, 66 (34.92%) in the fall term, 1 (0.53%) in the winter term, and 29 (15.34%) in the spring term. One (0.53%)

program offered their AAC course in the summer after the student's second year, two (1.06%) offered it in the fall of the third year, and one (0.53%) offered it in the spring of the third year.

Table 1

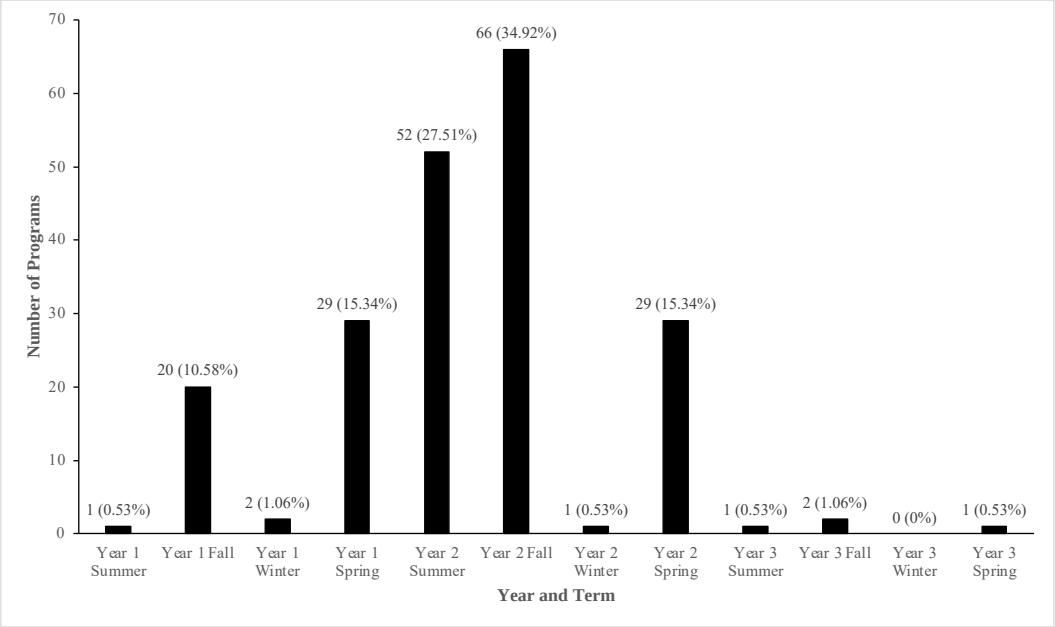
Semester Credit Hours at Universities Offering Dedicated AAC Coursework

Semester Credit Hours	Number of Programs	Percentage of Programs
0.67	2	0.71%
1	22	7.80%
1.33	2	0.71%
1.5	2	0.71%
2	89	31.56%
2.67	1	0.35%
3	157	55.67%
4	1	0.35%
Range 1-2	1	0.35%
Range 1-3	1	0.35%
Range 2-3	1	0.35%
Not Found	3	1.06%

Advanced AAC courses were found at only eight institutions which are displayed in Table 2. Of these, seven programs were on a semester schedule, and one was on a quarter schedule. Advanced courses were offered for 3 semester credit hours at two institutions, 2 semester credit hours at two institutions, 1.33 semester credit hours at one institution, 1 semester credit hour at two institutions, and another institution offered two advanced courses offered for 1 and 3 semester credit hours. One program offered their advanced course during the summer between the first and second year, another during the second fall of year two, and a third in the summer at the end of the second year. We were unable to find the term the advanced AAC course was offered for the remaining five programs.

Figure 3

Years and Terms Dedicated AAC Courses Were Offered



Note. n=189 graduate programs. We were unable to locate this information for 93 (49.21%) programs. Thirteen programs offered their AAC course in two different terms, and one offered it in three different terms.

Table 2

University Programs Offering Advanced AAC Coursework

University Program Offering Advanced AAC Coursework	Number of Semester Credit Hours	Year and Term in Sequence
Boston University	2	Second year fall
Howard University	3	Unspecified
Nova Southeastern University	3	Unspecified
The University of Akron	1, 3 (two courses)	Unspecified
University of Arkansas Fayetteville	1	Unspecified
University of Cincinnati	2	Summer between the second and third year
University of Washington	1.33	Unspecified
Wichita State University	1	Summer between the first and second year

Discussion

This study sought to expand upon previous research by using alternative, non-survey methods to provide a more comprehensive understanding of AAC course offerings across CAA recognized graduate programs in speech-language pathology. Universities are directly incentivized to maintain accurate course sequences on their department websites given interest by prospective graduate students as well as CAA accreditation standards requiring accurate reporting of academic offerings (Standard 1.9; CAA, 2023). Thus, university websites served as an effective means to study the state of AAC course offerings nationally. Further, additional follow-up was attempted with all universities that did not appear to offer a dedicated AAC course based on their website. As a result, this study provides the most comprehensive review of AAC course offerings to date in regard to sample size rather than relying on statistical methods to estimate course offerings from a subset of programs. Further, this study provides important additions to the literature by documenting credit hours and the term AAC courses were offered.

Our study found a greater number of programs offering dedicated AAC coursework (90.68%) when compared to recent findings by Johnson and Prebor (2019) and DeJarnette and Wegner (2020), who found 86% and 88% of programs offered dedicated coursework, respectively. The greater number of programs offering dedicated AAC coursework may be due to a larger sample collected in our study, differences in data collection methods, and time since these studies took place. Notably, it has previously been reported that there is an increasing trend of graduate programs offering dedicated AAC coursework over the past two decades (DeJarnette & Wegner, 2020). The findings from our study support this claim, suggesting continued growth in percentages of graduate programs offering dedicated AAC course offerings when compared to early estimates of graduate training extending from Ratcliff and Beukelman (1995) and Ratcliff and colleagues (2008), who found 82% and 73% of programs offered dedicated coursework, respectively. Further, multiple recent changes to course offerings were reported by some university contacts, including recent changes to their AAC course being required to graduate, as well as new dedicated or combination courses being reviewed by university administration. These findings suggest that advocacy in AAC training has been successful but continues to be necessary to ensure students are offered AAC coursework during their graduate programs.

We also found that 83.33% of the programs we investigated which offered a dedicated AAC course did so as a required course for graduation. These results are consistent with findings from Sauerwein and Burris (2022) who found that 84.4% of programs in their study required AAC coursework to graduate as well as DeJarnette and Wegner (2020) who found that 86% of programs required AAC coursework to graduate. However, our findings suggest fewer programs require AAC to graduate compared to findings by Johnson and Prebor (2019) who found that 92% of programs in their study required AAC coursework to graduate. Considering programs which offered AAC integrated with other topics (i.e., combination courses), it is unclear how much of each course is dedicated to AAC topics and therefore we elected not to include them in further analyses. These differences are also likely attributable to differences in sample size and data collection methods.

Timing of graduate coursework may be a critical yet understudied area shaping the graduate student experience. Of the 189 graduate programs that listed the term their course was offered, 138

(73.02%) offered AAC only in the second or third year of the student's graduate program with the majority occurring in the summer between the first and second year (n = 52) and fall of the second year (n = 66). Notably, many universities offer shorter summer sessions in which students may be required to take coursework at a higher intensity for a shorter period. The effects of AAC course intensity (massed or distributed) on learning outcomes have not been studied, but results of an investigation comparing learning outcomes from a one-week massed learning and eight-week distributed learning online asynchronous AAC course are currently in analysis (Eddy Sauerwein, Meloy, & Sanders, in process).

The relative delay in the timing of the AAC coursework compared to other courses may reflect different priorities within graduate programs, prerequisite coursework, pedagogical decisions, or constraints related to faculty availability, among other factors. The motivations behind timing of AAC coursework relative to other topics warrants further study. Placement of AAC coursework in the second year of a program may be due to prerequisite coursework that instructors believe to be beneficial to support student learning in their AAC course. For example, some instructors may find that students with prior knowledge of populations who may benefit from AAC or experience with spoken language interventions (e.g., recasting, modeling) allows them to prioritize their course focus on other areas. Alternatively, timing of AAC coursework being offered only in the second year may reflect perceptions of AAC as a specialized service or belief that AAC is only for low-incidence populations. It may also suggest an underlying philosophy of AAC as secondary to other treatment approaches in earlier occurring coursework, such as motor speech disorders or language disorders. Further evidence for such underlying beliefs may be supported by course titles observed in our data, such as "AAC and Severe Disabilities", "AAC and the Nonvocal Individual", "Differential Diagnosis of the Nonverbal Child", "Special Populations and Communication Modalities", and "AAC: Multiple Disabilities". If AAC services are consciously or unconsciously considered secondary to spoken language interventions, this may reinforce debunked practices of AAC as a "last resort." Notably, some programs suggested course titles and information relevant to current terminology in the disability community, such as "Neurodiversity and AAC". Given the application of AAC throughout the lifespan and across treatment domains, reconsidering timing of AAC relative to other coursework may help to improve identification and implementation of AAC across many subgroups of potential AAC users.

Providing AAC coursework within the first two terms of the graduate curriculum should be considered given that students in many graduate programs apply for or are matched with second year clinical externships during the winter or spring terms of their first year (e.g., Indiana University Bloomington (n.d.), Iona College (n.d.), Jacksonville University (n.d.), Portland State University (n.d.)). If students are not exposed to AAC through coursework or clinical experiences before selecting externships, they may have less interest in selecting or matching to an externship with an AAC focus. By extension, if externship experiences predict future employment interests, students may not seek a position with a high proportion of AAC clients due to limited preparedness to work with these populations, though this relationship has yet to be systematically studied. Further, fewer practicing SLPs with AAC experience may result in reduced externship training opportunities in AAC, further exacerbating the problem and contributing to a cycle of reduced readiness to provide AAC services. For these many reasons, graduate programs should consider reviewing and modifying their curricula to expose their students to AAC coursework and clinical experiences early within the first year of their graduate program.

When comparing dedicated AAC course offerings to dedicated courses in cleft/craniofacial and fluency disorders (Mason et al., 2020), our findings suggest fewer programs offer dedicated coursework in AAC (90.68%) than fluency disorders (94.53%) though more programs offer dedicated coursework in AAC than cleft/craniofacial differences (53.73%). Further, while Mason and colleagues (2020) found that only 95.37% of programs that offered dedicated fluency disorders coursework offered it as a required course, only 83.33% of programs in our study that offered dedicated AAC coursework required students to take the course. The findings of fewer programs offering a dedicated AAC course or requiring students to complete the course compared to fluency disorders coursework is somewhat surprising. While the prevalence of stuttering across all age groups varies depending on the age of children included, Boyle and colleagues (2011) indicate a prevalence rate of 1.6% for children between 3 and 17 years. The prevalence of AAC needs has not been evaluated, though Beukelman and Light (2020) estimate that approximately 5 million Americans may benefit from AAC (approximately 1.5% of the total US population). Given a comparable estimated prevalence of AAC needs to fluency disorders, as well as the application of AAC to many clinical treatment areas across the lifespan, it is surprising that dedicated AAC courses are not more frequent among graduate programs. However, AAC as an area of practice is considerably younger than fluency. Whereas published literature on stuttering began as early as the 1910s (Andrews et al., 1983), many individuals who may have benefitted from AAC may have been institutionalized until deinstitutionalization began to take place in the United States starting in the late 1960s and early 1970s. Dramatic changes in perspectives of AAC as a "last resort" have also occurred, and historically clinicians only considered AAC after years of speech therapy when they believed intelligible speech would not develop (Romski & Sevcik, 2005). Further, significant technological advances in the late 20th century and an increased focus on inclusion for people with disabilities also contributed to the greater widespread use of AAC (McNaughton & Light, 2013). The relative youth of the field of AAC relative to other areas of practice in speech-language pathology may be a contributing factor to higher prioritization of training in fluency disorders.

Our study also found substantial variation in the number of credit hours in AAC for programs offering dedicated AAC courses. Increasing the amount of time spent in class can provide additional learning opportunities and allow instructors to incorporate more course features, such as guest lectures or co-instruction with AAC users, hands-on training with AAC tools, or readings by AAC authors, to name only a few. However, many other variables affect student learning, and it may be possible that those in lower credit hour AAC courses learn as much or more than those in higher credit hour courses depending on course features. Student credit hours have been critiqued as an invalid and incomplete measure of student learning (Wellman, 2005), and instead may reflect time served in a course rather than overall learning (Laitinen, 2012; Wellman & Ehrlich, 2003). Further, even the amount of time in class per credit hour can vary across universities. The United States Department of Education attempted to provide minimum standards regarding the amount of work a credit hour represents (Institutional Eligibility Under the Higher Education Act of 1965, as Amended, 2022). Institutions may vary student credit hours in courses depending on rigor of a course, level of instruction, or prerequisites (Wellman, 2005), and universities are permitted to set higher standards than those provided by the Department of Education. In our sample there were differences in how universities defined a credit hour; for example, variation in direct instruction time for a single semester credit hour ranged as high as 845 minutes (The University of Tulsa, n.d.), though multiple other programs used a standard 750

minutes (e.g., St. John's University, n.d.; University of Cincinnati, n.d.). This variation may be one reason that prior studies evaluating AAC coursework have sought to describe the expertise of faculty teaching the courses. However, instructor content expertise may not be necessary to maximize learning outcomes (Peets et al., 2010), and the effects of content versus teaching expertise on learning outcomes from AAC courses has not yet been studied either.

Advanced AAC coursework was only found in a limited number of graduate programs. This was an interesting finding, and further exploration of the course designs for both the standard AAC courses and advanced AAC courses at these programs may be insightful. Given the wide scope of AAC practice including assessment, treatment, coaching of interdisciplinary team members, funding, contemporary issues, and more, it may be difficult to comprehensively address each of these topics and provide experiential learning opportunities in each area even with thirty hours of in-class time. Further, given that most graduate students will go on to become AAC interventionists rather than specialists, perhaps prioritizing treatment and coaching interdisciplinary team members in standard AAC courses may be most relevant to the majority of a graduate student cohort. After completing such a standard AAC course, an advanced AAC course could provide an opportunity for students seeking further training in AAC to gain experiences with assessment, funding, and contemporary issues in the field. Notably, the skills mentioned here may also be addressed through direct clinical experiences.

Significant gaps in the literature continue to exist as it relates to the scholarship of teaching and learning for AAC coursework. Offering an AAC course with sufficient credit hours is only a start, and other factors are likely to impact learning outcomes. Recent work by Da Fonte and colleagues (2022) surveyed 1198 special education teachers from 46 different states and found most special education teachers also did not have field experiences with AAC. They also found having taken an AAC coursework did not result in higher reported levels of knowledge and skills compared to those that did not have AAC coursework. It is possible that the design of the course may have influenced the learning outcomes. Sauerwein and Burris (2022) described AAC coursework using thematic analysis from a survey they distributed to graduate speech-language pathology programs. In their article, they described course design structures, noting variation among programs including face-to-face, hybrid, and online course deliveries. Further, their study described a variety of differences among AAC courses, including learning objectives, content taught, textbooks used, and assessment strategies, all of which may affect student learning outcomes. Their study found that over half of respondents suggested the need to learn assessment and treatment skills by the end of taking an AAC course. How much time is dedicated to each topic and how it is taught in an AAC course has yet to be studied.

Systematic study of AAC class structure features on student learning has only recently been explored. Sanders and colleagues (2022) implemented a flipped classroom AAC course design in which learners were provided lecture materials to be completed outside of class, while in-class time was used to complete learning activities relevant to the topics area for that class. Through semi-structured interviews with thematic analysis, the authors evaluated student perspectives related to course design, course delivery, instructor characteristics, student preferences, student characteristics, online versus in-person learning, and career relevance. Further study of course format is necessary including online synchronous, online asynchronous, in-person, and hybrid

formats. These systematic investigations of the effects of course design features are essential to maximizing academic and clinical preparedness in AAC.

Limitations. While our study adds to the literature describing the state of preservice training in AAC, our study only evaluated academic coursework, and therefore does not describe the depth of preservice training opportunities in AAC at the graduate training level. This study was also not able to identify courses where AAC topics may have been integrated into other courses. Indeed, the programs that responded as not offering a dedicated or combination course reported infusing AAC topics across the curricula and through clinical experiences. As a result, the depth of AAC training may be underreported when considering dedicated or combination course offerings alone. Further research about the efficacy of the approach used in this study may be warranted given that Ratcliff, Koul, and Lloyd (2008) found only 1-3 hours were focused on AAC when it was infused in other courses. This study was also unable to identify whether programs offered graduate clinical practicum experiences in AAC. Unfortunately, many graduate programs listed general practicum titles and course descriptions and did not specify the clinical focus of their clinical practicum experience on their websites. As a result, we could not determine practical experiences in AAC using our methods, and surveys may more accurately capture this information. For example, Johnson and Prebor (2019) found that 98% of responding programs (n = 66) reported that their students received clinical clock hours in AAC during their university practicum.

A further limitation of this study is that the information sources may become quickly outdated as universities make changes to their websites, program, and coursework offerings. While university programs are generally incentivized via student recruitment as well as CAA accreditation standards to maintain accurate course titles and descriptions, it is possible that course content and structure may have changed without updating the course description and/or title. In such cases, a program which did not have a course with an AAC-related title or provide course descriptions with AAC content may have been missed. Additionally, programs which appeared to offer coursework related to AAC may have altered their course offerings such that AAC was not a primary topic discussed in the class.

Future studies may consider collecting and analyzing course syllabi to validate information available on each university website. Although this study adapted methods from Mason and colleagues (2020), future research is warranted to develop an expanded web-analysis protocol. Given the potential of utilizing university course catalogs and websites to study national course offerings, guidelines for future researchers are necessary to ensure valid and reliable methods are used that will promote replicability given the changing nature of course offerings and online resources. Such guidelines may also describe methods for extensive review of course design and coordination with clinical practice. Future studies aiming to examine course offerings using a web-based review are also encouraged to follow up with programs that did not appear to offer a dedicated course. Of the 37 responses received, 25 (67.57%) indicated a course offering that was different than our original code based on the website review alone. This was in part due to ambiguous course names (e.g., seminar), as well as cautious data entry when labeling courses as “combination” (e.g., AAC and Severe Disabilities).

Conclusions

This study described AAC coursework offerings at accredited speech-language pathology graduate programs. Out of 311 graduate programs included in this study, 90.68% offered a dedicated AAC course, while another 5.14% offered AAC in combination with other courses. Of the 282 programs offering a dedicated course, 83.33% required students to complete the course as a graduate requirement. There was considerable variation in credit hours across universities offering dedicated AAC courses ranging from 0.67 to 3 semester credit hours, with the majority offering 3 credit hour courses (55.67%) or 2 credit hours courses (31.56%). The majority of programs which listed the year and term their AAC course was offered did so in the second year of a graduate student's program or later (73.02%). We were able to find advanced AAC coursework offered at only eight university programs.

The results of this study suggest that students from 14.47% of accredited speech-language pathology graduate programs may not be offered or required to complete any AAC coursework at the graduate level, including 45 programs which either only offer an AAC course at the undergraduate level, did not offer a dedicated or combination AAC course, or offer their AAC course as an elective. Further, the variation in credit hours at institutions offering dedicated AAC coursework may result in disparate preparation to serve clients with AAC needs. Finally, graduate programs are urged to consider the timing of when their AAC coursework is offered relative to other coursework given the application of AAC across the lifespan and treatment domains.

The effects of credit hours and other course design features on learning in AAC coursework have not been systematically evaluated. There remains a need to continue to engage in the systematic study of AAC coursework features through scholarship of teaching and learning to improve coursework delivery and preservice training.

The data used in this study is available by request to provide national data for instructors and administrators to help them advocate for change related to AAC coursework offerings at their program. As an example, this data was used by the first author to advocate for increased course credit hours for the AAC course he taught. While the ASHA Standards provide necessary baseline competencies for clinical practice (Council for Clinical Certification in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2018), clinicians for decades have suggested a lack of sufficient preservice training as a substantial barrier to providing high-quality AAC services. Instructors of AAC courses play a critical role in preparing future generations of clinicians to bridge the knowledge and skill gaps that exist in the field of AAC.

These authors support the statement by Sauerwein and Burris (2022) that now is the time for instructors of AAC courses to rise to the challenge of engaging in scholarship of teaching and learning. Instructors of AAC coursework play a critical role in preparing future generations of AAC experts, specialists, and generalists to provide high-quality assessment and treatment services for AAC users. If we are to bridge the practice gaps in AAC that have persisted for decades, we must create a culture of scholarly teaching in AAC to prepare graduate student clinicians more effectively.

Disclosures

Brandon Eddy receives a salary for full time employment at Portland State University, which includes teaching AAC courses. Non-financial disclosures include membership in ASHA and Special Interest Group 12 (AAC), in addition to serving as the Vice President of Science and Education for the Oregon Speech-Language & Hearing Association (OSHA).

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