The SWANs/ABLES Project: A set of resources developed collaboratively with teachers to support the teaching and learning of students with additional learning needs

Toshiko Kamei

Assessment Research Centre, University of Melbourne

Toshiko is a research fellow at the Assessment Research Centre. Her work has focused on projects to investigate the assessment and recognition of complex competencies in school-age students and adults. For instance, she has led projects that aims to develop resources to assess foundational skills in students with disability. Prior to her time at the Centre, she taught in primary, secondary and specialist settings in Canada, England, Japan, and Australia. Toshiko's research interests include assessment of complex competencies, measurement theory, and raising the capacity of teachers to educate all students.

Abstract

The inclusion of students with additional learning needs in schooling is part of policy and practice in Australia. However, it has been well documented that teachers lack the resources and training to meaningfully include students with additional learning needs in the full range of learning in their classrooms. The SWANs program of work aimed to fill this gap through the development of assessments based on learning progressions that provide teachers with targeted information to support the teaching and learning of all students including students with additional learning needs. The development and implementation of the SWANs/ABLES suite of resources illustrates how a practical assessment tool can support teachers to target the learning of students with additional learning needs regardless of their point of readiness to learn.

Introduction

Policies in Australian state education departments support the inclusion of students with additional learning needs in mainstream schools (e.g., Victorian Department of Education and Training) and the responsibility to implement policy into practice lies with teachers (Sharma et al., 2012). However, teachers can lack the skills, resources and training to meaningfully include students with additional learning needs in classrooms (Senate Standing Committee on Education and Employment [Senate Committee], 2016; Victorian Equal Opportunity & Human Rights Commission [VEOHRC], 2012). The SWANs program of work aimed to fill this gap in knowledge through the development of assessments based on learning progressions that provide teachers with targeted information to support the teaching and learning of all students including students with complex learning needs.

Research and development

Assessments based on learning progressions can be used to provide teachers with information about what a student knows and what a student is ready to learn next to progress. An underlying assumption of learning progressions is that the skill to be measured can be structured in a way that describes increasing proficiency in skills and knowledge as students learn and develop. Thus, rather than describing a can/cannot do conclusions about outcomes, assessments based on learning progressions aim to infer a student's level of achievement on a developmental continuum.

The program of work called the Students with Additional Needs (SWANs) began in 2007 and was developed through two Australian Research Council Linkage grants in partnership with the Victorian Department of Education and Training.

SWANs applied a method developed by Griffin (2007) that combined the work of Vygotsky (1980), Glaser (1981) and Rasch (1960) to build assessments based on learning progressions. Griffin (2007) equated the Zone of Proximal Development that describes a range of learning proficiency at which a student can progress with the support of a more capable other (Vygotsky, 1980) to the point at which a student has a 0.50 chance of achieving a skill described in terms of criteria of success. In the Rasch model (Rasch, 1960), this point is estimated to be where the ability of the person is equal to the difficulty of the task. The work of Glaser (1981) on criterion-referenced interpretation of student performance was applied to describe students in terms of what they can do against criteria of performance quality.

This program of work aimed to expand the general curriculum to describe learning from a pre-intentional stage of learning to a stage where students are able to independently learn. In this way, it took a strength-based approach to describe students in terms of what they can do, regardless of their starting point for learning. Its intention is not to replace the curriculum but to extend it to facilitate access of all students to the general curriculum. In this way, it described emergent levels of learning in the following learning domains that were judged to be foundational skills for learning:

- Communication: the development of functional communication skills, building towards the use and understanding of social expectations about communication (Woods, 2010).
- Literacy: the development of the ability to make and interpret meaning using symbols (including pictures, signs, numbers, and text) leading towards early reading and writing (Woods, 2010).
- Digital Literacy: the development of the ability to interpret and use the language, symbols, and tools of digital technologies in a culturally appropriate manner. This includes learning to use technologies and using technologies to learn (White et al., 2017).
- Numeracy: the development of skills needed to notice, describe, understand and use numeracy information, including number and its operations, shape and pattern (Strickland et al., 2016).
- Social Processes: the development of skills to support social interaction, social responsibility, and a capacity to transcend social difficulties. These are the skills that help a student to learn both from and with others (Coles-Janess & Griffin, 2009).
- Emotional Understanding: the development of understanding about the experience and expression of emotions in self and others (Roberts, 2014).
- Learning Skills: the development of skills related to attention, memory, and executive functioning in school and classroom interactions, and that help students become more active and independent learners (Roberts, 2014).
- Thinking Skills: the development of strategies to actively participate in learning by using trial and error, evaluating outcomes, categorising, initiating activities and making choices. This leads to the development of skills involved in critical thinking such as predicting, planning, evaluating, and monitoring progress (Kamei, 2019).
- Movement: the development of the ability to achieve goals through strategic use of the movement capabilities of the body, enhancing agency, participation, and independence (Gale, 2018).

Initial framework development

The method to develop the assessment frameworks applied principles of validity based on the seminal work of Messick (1989) and employed procedures described by Wolfe and Smith (2007a, 2007b) and Wilson (2005).

The structure of the assessment frameworks was hierarchical. It involved defining the construct, or the skill to be measured. The construct was then broken down into strands that describe broad categories that are critical to the construct and further into capabilities to describe key skills within each of the strands. Indicators were then developed for each of the capabilities that are an indicative sample of a student's competence described as behaviours that students do, say, make or write. These were then further broken down into quality criteria that describe how well students can demonstrate competence in each indicator. This method of breaking the construct down into increasingly detailed levels of manifestation helped to ensure that the resulting assessment described the construct defined in the first step (Wilson, 2005).

A review of research was carried out to develop an initial theoretical assessment framework for each of the assessments consisting of a construct, capabilities, strands, indicators and quality criteria.

Collaboration with teachers

One important principle underlying the development of SWANs was that it was a tool for all teachers rather than specialists. Thus, an important aspect of development was the co-design process in collaboration with teachers. This phase of the methodology involved series of workshops with subject matter experts (SMEs) who were teachers experienced in the teaching and learning of students with additional learning needs.

The SMEs reviewed the initial theoretical frameworks. They modified the initial framework and drafted additional indicators and quality criteria to reflect what the skills would look like in an educational setting in language that was accessible to all teachers. This process of review and drafting of a pool of items ensured the assessments were interpretable and practical for all teachers and did not require specialist expertise. Moreover, it fostered a sense of shared ownership of the developed resources.

Large-scale field trial

In the next phase, large-scale field trials were carried out to collect student assessment data. The indicators were written as question stems and quality criteria as response options. This provided a set of questions in observation-based multiple-choice format for teachers to respond to based on their knowledge of their students accumulated through their regular interactions with them. Thus, students were not required to sit tests or to carry out specific tasks. Judgements of competence were made by teachers using their stored knowledge of students to choose responses based on evidence of what their students typically do, say, make or write.

The data were analysed using the Rasch partial credit model (Masters, 1982) to check the technical quality of the assessments. Estimates of difficulty were used to empirically order the quality criteria from lower to higher levels of difficulty. This information was used to derive a learning progression based on student assessment data.

SMEs were called on to review the empirically derived learning progression. They provided judgement as to where the key transitions were as students progressed in the domains of learning. This step ensured that the resulting level statements described transitions that would be useful to teachers for planning their teaching and instruction. SMEs focused on recognising transitions that were observable key transitions that were useful for teachers as students progress from one level of learning to another. These were used as the basis to write level statements for the learning progressions.

Instructional strategies

In the final step, SMEs were drawn on to review and write evidence-based instructional strategies mapped to each level of learning in the learning progressions to progress students from one level of learning to the next. Series of workshops took place where SMEs were presented with case studies of students and asked to make judgements on appropriate instructional strategies for those students. Subsequently, the strategies were piloted with a separate group of SMEs who provided feedback on their practicability and applicability.

Structure of the assessment tools

The SWANs assessment instruments have subsequently been programmed to be delivered online in a questionnaire format. An example of a SWANs item for Thinking is shown in Figure 1.
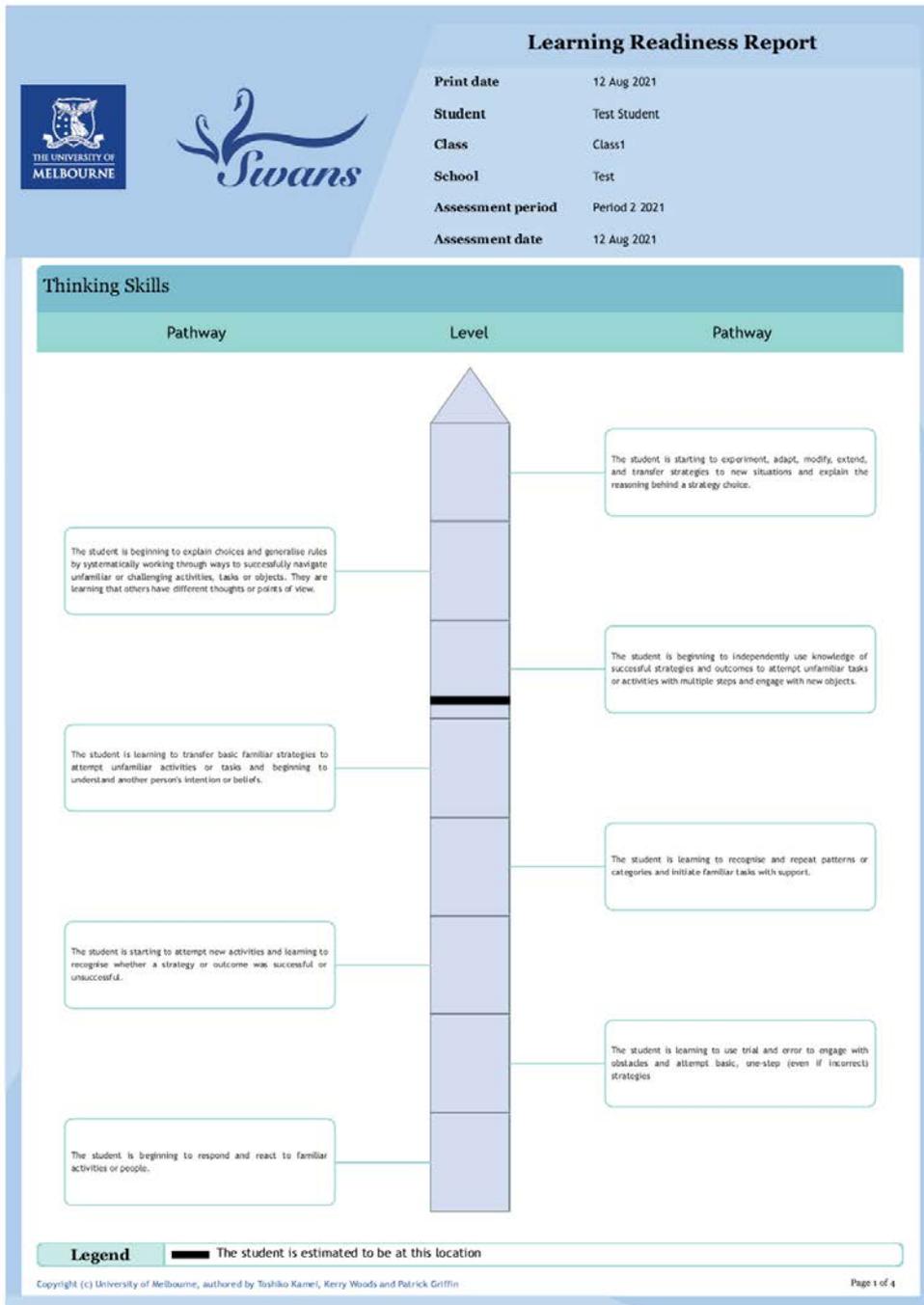

Figure 1 SWANs item for Thinking

Figure 2 SWANS Learning readiness report showing learning progression

The first page (Figure 2) illustrates the learning progression for the learning domain by presenting 'nutshell statements' or brief descriptions of the competencies within each level of learning. The level within which a student is working is denoted by the dark black line.

Learning Pathway for Student Test Student

Thinking Skills

Level 6 The student is learning to use knowledge of successful strategies and outcomes to attempt unfamiliar tasks

At this level, students are learning to participate in activities that involve multiple steps. For example, students may begin to follow multiple step instructions to complete an unfamiliar task or they may apply knowledge of successful strategies to complete familiar, multi-step tasks or activities to accomplish a preferred or relevant outcome. They may also be independently attempting new activities or tasks or engaging with a new object. They may be starting to ask for help that specifically targets the task.

Students may learn to create their own patterns from different materials and begin to apply their knowledge of categories in order to classify or group new or unfamiliar objects. They may also begin to explain reasons behind their choices.

Figure 3 Thinking skills Level 6

The second page (Figure 3) contains an extended statement that describes in more detail the level within which a student is working. Teachers can use this information to set targeted short and long term goals for their student.

Teaching and Learning Strategies for Student Test Student

Thinking Skills

Level 6 The student is learning to use knowledge of successful strategies and outcomes to attempt unfamiliar tasks

- Observe your student and maintain a record of activities the student finds enjoyable and motivating. Draw on information about the student's preferences, responsiveness, and support needs that has been shared by the student's parents/carers and/or by other teachers who know the student well. Draw on this information to motivate the student's participation at different times of the day.

- As appropriate for the student, draw on information and advice from support professionals (e.g., speech therapist, physiotherapist, occupational therapist) or disability-specific organisations to tailor activities for the student.

- As appropriate for the student, associate visual supports and verbal descriptions with objects and activities. These might include augmentative and alternative communication (AAC), key word signing, and picture symbols.

- Support your student's participation in multi-step activities by preparing clearly structured and sequenced activities that have a well-defined outcome. Use explicit instruction by, for example, demonstrating a step-by-step plan (strategy) for solving a problem specific to a task or activity. Implement explicit instruction in conjunction with other instructional components (e.g., the use of visual representations such as video modelling, or guiding your student to 'think aloud' about the steps in an activity).

- Practise monitoring and recording class goal completion (e.g., use a progress chart, sticker chart, calendar).

- Support the student to follow an established routine with a familiar adult and gradually decrease the level of support provided as your student learns to independently carry out multi-step tasks (e.g., setting up a classroom task or activity, finding and sorting the materials they need for a project of personal relevance and interest).

- Rearrange or modify instructional materials to improve your student's successful participation in new activities (i.e., provide scaffolding, examples, visual representations of steps in the activity, a daily/weekly schedule to guide the student through stages towards completion of a simple project). Remind the student of previous success in similar multi-step tasks.

- Ask questions that promote strategy use, self-instruction, self-monitoring, and self-evaluation (e.g., What comes next? Can you show me where you are on the visual schedule? 'How do you feel about _____ ?').

- Provide specific, task-oriented feedback to let the student know what s/he is doing well and what to revise.

- Before providing direct help, first ask your student to describe or explain the nature of the problem with a task and encourage him/her to imagine some possible solutions.

- Give the student a challenge such as an unfamiliar task and allow your student space, time, and a supported environment to think about ways to approach the task. Encourage the use of collaboration between a pair or small group of students to solve simple but challenging problems. Give the group examples of different ways to think about a problem, such as generating ideas and talking about preferences or opinions.

Figure 4 Teaching and learning strategies

The third page (Figure 4) contains teaching and learning strategies that provides suggested teaching and learning strategies that teachers can use to progress their student from their present level of learning to the next.

SWANs and its connection to ABLES

The ABLES suite of materials were developed in conjunction with the ABLES work to strengthen its connection with the Victorian curriculum and enhance their use in Victorian schools. The ABLES version of the assessments links the foundational skills to the most relevant learning domains in the Victorian school curriculum (Victorian Curriculum and Assessment Authority [VCAA], 2021) and reports student progress in these terms.

Impact and further development

The SWANs and ABLES tools were subsequently programmed online to be disseminated nationally. Approximately 360000 student assessments have been carried out to date by the SWANs/ABLES assessments.

Informing the curriculum

The SWANs resources informed the development of the Victorian Towards Foundation curriculum (Underwood, 2020) that was developed in response to the Disability Standards for Education (Department of Education, 2005) that set out that all students should have access to curriculum on the same basis. Teachers of students with more severe disability commented that often, it was hard for them to 'see' their students in the curriculum (Underwood, 2020, p. 209). The SWANs research on interpersonal skills or social skills, communication, emotional skills, and cognitive or learning skills were particularly relevant to both the content and structure of the Towards Foundation Curriculum (Underwood, 2020).

Ongoing development

The SWANs work has been the foundation for development of further resources and work is ongoing. There have been two projects with the Victorian Department of Education and Training to adapt the SWANs suite of resources for use for students with additional learning needs in early childhood settings. This resulted in a set of assessments called Early ABLES. This has then further led to work to adapt the Early ABLES suite of resources for all children aged two to six in funded kindergarten programs called the Early Years Assessment and Learning Tool. This work commenced in 2020 and is ongoing.

In addition, work has taken place with the Australian Curriculum and Assessment Authority (ACARA) to map the SWANs suite of resources to the national literacy and numeracy learning progressions. This was undertaken to ensure that the learning of all students including students with additional learning needs were included in the national learning progressions. This also led to further work to map the SWANs resources to the ACARA Critical and Creative Thinking and Personal and Social Capabilities Continua.

Conclusion

The SWANs program of work has continued since 2007 through two ARC Linkage grants in partnership with the Victorian Department of Education and Training. It drew together input from hundreds of assessment specialists, school leaders, teachers, specialist professionals, and curriculum leaders and is based on thousands of points of student assessment data. Through such a process, it aimed to provide all teachers tools to see students through the eyes of experienced teachers of students with additional learning needs.

References

Coles-Janess, B. & Griffin, P. (2009). Mapping transitions in interpersonal learning for students with additional needs. Australasian Journal of Special Education, 33(2), 141–150. https://doi.org/10.1375/ajse.33.2.141

Department of Education and Training. (2005). *Disability standards for education*. Australian Government. https://docs.education.gov.au/system/files/doc/other/dse-fact-sheet-2-dse_0.pdf

Gale, L. (2018). *The acquisition of goal-directed movement: Developing and reporting a measure of learning readiness for use in classroom settings with students with motor performance needs* [Doctoral dissertation, University of Melbourne]. Minerva Access. http://hdl.handle.net/11343/217267

Glaser, R. (1981). The future of testing: A research agenda for cognitive psychology and psychometrics. *American Psychologist, 36*, 923–36. https://doi.org/10.1037/0003-066X.36.9.923

Griffin, P. (2007). The comfort of competence and the uncertainty of assessment. *Studies in Educational Evaluation, 33*(2007), 87–99. https://doi.org/10.1016/j.stueduc.2007.01.007

Kamei, T. (2019). *Thinking to learn: An investigation of assessing and teaching thinking skills for students with disability* [Doctoral dissertation, University of Melbourne]. Minerva Access. http://hdl.handle.net/11343/224151

Masters, G. (1982). A Rasch model for partial credit scoring. *Psychometrika, 47*(2), 149. https://doi.org/10.1007/BF02296272

Messick, S. (1989). Validity. In R.L. Linn (Ed.), *Educational measurement 3rd ed.*, (pp. 13-103). MacMillan Publishing.

Rasch, G. (1960) Probabilistic models for some intelligence and attainment tests. Neilson & Lydiche.

Roberts, E. (2014). Design and validation of an instrument to assess development of intrapersonal learning skills for students with an intellectual disability and students with autism spectrum. [Doctoral dissertation, University of Melbourne]. Minerva Access [Abstract only]. https://minerva-access.unimelb.edu.au/handle/11343/39767

Senate Standing Committee on Education and Employment (2016). Access to real learning: the impact of policy, funding and culture on students with disability. Parliament House.

Sharma, U., Loreman, T. & Forlin, C. (2012). Measuring teacher efficacy to implement inclusive practices. *Journal of Research in Special Educational Needs, 12*(1), 12-21. https://doi.org/10.1111/j.1471-3802.2011.01200.x

Strickland, J., Woods, K., & Pavlovic, M. (2016, November 27–December 1). *Assessing and understanding early numeracy for students with additional learning needs* [Conference paper] Australian Association for Research in Education, Melbourne. https://www.researchgate.net/publication/318897270_assessing_and_understanding_early_numeracy_for_students_with_additional_learning_needs

Underwood, K. (2020). A curriculum for students with additional needs. In Griffin P. & Woods, K. (Eds.) *Understanding Students with Additional Needs as Learners*. (pp. 209-216) Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-030-56596-1_14

Victorian Curriculum and Assessment Authority (VCAA) (2021). The Victorian Curriculum. https://victoriancurriculum.vcaa.vic.edu.au

Victorian Department of Education and Training. (2021). School operations Students with Disability. https://www2.education.vic.gov.au/pal/students-disability/policy

Victorian Equal Opportunity & Human Rights Commission. (2012). *Held Back: The Experiences of Students with Disabilities in Victorian Schools*. http://www.humanrightscommission.vic.gov.au/media/k2/attachments/1404-VEOHRC_HeldBack_-_StudentwithDisabilityReportW3.pdf

Vygotsky, L.S. (1980). *Mind in society: The development of higher mental processes.* (Eds. M. Cole, V., John Steiner, S., Scribner, & E. Souberman). Harvard University Press.

White, E. H., Woods, K., & Poed, S. (2017, July 2–7). The assessment and development of digital literacy in students with vision impairment and additional learning needs: Preliminary findings from a current PhD study [Conference paper]. 9th ICEVI European Conference, Bruges. http://www.icevi-europe.org/files/2017/empowered-by-dialogue/icevi-europe-2017-proceedings.pdf

Woods, K. (2010). The design and validation of measures of communication and literacy to support the instruction of students with learning disabilities. [Doctoral dissertation, University of Melbourne]. Minerva Access [Abstract only]. http://hdl.handle.net/11343/35468

Wilson, M. (2005). *Constructing measures: an item response modeling approach*. Lawrence Erlbaum Associates.

Wolfe, E. W., & Smith, E. V., Jr. (2007a). Instrument development tools and activities for measure validation using Rasch models: Part I – Instrument development tools. In E.V. Smith, Jr. & R. M. Smith (Eds.). *Rasch measurement: Advanced and specialized applications* (pp. 202 – 242). JAM Press.

Wolfe, E. W., & Smith, E. V., Jr. (2007b). Instrument development tools and activities for measure validation using Rasch models: Part II – Validation activities. In E.V. Smith, Jr. & R. M. Smith (Eds.). *Rasch measurement: Advanced and specialized applications* (pp. 243 – 290). JAM Press.