



# Views of speech pathology educators on a learning resource for cognitive-communication disorders: a user survey of TBIBank Grand Rounds

Elise Bogart<sup>A,\*</sup> , Joanne Steel<sup>B</sup>, Emma Power<sup>C</sup>, Melissa Brunner<sup>A</sup> , Sarah Tran<sup>A</sup>, Davida Fromm<sup>D</sup>, Brian MacWhinney<sup>D</sup> and Leanne Togher<sup>A</sup>

For full list of author affiliations and declarations see end of paper

**\*Correspondence to:**

Elise Bogart  
Faculty of Medicine and Health, The University of Sydney, Sydney, NSW, Australia  
Email: [elise.bogart@sydney.edu.au](mailto:elise.bogart@sydney.edu.au)

**Handling Editor:**

Nicholas Behn

**Received:** 6 August 2024

**Accepted:** 12 January 2025

**Published:** 30 January 2025

**Cite this:** Bogart E *et al.* (2025) Views of speech pathology educators on a learning resource for cognitive-communication disorders: a user survey of TBIBank Grand Rounds. *Brain Impairment* **26**, IB24081. doi:10.1071/IB24081

© 2025 The Author(s) (or their employer(s)). Published by CSIRO Publishing on behalf of the Australasian Society for the Study of Brain Impairment.

This is an open access article distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND)

OPEN ACCESS

## ABSTRACT

**Background.** Cognitive-communication disorders are highly prevalent after traumatic brain injury and have significant impacts on rehabilitation outcomes. TBIBank Grand Rounds was developed as an online multimedia resource to support clinical education about cognitive-communication disorders. The objective of this study was to survey speech pathology educators to establish their views towards TBIBank Grand Rounds. **Method.** An online survey with 37 items was distributed internationally to obtain a cross-section of international educators. The survey consisted of five sections covering (1) participant details; (2) awareness, interest, and use; (3) interface design and delivery; (4) content; and (5) overall impressions. The question formats included yes/no questions, multiple choice options, rating scales, and free text questions. Survey responses were analysed descriptively, with free text supporting interpretation. **Results.** Twenty-five participants completed the online survey. Overall, most users agreed that the design and content of TBIBank Grand Rounds met their needs for supporting education about cognitive-communication disorders. The survey identified high interest but limited prior awareness of the resource. Survey respondents identified useful directions for updates, future enhancements, and dissemination of TBIBank Grand Rounds. **Conclusions.** Incorporating feedback from educators has identified priorities for future enhancements, such as improving cultural diversity. High interest and positive feedback indicate that the TBIBank Grand Rounds is a valuable resource for education about cognitive-communication disorders. However, limited awareness internationally suggests the need for improved dissemination. Enhancing speech pathologists' knowledge about cognitive-communication disorders after TBI may lead to improved clinical care and outcomes.

**Keywords:** assessment, cognition, cognitive-communication, education, evidence-based practice, language, speech pathology, survey, teaching, traumatic brain injury, treatment.

## Introduction

Traumatic brain injury (TBI) is one of the leading causes of death and disability globally (Badhiwala *et al.* 2019; Maas *et al.* 2022). Although the mortality rate following TBI has improved in line with medical advancements, the consequences of TBI are chronic and pervasive (Dams-O'Connor *et al.* 2023). Commonly reported outcomes include poor reintegration into the community with breakdown of existing familial and social relationships and difficulty forming connections, challenges with returning to and maintaining paid employment, and reduced ability to independently carry out activities of daily living and leisure activities (Knox *et al.* 2015; Meulenbroek and Turkstra 2016; Glintborg and Hansen 2021). These devastating outcomes can be partly attributed to cognitive-communication disorder (Elbourn *et al.* 2019; Togher *et al.* 2023b). Cognitive-communication disorder is defined as 'difficulty with any aspect of communication that is affected by disruption of cognition' (College of Audiologists and Speech-Language Pathologists of Ontario 2015), which is most evident in spoken discourse,

such as recounting an event or having a conversation (Steel *et al.* 2021; Avramović *et al.* 2023; Zhang *et al.* 2024). Research has shown that cognitive-communication disorder is a highly prevalent consequence of TBI and persists well beyond the short term, with ongoing impairment found into the chronic phases of recovery (Kelly *et al.* 2023; Togher *et al.* 2023a; Greenslade *et al.* 2024).

A growing number of studies support individualised and evidence-based cognitive-communication intervention that is not only effective in improving communication and spoken discourse outcomes but subsequently results in increased quality of life and a range of positive outcomes in various psychosocial domains for individuals with TBI (Rietdijk *et al.* 2024). Strong evidence supports the role of speech pathology intervention for individuals with TBI across the healthcare continuum, from acute care through to inpatient rehabilitation and community-based interventions (Finch *et al.* 2016; Sohlberg *et al.* 2019; Togher *et al.* 2023a). In order for clinicians to deliver quality assessment and intervention, clinicians working in the field must be intimately familiar with the theoretical evidence-base but also the practical application of this knowledge in clinical settings (Keegan *et al.* 2023). Being able to make successful individualised clinical decisions relies on clinicians possessing an understanding of why particular interventions are effective and efficacious and to critically judge whether these interventions are appropriate for their specific client based on a multitude of factors (Meulenbroek *et al.* 2019; Keegan *et al.* 2023). However, multiple studies have identified that clinicians working in the field of TBI lack confidence, feel unprepared, and lack knowledge in one or more areas of clinical practice relating to the assessment and treatment of cognitive-communication disorders following TBI (Riedeman and Turkstra 2018; Morrow *et al.* 2021). Research has highlighted that limited knowledge and low confidence with discourse analysis methods were key barriers to speech pathologists providing evidence-based practice for cognitive-communication disorders (Frith *et al.* 2014; Maddy *et al.* 2015; Steel *et al.* 2024). A case can therefore be made that there is a need for more consistent and thorough evidence-based training regarding cognitive-communication deficits, both at the graduate level but also for continuing education of clinicians working in the field internationally.

TBIBank Grand Rounds is an online learning platform primarily designed to support education about cognitive-communication disorders resulting from TBI (Elbourn *et al.* 2023). The resource was co-designed by a group of international experts and was released in 2020. It is a freely available resource for registered users of TBIBank, which currently has 315 members from around the world. Registration is free of charge and requires users to provide their name and email address, which can be found at the top of the TBIBank webpage – <https://tbi.talkbank.org/>. TBIBank Grand Rounds is modelled from the success of AphasiaBank Grand Rounds, which is part of the TalkBank

initiative (MacWhinney and Fromm 2022). TBIBank Grand Rounds is organised into eight modules that follow a logical progression of knowledge acquisition and, for consistency, is presented in a similar format to that is used on other TalkBank Grand Rounds resources. That is, each module follows a consistent structure beginning with background information and supporting research evidence, followed by case studies with video and multimedia examples, and finally relevant questions with suggested answers. Examples of the TBIBank Grand Rounds pages can be seen in Supplementary Appendix A1. The design and format of TBIBank Grand Rounds lends itself to case-based learning, an instructional method in which students are encouraged to apply course concepts and theoretical knowledge to problem solve and work through real-world or simulated cases (Donkin *et al.* 2023). Case-based learning has been identified as a preferred method for clinical teaching by both students and educators, and key benefits include improved transition from the classroom to clinical practice, with students learning to critically apply the theoretical evidence-base to practical cases (Shrivastava *et al.* 2024).

The aim of developing the TBIBank Grand Rounds platform was to provide a resource for multiple users across academic and clinical practice with varied purposes, and thus, has been designed for flexible use rather than as a strict curriculum (Elbourn *et al.* 2023). Users have the option of administering TBIBank Grand Rounds as a complete teaching resource or to select one or more modules, or even singular videos, to focus on specific cognitive-communication features or deficits (Elbourn *et al.* 2023). For example, a higher degree educator may select specific cases to illustrate a concept in their curriculum, a student may wish to engage in self-study by reviewing the case descriptions and videos, and a health professional may want to extend their knowledge or obtain an update on current evidence in the field. This degree of flexibility provides the benefit of customising the resource to fit the user's needs. Nonetheless, the initial targeted audience and core group of identified users are higher degree and clinical educators with the subsequent aim of building capacity in student health professionals.

The next step of this project is to incorporate user views. User feedback is an important component of design and enhancement of digital platforms (Regmi and Jones 2020). To date, no research has been conducted on the awareness and use of TBIBank Grand Rounds, how TBIBank Grand Rounds is being utilised by users, or user perspectives on the value of the resource. As a teaching resource, a primary user group of TBIBank Grand Rounds would be speech pathology educators, who are therefore a suitable target group for a survey examining current usage patterns and user perspectives, as well as avenues for potential improvement. To meet these aims, we sought to identify existing survey tools to evaluate digital platforms. A range of tools were identified that focus on different elements of user perspectives, such as

awareness, interest, and use (or future use) of an online resource (Lane *et al.* 2015); evaluation of content, references, background information, moderation and publisher to establish the credibility of the platform (Chan *et al.* 2016); and surveys that evaluate the interface design, learning and teaching features, and skills development components (Coughlan and Morar 2008). Unfortunately, none of these tools on their own met the aims of the present study. Hence, a bespoke survey integrating these concepts was developed to obtain feedback on the TBIBank Grand Rounds from education users and to meet the aims of the current study.

TBIBank Grand Rounds offers an online, evidence-informed multimedia platform to support learning about cognitive-communication disorders after TBI. Speech pathology educators are the primary end users of the platform, and obtaining their feedback on the resource will assist with meeting the core purpose of education.

## Aims

The aim of this study was to survey speech pathology educators to establish their views towards the TBIBank Grand Rounds online learning resource. Specifically, we were interested in four factors:

1. Awareness, interest, and usage patterns
2. Views on interface design and delivery
3. Suitability of the content for education purposes
4. Overall impressions of the resource

## Methods

### Study design

A descriptive cross-sectional international survey design was used to evaluate users views towards the TBIBank Grand Rounds education package. Survey design and reporting were informed by the CROSS checklist (Sharma *et al.* 2021) (Supplementary Appendix A2). This research was approved by the University of Sydney Human Research Ethics Committee (Approval number 2022/547).

### Survey development

A survey consisting of five sections was developed by the research team to meet the specific research aims of this study. Concepts from existing online tool evaluation surveys helped to shape the development of the survey and included consideration of interface design, learning and teaching features, and skills development components (Coughlan and Morar 2008). Evaluation of content, references, background information, moderation, and publisher were also considered (Chan *et al.* 2016). Finally, we also wanted to capture awareness, interest in, and use of the tool (Lane *et al.* 2015). Use included use as intended by the developer

**Table 1.** Survey structure.

TBIBank survey	Response type
1. Participant details	5× multiple choice questions
2. Awareness, interest & use	5× yes/no questions, 2× multiple choice, 5× free text
3. Interface design & delivery	5× Likert, 1× free text
4. Content	8× Likert, 1× free text
5. Overall impressions	1× Likert, 4× free text

of the tool, or modified by the knowledge recipient, as well as initial or routine usage (Lane *et al.* 2015). The survey was piloted by six educators. After initial feedback, minor revisions were made, including changes to wording of questions, and the inclusion of one additional question, with the final survey consisting of 37 items. The survey was open between October and December 2022.

The survey included five sections and a range of response formats as outlined in Table 1. There were no barrier questions. A complete copy of the survey questions can be found in Supplementary Appendix A3.

### Survey dissemination

The survey was disseminated via an online web link using REDCap software (Harris *et al.* 2019). This link was not personalised to any one participant. A participation information statement was incorporated at the start of the survey, with a requirement for consent before proceeding, and an automatic stop action was applied to terminate the survey for any participant who did not provide consent. The recruitment flyers and participant information statement indicated that we were seeking educators who teach speech pathology students in a recognised graduate program and have some experience teaching students about communication disorders that result from TBI. Apart from initial consent, no other questions were compulsory for progression through the survey. All participant data was anonymous and securely captured and stored.

### Participants

Participants were initially recruited via convenience sampling using professional online networks (e.g. BRAINSPaN, AphasiaBank google Groups) and social media platform (e.g. Twitter, Facebook) posts by the research team, with a repeat post at 8 weeks. We invited participation from speech pathology educators in recognised graduate programs, with experience teaching in the subject of communication disorders following TBI. Limited response rates were achieved at 3 weeks through social media and networks. Hence, we sought ethical approval to directly email educators and academics with publicly available email contacts

for purposive sampling. A reminder was sent at 4 weeks after the first contact, and an additional reminder was sent at 8 weeks. All data were captured with the single link. Due to the manner of distribution, the number of eligible potential participants who received the invitation is unknown, and therefore, the authors were unable to calculate response rate. Based on estimates of communication science programs across the US, UK, Australia, and Canada ( $N = 500$ ) that would require an educator with this expertise, we were aiming for a sample size of  $N = 60$  (90% confidence interval, 10% margin of error).

Twenty-eight participants consented to the survey; however, data for three participants were excluded, as no data were entered or the participant only completed the demographic data section and failed to complete the survey items. Demographics for the 25 included participants are summarised in Table 2. We did not specifically collect data on location due to potential identification of participants. However, free text responses indicated representation from at least three different continents. There were no incentives for participation; hence, the risk of multiple participation was deemed very low. As no questions were compulsory, not all participants answered each question, and subsequently, there were missing data for some questions. One of the participants indicated a neutral response for all items in sections 3, 4, and 5; and free text noted lack of familiarity with the resource. Thus, those responses were excluded from the analysis.

## Data analysis

Responses from REDCap were exported into a Microsoft Office Excel spreadsheet for initial screening. Duplicate or invalid responses were removed. Incomplete responses were retained due to the small sample size. Descriptive statistics were used to describe the quantitative data. Free text responses were imported into a spreadsheet for compilation and descriptive analysis. Free text responses were optional and response rates varied as follows: Question 7 ( $n = 16$ ), Question 10 ( $n = 4$ ), Question 12 ( $n = 11$ ), Question 16 ( $n = 9$ ), Question 17 ( $n = 8$ ), Question 23 ( $n = 7$ ), Question 32 ( $n = 5$ ), Question 34 ( $n = 17$ ), Question 35 ( $n = 12$ ), Question 36 ( $n = 12$ ), and Question 37 ( $n = 18$ ). Free text responses were reviewed, and common concepts were grouped together, with the full range of responses being reported. Refer to Supplementary Appendix A4 for details.

## Results

### Aim 1: to establish an understanding of educators' awareness, interest, and use of TBIBank Grand Rounds

Over half of the included participants ( $n = 15/25$ , 60%) indicated they had prior awareness of the TBIBank Grand Rounds education package (Question 8), whereas a further 10 participants (40%) were not aware of the resource. Eleven participants (44%) indicated that they had previously used the resource (Question 11), whereas 14 participants (56%) had not used it. However, all participants ( $n = 25$ , 100%) indicated intention to use the resource in the future (Question 13) and 24 participants (96%) felt that it would be used routinely and frequently in the future (Question 14). Eight participants (32%) indicated that they would use it as designed (i.e. following each module in sequence, Question 15), and another 10 participants (40%) indicated that they would adapt the resource for their own purposes. The remaining seven participants (28%) did not respond to this question.

Seven participants indicated that they heard about the resource through the survey distribution methods. Out of these seven, four participants responded to the questions on the interface (Section 3), three responded on the content (Section 4) and two responded to the overall impressions (Section 5). The remaining three participants had missing data, with participant 25 simply indicating a neutral response on all items and stating, 'I have not used it... no familiarity'.

Eight participants (32%) had heard about TBIBank Grand Rounds (Question 9) from a forum (e.g. conference) and a further eight participants (32%) as part of the current survey methods (e.g. targeted clinical group dissemination). A further six participants (24%) heard about the resource from word-of-mouth and another two from social media (8%). Other sources included research collaborations/networks ( $n = 1$ , 4%) and research supervisors ( $n = 2$ , 8%). The resource had been used in various curriculum units (Question 12) including cognitive-communication units, adult neurogenic language, research, clinical, neuro-anatomy, and linguistics. Participant 5 elaborated on their use with the following quote: 'Students were assigned a case from the Grand Rounds section of the TBIBank website, and they were asked to watch the video and answer questions related to spoken discourse characterization and analysis.'

**Table 2.** Participant demographics ( $n = 25$ ).

Gender distribution	Age bracket	Qualifications	Years of teaching	Teaching cohorts
Women: 16	20–40 years: 10	PhD: 19	1–5 years: 8	Undergraduate: 3
Men: 7	41–70 years: 15	Master's: 4	6–10 years: 3	Master's: 6
Undisclosed: 2		Undergraduate: 2	11+ years: 14	Both: 16

The case was then [used] for class discussion.’. Although the survey was targeted at classroom education, some of the feedback indicated use outside of the classroom for research or clinical applications. For example, Participant 2 indicated, ‘I have the students do some of the grand rounds as preparatory work before we discuss the data they will be analysing’, and Participant 5 indicated, ‘I have also used videos from the website to train students in clinical settings’. Responses indicated that users primarily adapted the resource to align with the learning objectives of their units, as evidenced by Participant 3’s statement: ‘Used the videos predominantly and adapted available activities to reflect the learning objectives of the unit I was/am teaching’. Two other users indicated the need for language or cultural adaptation, as indicated by Participant 10, ‘I do not teach in English. Therefore, most elements needed translation for my slides and cases needed to be my own and not the ones in the TBIBank Grand Rounds.’. Participants also commented on perceived usefulness and benefits for student learning in addition to a desire to see the tool more widely

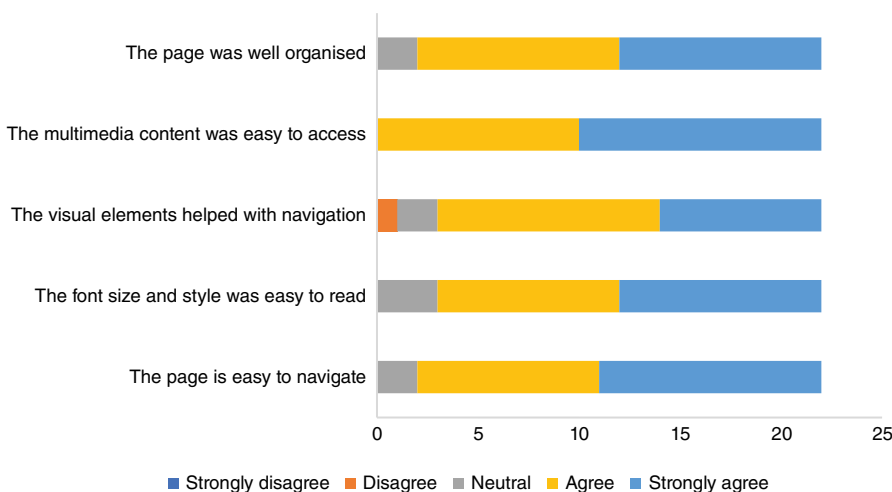
**Table 3.** Other educational resources.

Evidence-based resources (databases/clinical guidelines) e.g. speechBITE, American Congress of Rehabilitation Medicine Cognitive rehabilitation guidelines, American Speech-Language Hearing Association evidence maps
Expert webpages: e.g. ABI Communication Lab, Mark Ylvisaker
Targeted evidence-based resources (e.g. TBI Express, TBIconneCT, Social Brain Toolkit, social-ABI-lity, convers-ABI-lity)
Outcome measures: The Center for Outcome Measurement in Brain Injury
Other TalkBank Grand Rounds (e.g. AphasiaBank, RHDBank)
Clinical Simulation resources: Simucase
Other: Neuroanatomy websites, podcasts, blogs (e.g. <a href="http://www.tbistafftraining.info/">http://www.tbistafftraining.info/</a> )
Other online resources focused on personal experiences (e.g. YouTube videos, True Life documentary, Broken documentary series)

used, as expressed by Participant 5: ‘Instructors teaching cognitive-communication disorders should know about this incredibly helpful resource as there are very little teaching resources available. Students appreciate having video examples to watch and learn about the nature of communication challenges associated with TBI’. Participants also made links to other complementary Grand Rounds, such as AphasiaBank and RHDBank (MacWhinney and Fromm 2023). One of the questions in this section asked about any other existing online resources used to support teaching on cognitive-communication disorders (Question 7). Sixteen participants responded, with many participants indicating the same resource/s, as listed in Table 3.

**Aim 2: to obtain feedback on the interface design and delivery of the TBIBank Grand Rounds**

As seen in Fig. 1, 20 participants out of 22 valid responses (91%) either strongly agreed or agreed that the TBIBank page was easy to navigate (Question 18), with two participants (9%) neutral on ease of navigation. Free text responses of Participant 9 provided some deeper insights into navigation, ‘it would be nice to be able to directly navigate to the different modules; there is a lot of content on one page...’. A similar pattern was found with font size and style (Question 19), where most participants ( $n = 19/22$ , 86%) either strongly agreed or agreed that it was easy to read with a further three (14%) neutral responses. Nineteen participants from 22 valid responses (86%) also strongly agreed or agreed that the visual elements helped with navigation (Question 20) and, although another two participants (9%) were neutral, one participant (5%) disagreed with this statement. Access to the multimedia (Question 21) was perceived as easy by most participants ( $n = 22/23$ , 96%), and 20 participants ( $n = 20/22$ , 91%) reported that the page was well organised (Question 22), with three (9%) neutral responses on organisation. Free text comments on interface design and delivery (Question 23) offered helpful



**Fig. 1.** Interface feedback.

suggestions, such as providing a single page per module; changing the colour of the headings; adding in shortcuts, such as a quick links menu; and having a drop-down or hide/reveal option for each of the modules and/or questions/answers. Participants also requested clearer information on sharing permissions (e.g. terms of use), as explained by Participant 10, ‘I often think it would be good to give them access to the TBIBank Grand Rounds, but since I do not know if that is allowed, I have not done that yet’.

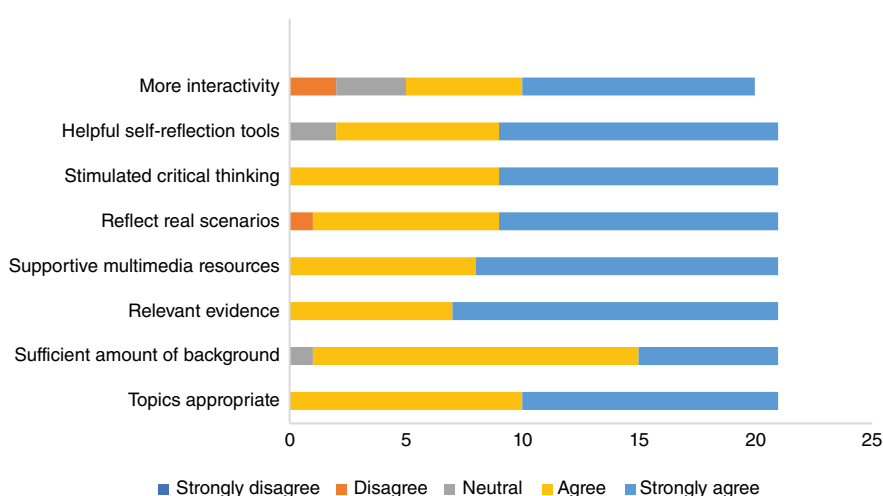
### Aim 3: to establish if the content of the TBIBank Grand Rounds meets the educators’ teaching needs

As visualised in Fig. 2, all participants ( $n = 21/21$ , 100%) either agreed or strongly agreed on the following Likert scales: the appropriateness of the topics in the Grand Rounds (Question 24), integration of relevant evidence (Question 26), the support provided by the multimedia (Question 27), and stimulation of critical thinking (Question 29). Sufficient background information on the cases (Question 25) was a point of strong agreement or agreement for most participants ( $n = 20/21$ , 95%) and neutral for one participant (5%). Most participants also ( $n = 20/21$ , 95%) agreed or strongly agreed that the cases reflected real case scenarios (Question 28). One participant (5%) disagreed with the statement that the cases reflected real cases. The self-reflection tool was viewed as helpful (Question 30) for most of the participants ( $n = 19/21$ , 90%) with two participants ( $n = 2/21$  10%) neutral on this item. Fifteen participants ( $n = 15/20$ , 75%) either agreed or strongly agreed that it would be useful to have a tool to increase interactivity in the Grand Rounds (Question 31), with one missing response for this item. Another three participants remained neutral (15%), and two participants (10%) did not feel this was required, indicating disagreement. The free text question in this content section (Question 32) highlighted a desire for more background information on cases and videos with examples of intervention strategies.

One participant who disagreed with the need for more interactivity commented that shared commentary could be adequately facilitated in the classroom setting.

### Aim 4: to establish an understanding of educators’ overall impressions of TBIBank Grand Rounds

Fifteen of the 25 participants (60%) agreed or strongly agreed that the education package was a valuable teaching resource (Question 33). Six participants selected ‘Strongly disagree’ on this item. However, the free text responses for these specific participants indicated positive comments overall, and all six participants who selected this option indicated that they would recommend the resource. This apparent inconsistency is explained further in the discussion in relation to survey design. Participant 3 commented, ‘Grand Rounds for students has been really helpful for teaching cog-comm features and characteristics. The videos are a priceless resource and I like that there are supporting questions’. Seventeen users out of 18 valid responses (94%) indicated that they would recommend this resource (Question 37), with one participant (6%) indicating ‘no familiarity yet’. The most useful aspects of the resource (Question 34) the participants identified were the video content, the questions, case content, and clinical evidence. Value as a case-based learning resource was exemplified by Participant 23: ‘I have used the resources as case study examples to facilitate discussion and practice for treatment planning and goal writing’. Participant 10 commented, ‘The section of differential diagnosis to people with other communication disorders. I find that students often struggle with that and having cases telling the same story very differently is illustrative’. Several participants also commented on their perceptions of the student experience, as demonstrated by Participant 14: ‘My students valued the videos’. Aspects that were least helpful (Question 35) to the participants were the username/password restrictions, the large volume of text, and some elements of the interface, such as



**Fig. 2.** Content feedback. Refer to Supplementary Appendix A3 for complete wording of survey questions.

having all information on a single page. Suggestions offered by the participants to improve the resource (Question 36) included elements that can be readily changed, such as improving interface elements, increased interactive opportunities, and increasing cultural responsiveness. Participant 23 explained, 'While there is flexibility to add a discussion about culture, it was lacking within the modules'. A further suggestion was to add more background to the clinical cases, as requested by Participant 5: 'It would be helpful to provide more background information on the case (e.g. medical history, detailed cognitive test scores) to go along with their communication profiles'. Other suggestions will require additional resources and included the addition of acute/early phase videos, concussion/mild TBI cases, less structured discourse samples, paediatric cases, intervention examples, and translation into other languages. For example, Participant 22 stated, 'Some videos of the intervention strategies being implemented would be helpful', and Participant 4 noted, 'It would be nice to have less structured dyadic or group conversations'.

## Discussion

The aim of this study was to survey speech pathology educators to establish their views towards the TBIBank Grand Rounds online learning resource. This online resource was designed to be a flexible education resource to support evidence-based education about cognitive-communication deficits after TBI. Specifically, we sought feedback from primary end users, that is, speech pathology educators, regarding their awareness of, interest in, and use of the resource; the interface design and delivery; the content; and overall impressions. Although interest in use of the resource was high, we identified the need for increased international awareness of TBIBank Grand Rounds. Overall, most users agreed that the design and content of TBIBank Grand Rounds met their needs for education. Nonetheless, feedback from the end users identified useful directions for updates and future enhancements. Overall, results suggest that the resource was perceived as highly useful for speech pathology educators.

The initial survey questions around awareness, interest, and use (Aim 1) highlighted limited awareness of the resource at an international scale and the value of forums and clinical groups for facilitating resource-sharing. Founding a community of practice in this field could be a potential future direction that may support this preference for resource-sharing. Moreover, webpage activity monitoring could support evaluation of dissemination methods. Additionally, survey respondents' strong indications that they would use TBIBank Grand Rounds in the future highlighted that further enhancement of this resource is a worthwhile endeavour. An interesting finding was the range of education purposes for which this content was applicable,

which extended beyond the anticipated scope of cognitive-communication units in speech pathology curricula to units on research and clinical education, neuroanatomy, and linguistics. The depth of focus on cognitive-communication disorders across various courses and institutions may also influence uptake of the resource. The ability to use the resource flexibly appears to be a key factor that facilitated a wide scope of use. Additionally, it was helpful to compile a list of other online resources utilised by the participants to further resource-sharing, which is aligned with sustainability and capacity building efforts (Sommer *et al.* 2023).

In response to questions around interface design and navigation (Aim 2), educators provided helpful usability feedback to guide updates of the TBIBank Grand Rounds resource. The interface design and navigation were rated highly overall, but the addition of elements, such as quick links, drop-down menus, and revised colour schemes, were suggested to enhance the navigation experience. Example screenshots of these updates can be viewed in Supplementary Appendix A1. In this section, one of the users commented on wanting clearer direction on sharing permissions and/or terms of use, which could potentially be achieved with an additional description and the use of integrated icons throughout the page. A terms of use summary has also been communicated on social media platforms (Supplementary Appendix A5). Most of the interface design and navigation update suggestions require minimal resources and would potentially enhance the users' experience with the resource.

The section evaluating the user's perception of the content (Aim 3) in the TBIBank education package highlighted that, overall, the topics were perceived as appropriate, relevant evidence was included, the multimedia aligned well with the content, and the topics stimulated critical thinking. A small number of responses indicated a desire for more background information on the clinical cases and more authenticity in the case background (i.e. reflecting real case scenarios). Additionally, a small number of participants were less interested in the self-reflection tools and did not feel the need for further interactivity, which may reflect the varied contexts in which the resource is utilised. Participants suggested that the addition of videos demonstrating intervention approaches would be useful.

Overall, free text comments (Aim 4) highlighted that the education package was perceived as a valuable learning platform for communication disorders associated with TBI and would recommended it to others. Although six participants selected strongly disagree on this item, the free text responses for these participants indicated positive comments overall, and all these participants indicated that they would recommend the resource, which may have indicated error in interpretation of the direction of the Likert scale. Subsequently, the form was reviewed, and it was observed that the vertical presentation of this item may have made it challenging for users to correctly interpret the item,

which unfortunately was not an issue identified in the initial piloting. Comparison with the participants' other responses suggested that these participants were happy with most elements of the resource, further supporting the notion that this item may have been misinterpreted by some of the participants with the presentation on the online survey.

The components of the education package that were reported as most useful were the video content, the case scenarios, case-based questions, and the integrated clinical evidence. These findings reinforce the utility of the TBIBank Grand Rounds for online education about cognitive-communication disorders of TBI. Conversely, participants indicated that the username/password was somewhat restrictive. Registration and approval are necessary for adherence to human subjects research guidelines and TalkBank ground rules. However, the system for accessing these resources has recently changed, so that individual users now register with their email address and a password of their choosing. This may improve the access experience for users. Participants also commented that text could be condensed in some sections and potentially improved with addition of key points. Other updates and future directions for the resource that were raised by participants were increased cultural variability in the cases, the inclusion of acute/early phase videos, addition of concussion/mild TBI, less structured dyadic or group conversations, paediatric case examples, and translation into other languages. Although these advances would require more resources, there is a clearly identified need, which would justify ongoing expansion and development of TBIBank Grand Rounds.

TBIBank Grand Rounds could offer a useful model for other learning platforms in healthcare education, particularly with increasing online learning approaches post-pandemic (Adedoyin and Soykan 2023). Results also highlight features that higher educators may want more broadly in an online or case-based education resources, such as sufficient background for case scenarios and tasks that stimulate critical thinking. Additionally, the survey established for the current study was developed due to the absence of an existing tool to evaluate multiple domains of an online case-based education package. Hence, the survey could be considered for future research with psychometric evaluation and adaptation to other online platforms. Aspects of the survey could also be used as a checklist in design of future online platforms.

### Limitations and future directions

In the present study, country of origin was not captured in the demographics due to potential identification of individual responses. Hence, it was unclear if the responses were reflective of a global audience. Nonetheless, some of the responses indicated influences from regions with cultural

and linguistic variation on at least three continents. Unfortunately, the survey did not reach the anticipated sample size despite efforts to extend the project timeline. Therefore, results should be interpreted with caution due to the small sample size. Furthermore, we were unable to identify an existing survey with validated psychometric data to meet the project aims. Moreover, there may be sample bias with people who have a high interest in TBI and cognitive communication being more likely to respond to the survey. As 56% of the sample had not used the resource, some of the responses may have also reflected planned future use rather than actual experience of applying the resource in an education context with students. Additionally, one of the items was potentially misinterpreted by multiple participants, so consideration of this is important for future online surveys. Although the survey was targeted at classroom educators in a recognised graduate program, some of the feedback indicated applications outside of the classroom. A logical step forward identified by the current project is updating and expanding the resource followed by further dissemination. Past dissemination has included conference presentations and X/Twitter. The current study has highlighted the need for a targeted dissemination plan (Supplementary Appendix A6) and evaluation of other user groups, including feedback from people with lived experience and clinical educators. Evaluation from a larger sample as well as a wider range of users, such as students or educators, in related health disciplines would be a useful avenue. Adaptation and psychometric evaluation of the survey for use with a range of online resources or other Grand Rounds could be another useful direction.

### Conclusions

The TBIBank Grand Rounds was developed to support educational initiatives around cognitive-communication disorders after TBI. Incorporating feedback from speech pathology educators as primary end users has provided novel insights into enhancing the existing digital resource and identifying priorities for future enhancements. Results have highlighted a strong need for further dissemination, refinement, and expansion of this resource. Future directions could examine the broader impact of the tool from the student-learner perspective. The bespoke survey we developed to evaluate this resource may, with some adaptation and psychometric testing, offer a useful model and/or resource for evaluating other digital resources in the future. The TBIBank Grand Rounds resource has potential to build international capacity for evidence-based management of cognitive-communication disorders after TBI. In turn, enhancing speech pathologists' knowledge about this topic may lead to improved clinical care and outcomes for people affected by cognitive-communication disorders after TBI.



## Supplementary material

Supplementary material is available [online](#).

## References

- Adedoyin OB, Soykan E (2023) Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments* 31(2), 863–875. doi:10.1080/10494820.2020.1813180
- Avramović P, Rietdijk R, Kenny B, Power E, Togher L (2023) Developing a digital health intervention for conversation skills after brain injury (convers-ABI-lity) using a collaborative approach: mixed methods study. *Journal of Medical Internet Research* 25, e45240. doi:10.2196/45240
- Badhiwala JH, Wilson JR, Fehlings MG (2019) Global burden of traumatic brain and spinal cord injury. *The Lancet Neurology* 18(1), 24–25. doi:10.1016/S1474-4422(18)30444-7
- Chan TM, Thoma B, Keeth Krishnan ML, Carpenter CR, Astin M, Kulasegaram K (2016) Derivation of two critical appraisal scores for trainees to evaluate online educational resources: a METRIQ study. *Western Journal of Emergency Medicine* 17(5), 574. doi:10.5811/westjem.2016.6.30825
- College of Audiologists and Speech-Language Pathologists of Ontario (2015) Practice standards and guidelines for acquired cognitive communication disorders. College of Audiologists and Speech-Language Pathologists of Ontario. Available at [https://www.caslpo.com/sites/default/uploads/files/PSG\\_EN\\_Acquired\\_Cognitive\\_Communication\\_Disorders.pdf](https://www.caslpo.com/sites/default/uploads/files/PSG_EN_Acquired_Cognitive_Communication_Disorders.pdf)
- Coughlan J, Morar SS (2008) Development of a tool for evaluating multimedia for surgical education. *Journal of Surgical Research* 149(1), 94–100. doi:10.1016/j.jss.2007.09.015
- Dams-O'Connor K, Juengst SB, Bogner J, Chiaravalloti ND, Corrigan JD, Giacino JT, Harrison-Felix CL, Hoffman JM, Ketchum JM, Lequerica AH (2023) Traumatic brain injury as a chronic disease: insights from the United States traumatic brain injury model systems research program. *The Lancet Neurology* 22(6), 517–528. doi:10.1016/S1474-4422(23)00065-0
- Donkin R, Yule H, Fyfe T (2023) Online case-based learning in medical education: a scoping review. *BMC Medical Education* 23(1), 564. doi:10.1186/s12909-023-04520-w
- Elbourn E, Kenny B, Power E, Togher L (2019) Psychosocial outcomes of severe traumatic brain injury in relation to discourse recovery: a longitudinal study up to 1 year post-injury. *American Journal of Speech-Language Pathology* 28(4), 1463–1478. doi:10.1044/2019\_AJSLP-18-0204
- Elbourn E, MacWhinney B, Fromm D, Power E, Steel J, Togher L (2023) TBIbank: An international shared database to enhance research, teaching and automated language analysis for traumatic brain injury populations. *Archives of Physical Medicine and Rehabilitation* 104(5), 824–829. doi:10.1016/j.apmr.2022.12.192
- Finch E, Copley A, Cornwell P, Kelly C (2016) Systematic review of behavioral interventions targeting social communication difficulties after traumatic brain injury. *Archives of Physical Medicine and Rehabilitation* 97(8), 1352–1365. doi:10.1016/j.apmr.2015.11.005
- Frith M, Togher L, Ferguson A, Levick W, Docking K (2014) Assessment practices of speech-language pathologists for cognitive communication disorders following traumatic brain injury in adults: An international survey. *Brain Injury* 28(13–14), 1657–1666. doi:10.3109/02699052.2014.947619
- Glintborg C, Hansen TGB (2021) Psychosocial sequelae after acquired brain injury: A 5-year follow-up. *Nordic Psychology* 73(2), 119–135. doi:10.1080/19012276.2020.1817769
- Greenslade KJ, Bogart E, Gyory J, Jaskolka S, Ramage AE (2024) Story grammar analyses capture discourse improvement in the first 2 years following a severe traumatic brain injury. *American Journal of Speech-Language Pathology* 33(2), 1004–1020. doi:10.1044/2023\_AJSLP-23-00269
- Harris P, Taylor R, Minor B, Elliott V, Fernandez M, O'Neal L, McLeod L, Delacqua G, Delacqua F, Kirby J, Duda S (2019) The REDCap consortium: Building an international community of software partners. *Journal of Biomedical Informatics* 95, 103208. doi:10.1016/j.jbi.2019.103208
- Keegan LC, Hoepner JK, Togher L, Kennedy M (2023) Clinically applicable sociolinguistic assessment for cognitive-communication disorders. *American Journal of Speech-Language Pathology* 32(2S), 966–976. doi:10.1044/2022\_AJSLP-22-00102
- Kelly C, Cornwell P, Hewetson R, Copley A (2023) The pervasive and unyielding impacts of cognitive-communication changes following traumatic brain injury. *International Journal of Language & Communication Disorders* 58(6), 2131–2143. doi:10.1111/1460-6984.12923
- Knox L, Douglas JM, Bigby C (2015) The biggest thing is trying to live for two people': Spousal experiences of supporting decision-making participation for partners with TBI. *Brain Injury* 29(6), 745–757. doi:10.3109/02699052.2015.1004753
- Lane JP, Stone VI, Nobrega A, Tomita M (2015) Level Of Knowledge Use Survey (LOKUS): A validated instrument for tracking knowledge uptake and use. *Studies in Health Technology and Informatics* 217, 106–110. doi:10.3233/978-1-61499-566-1-106
- Maas AI, Menon DK, Manley GT, Abrams M, Åkerlund C, Andelic N, Aries M, Bashford T, Bell MJ, Bodien YG (2022) Traumatic brain injury: progress and challenges in prevention, clinical care, and research. *The Lancet Neurology* 21(11), 1004–1060. doi:10.1016/S1474-4422(22)00309-X
- MacWhinney B, Fromm D (2022) Language sample analysis with TalkBank: an update and review. *Frontiers in Communication* 7, 865498. doi:10.3389/fcomm.2022.865498
- MacWhinney B, Fromm D (2023) Collaborative commentary for understanding communication disorders. *American Journal of Speech-Language Pathology* 32(5S), 2580–2588. doi:10.1044/2023\_AJSLP-22-00385
- Maddy K, Howell D, Capilouto G (2015) Current practices regarding discourse analysis and treatment following non-aphasic brain injury: a qualitative study. *Journal of Interactional Research in Communication Disorders* 6(2), 211–236. doi:10.1558/jircd.v7i1.25519
- Meulenbroek P, Turkstra LS (2016) Job stability in skilled work and communication ability after moderate-severe traumatic brain injury. *Disability & Rehabilitation* 38(5), 452–461. doi:10.3109/09638288.2015.1044621
- Meulenbroek P, Ness B, Lemoncello R, Byom L, MacDonald S, O'Neil-Pirozzi TM, Moore Sohlberg M (2019) Social communication following traumatic brain injury part 2: identifying effective treatment ingredients. *International Journal of Speech-Language Pathology* 21(2), 128–142. doi:10.1080/17549507.2019.1583281
- Morrow EL, Turkstra LS, Duff MC (2021) Confidence and training of speech-language pathologists in cognitive-communication disorders: time to rethink graduate education models? *American Journal of Speech-Language Pathology* 30(2S), 986–992. doi:10.1044/2020\_AJSLP-20-00073
- Regmi K, Jones L (2020) A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education. *BMC Medical Education* 20, 91. doi:10.1186/s12909-020-02007-6
- Riedeman S, Turkstra L (2018) Knowledge, confidence, and practice patterns of speech-language pathologists working with adults with traumatic brain injury. *American Journal of Speech-Language Pathology* 27(1), 181–191. doi:10.1044/2017\_AJSLP-17-0011
- Rietdijk R, Brunner M, Conroy P, Jayes M, Togher L (2024) It's a changing landscape: Complexity and innovation in cognitive-communication rehabilitation for people with acquired brain injury (ABI). *International Journal of Language and Communication Disorders* 59, 429–432. doi:10.1111/1460-6984.13022
- Sharma A, Minh Duc NT, Luu Lam Thang T, Nam NH, Ng SJ, Abbas KS, Huy NT, Marušić A, Paul CL, Kwok J, et al. (2021) A Consensus-based Checklist for Reporting of Survey Studies (CROSS). *Journal of General Internal Medicine* 36(10), 3179–3187. doi:10.1007/s11606-021-06737-1
- Shrivastava SR, Shrivastava PS, Borkar S, Trivedi S (2024) Transforming medical training through online case-based learning: brief review. *Journal of Pharmacy and Bioallied Sciences* 16(Suppl 2), S1101–S1103. doi:10.4103/jpbs.jpbs\_1243\_23

- Sohlberg MM, MacDonald S, Byom L, Iwashita H, Lemoncello R, Meulenbroek P, Ness B, O'Neil-Pirozzi TM (2019) Social communication following traumatic brain injury part I: state-of-the-art review of assessment tools. *International Journal of Speech-Language Pathology* 21(2), 115–127. doi:10.1080/17549507.2019.1583280
- Sommer CL, Crowley CJ, Moya-Galé G, Adjassin E, Caceres E, Yu V, Coseteng-Flaviano K, Obi N, Sheeran P, Bukari B, et al. (2023) Global partnerships to create communication resources addressing sustainable development goals 3, 4, 8, 10, and 17. *International Journal of Speech-Language Pathology* 25(1), 167–171. doi:10.1080/17549507.2022.2130430
- Steel J, Elbourn E, Togher L (2021) Narrative discourse intervention after traumatic brain injury: a systematic review of the literature. *Topics in Language Disorders* 41(1), 47–72. doi:10.1097/TLD.0000000000000241
- Steel J, Coluccio I, Elbourn E, Spencer E (2024) How do speech–language pathologists assess and treat spoken discourse after TBI? A survey of clinical practice. *International Journal of Language & Communication Disorders* 59(2), 591–607. doi:10.1111/1460-6984.12784
- Togher L, Douglas J, Turkstra LS, Welch-West P, Janzen S, Harnett A, Kennedy M, Ailene K, Patsakos E, Ponsford J, Teasell R, Bayley M, Wiseman-Hakes C (2023a) INCOG 2.0 guidelines for cognitive rehabilitation following traumatic brain injury, part IV: cognitive-communication and social cognition disorders. *The Journal of Head Trauma Rehabilitation* 38(1), 65–82. doi:10.1097/HTR.0000000000000835
- Togher L, Elbourn E, Kenny B, Honan C, Power E, Tate R, McDonald S, MacWhinney B (2023b) Communication and psychosocial outcomes 2-years after severe traumatic brain injury: Development of a prognostic model. *Archives of Physical Medicine and Rehabilitation* 104(11), 1840–1849. doi:10.1016/j.apmr.2023.04.010
- Zhang E, Steel J, Fromm D, MacWhinney B, Togher L, Bogart E (2024) Insights from important event recounts told by people with traumatic brain injury. *Journal of Speech, Language and Hearing Research* 67(9), 3064–3080. doi:10.1044/2024\_JSLHR-23-00595

**Data availability.** The data that support this study will be shared upon reasonable request to the corresponding author.

**Conflicts of interest.** All authors declare no conflicts of interest.

**Declaration of funding.** Funding for this project was provided by the University of Sydney Equity Prize SEED Grant. TBIBank is supported by funding from the National Health and Medical Research Council (NHMRC #632681) and the National Institute on Deafness and other Communication Disorders (NIDCD #DC008524).

**Ethics.** The author/s asserts that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013.

#### Author affiliations

<sup>A</sup>Faculty of Medicine and Health, The University of Sydney, Sydney, NSW, Australia.

<sup>B</sup>School of Health Sciences, The University of Newcastle, Callaghan, NSW, Australia.

<sup>C</sup>Graduate School of Health, University of Technology Sydney, Sydney, NSW, Australia.

<sup>D</sup>Department of Psychology, Carnegie Mellon University, Pittsburgh, PA, USA.