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RESEARCH REPORT

Written reflective practice abilities of SLT students across the degree programme

Kate. J. Cook[1] | **Cheryl Messick**[2] | **Megan. J. McAuliffe**[1,3]

[1]School of Psychology Speech & Hearing, Te Kura Mahi ā-Hirikapo, University of Canterbury, Christchurch, New Zealand

[2]School of Health and Rehabilitation Sciences, University of Pittsburgh, Pittsburgh, PA, USA

[3]New Zealand Institute of Language, Brain and Behaviour, University of Canterbury, Christchurch, New Zealand

Correspondence
Kate Cook, School of Psychology Speech & Hearing, Te Kura Mahi ā-Hirikapo, University of Canterbury, Private Bag 4800, Christchurch 8140, New Zealand.
Email: kate.cook@canterbury.ac.nz

Abstract

Background: Written reflective practice (WRP) is a teaching tool used across speech–language therapy (SLT) clinical education programmes. The process aims to support the development of reflective skills required for the workplace (e.g., problem-solving and self-evaluation).

Aims: This cross-sectional and repeated-measures study design investigated students' demonstration of breadth of WRP across the clinical education programme.

Methods & Procedures: The participants were 77 undergraduate SLT students in their first, second or final professional year of the clinical programme. Participants wrote critical reflections following an interaction with a client/s as part of their clinical education experiences. Formative feedback was provided after each written reflection (WR). In total four WRs per participant were coded for breadth of WRP using a modification of Plack et al.'s coding schema from 2005. This was completed for each of the four time points across the academic year for each professional year.

Outcomes & Results: There was a statistically significant association between time (i.e., professional year of the programme) and likelihood of demonstration of breadth of reflection for the lower level reflective element of 'attend' and higher level reflective element of 're-evaluate'. A positive trend between time and likelihood of demonstration of breadth of reflection was seen for the lower level element of 'reflection-for-action'. Final-professional-year students exhibited significant enhancements in the higher level elements (e.g., 'premise') compared with first- and second-professional-year students.

Conclusions & Implications: This group of SLT students exhibited significant change in breadth of WRP across the degree programme. This finding has positive implications for facilitating WRP with students and using the current coding framework in clinical programmes.

KEYWORDS
clinical education, reflective practice, speech–language therapy

International Journal of Language & Communication Disorders

What this paper adds

What is already known on this subject

- WRP is one form of reflective practice (RP) used in SLT, allied health, medical and nursing clinical education programmes. Researchers have suggested that RP skills develop over time for students. Previously, studies examining WRP have focused on one off assessment of skill or over a timeframe of 6–10 weeks. Here, we examine SLT students' WRP skills across the degree programme.

What this paper adds to existing knowledge

- SLT students exhibited significant positive change in breadth of WRP across the degree programme as their clinical experience increased. Our results provide quantitative information in support of using RP as a learning tool throughout clinical education programmes for SLT.

What are the potential or actual clinical implications of this work?

- This study offers support for educators of SLT students; for example, how educators can assess WRP, and how educators can foster SLT student skill development with formative feedback and reflective questioning. This study also offers support for student SLT, for example, describing how WRP can be part of their individualized learning approach and provide a purposeful examination of self and clinical skill development.

INTRODUCTION

Reflective practice (RP) in clinical education programmes

RP is defined as 'a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations' (Boud et al., 1985: 19). RP is embedded in critical thinking descriptions (Colucciello, 1997; Facione, 1997), adult learning principles (Brookfield, 1986), and Bloom's taxonomy for higher education (Bloom, 1956; see also Anderson & Krathwohl et al., 2001). As a result, RP is regularly employed in university clinical education programmes for its perceived ability to support student development into competent and reflective practitioners, who then proceed to provide person-centered clinical practice (Bulman & Schutz, 2013; Schön, 1983, 1987). Common modes of RP or RP activities used in both university clinical education programmes and workplaces include: writing (Cook et al., 2019; Plack et al., 2005); verbal discussion groups (Johnston & Banks, 2000; Schaub-de Jong et al., 2011; Tillard et al., 2018); one-on-one discussion (Geller, 2002) and video self-analysis (Cruice, 2005).

RP activities have been used in allied health, medical and nursing clinical education programmes (e.g., (Aronson et al., 2012; Chabeli, 2010; Chambers et al., 2011; Cook et al., 2019; Dunne et al., 2019; Plack et al., 2005). They have been found to have a positive impact on medical students' ability to diagnose complex cases (Mamede et al., 2008) and predict the academic success of pharmacy students (Tsingos-Lucas et al., 2017). In occupational therapy RP has been described as a foundation skill towards developing professional skills (Zimmerman et al., 2007).

Feedback from students engaged in RP activities as part of clinical education programmes has been largely positive, with students stating they valued RP as a learning tool and memory aid, that engaging in RP increases self-awareness skills and developed their professional identities (Karpa & Chernomas, 2013; Lim & Low, 2008a, 2008b; Ng et al., 2012; Plack et al., 2008; Roche & Coote, 2008). However, additional feedback suggests that students find RP time-consuming and they may externalize RP activities, that is, focusing on what they thought the educator expected to read or hear rather than using RP activities as an opportunity for internalized learning (Dunne et al., 2019; Harris, 2005).

Development of written reflective practice (WRP) abilities

The current study focused on WRP for speech–language therapy (SLT) students. WRP is one mode of RP regularly used in clinical education programmes, including SLT. WRP is written content 'in which the writer aims to consider an event, problem or time period from a reflective standpoint …' (Walker, 1985). While each clinical programme differs, in general a WRP activity may be one where educators require students to write about a clinical experience/s at specific timepoints during their clinical placements. WRP activities may be guided with questions, others unguided, and WRP activities can be assessed, voluntary or a mandatory part of the clinical programme (Cook et al., 2019; Hill et al., 2012; McAllister & Lincoln, 2004; Plack et al., 2005; Williams et al., 2000). WRP is an important consideration for university education providers due to its alignment with adult learning principles as described by Brookfield (1986). It promotes questioning and critique of approaches and techniques, as well as self-evaluation and evaluation of the supervisor (Brookfield, 1986). When compared with face-to-face interactions with a supervisor, WRP allows students the time to consider their evaluation of themselves or an interaction (Cook et al., 2019; Dunne et al., 2019; Plack et al., 2008). The written form is also considered a useful aid for students who struggle to demonstrate and verbalize their reasoning and evaluation skills (Cook et al., 2019; Plack et al., 2008). It allows students to develop and demonstrate independent problem-solving skills related to clinical experiences, without putting the student or client safety at risk. Furthermore, completing written reflections (WRs) was found to promote emotional and cognitive learning, which resulted in a new understanding of interdisciplinary team practices for allied health students (Domac et al., 2015). Finally, it has been suggested that when educators provide formative feedback in a timely manner on WRP activities, this may have a positive impact on the demonstration of WRP abilities by students (Aronson et al., 2012; Cook et al., 2019; Dunne et al., 2019).

When examining how to measure WRP in clinical programmes, several studies and theorists have used the categories of breadth and depth of reflection (Cook et al., 2019; Hill et al., 2012; Mezirow, 1991; Plack et al., 2005; Schön, 1983, 1987). Depth of reflection is described as an overall level of RP skill (Plack et al., 2005; Hill et al., 2012). Breadth of reflection, the focus of the current study, refers to nine different reflective processes or elements undertaken by the learner (Mezirow, 1991; Plack et al., 2005). Theorists have reported that some elements within breadth of reflection take longer to develop than others. Such aspects are described as higher levels of reflection such as 'reflection-in-action' (reflecting and making changes in the moment), 'content' (consider another's perspective), 're-evaluate' (making comparisons with theory or clinical experiences) or 'premise' (acknowledging and working through the impact of one's assumptions/bias and beliefs). Comparatively breadth elements such as 'return' (describing the event/session), 'attend' (describing one's own emotions during the event/session), 'reflection-on-action' (describing the event and then discussing one's learning from this event), 'reflection-for-action' (describing the event and then discussing a plan for the future or next step) and 'process' (the inclusion of strategies used or available) are categorized as lower level reflective elements and are reported to develop sooner (Duke & Appleton, 2000; Mezirow, 1991; Schön, 1983, 1987; Wong et al., 1995) (see Appendix A for a full explanation of RP breadth terms, categorization, level of RP and examples).

A number of studies have examined the development of WRP abilities across time for university student learners engaged in clinical programmes with positive outcomes reported (Aronson et al., 2012; Cook et al., 2019; Duke & Appleton, 2000; Dunne et al., 2019; Tsang, 2012). Most studies document significant development of student written reflective abilities (Aronson et al., 2012; Cook et al., 2019; Duke & Appleton, 2000; Dunne et al., 2019; Tsang, 2012). Across these studies, it has been found that students benefit from being taught concepts inherent to RP, and learning a framework for WRP before engaging in the process. The studies included varied assessment methods, and either a content analysis approach (Aronson et al., 2012; Cook et al., 2019; Duke & Appleton, 2000), a thematic analysis approach (Tsang, 2012) or mixed-methods approach (Dunne et al., 2019). The time points investigated provide only a snapshot of student RP abilities, with examination over 6 weeks to a maximum of 12 months (Aronson et al., 2012; Cook et al., 2019; Dunne et al., 2019; Duke & Appleton, 2000; Tsang, 2012). Limitations of the above studies, which provide support for the current study, include inconsistent provision of formative feedback between submissions of WR, inconsistent numbers of WR examined or number of WR examined per participant, and no examination of WRP breadth from start to finish of the clinical programme, including SLT students.

SLT student WRP abilities

Specific to SLT students, studies using instruments for evaluating WRP have demonstrated that students also improve in their abilities to demonstrate their WRP skills across short periods of time (Cook et al., 2019; Hill et al.,

2012). However, it is unclear whether when examining the elements for breadth of WRP, students follow similar patterns of development across the course of the SLT clinical programme. For example, in Cook et al. (2019), the SLT students who demonstrated 'process' (an ability to describe their process or the strategies used) were more likely to demonstrate a higher level RP ability described as 'premise' (the ability to identify and explore own assumptions, values, beliefs and biases) in the 6-week period (Cook et al., 2019) compared with students who did not demonstrate 'process'. In comparison, Dunne et al.'s (2019) mixed methods case study design followed six SLT students across a 10-week period as they completed two clinical placements. Findings with SLT students suggested three different WRP development trajectories: 'steady growth', 'no clear change' and 'gradual decline'. Dunne et al.'s results suggested that students who internalized RP as a learning strategy maintained or developed RP abilities compared with those who externalized RP as a requirement of the clinical programme (Dunne et al., 2019).

We suggest that with improved understanding of the patterns of development educators can aim to better SLT support student learning (Boles, 2018; Middlemas et al., 2001). Furthermore, educators could provide quantitative evidence to SLT students in support of using RP activities across SLT programmes. Specific to WRP activities, this could include providing a suggested number of WRP activities, tailored education and guidelines for provision of formative and summative feedback on WRP activities by educators. Furthermore, the identification of patterns of development or combinations of breadth elements for WRP at specific timepoints could support a transfer of learning for WRP abilities as clinical competency increases over time. The term 'transfer of learning' within the education literature is described as the hypothesis that learning in one area, context or time point will generalize to another, and RP is thought to aid the transfer of learning (Bransford & Schwarts, 1999). In the realm of SLT, this was shown as an increase in clinical competency as clinical experience increased for SLT students, regardless of placement type or context (Sheepway et al., 2014).

Unlike the above studies that describe student growth in RP abilities, Williams et al. (2000) found no improvement in physical therapy students' development of WRP abilities over an 8-week period. The possible reasons given for this were a lack of education to students about RP processes, disagreement between raters and no formative feedback provided by educators.

In summary, significant development of WRP has been documented for specific timepoints within clinical education programmes (Aronson et al., 2012; Cook et al., 2019; Duke & Appleton, 2000; Dunne et al., 2019; Tsang, 2012). What remains unclear is whether student development of WRP skill exists both within and across the course of a degree programme for SLT. Examining the demonstration of breadth of WRP across the degree may result in the identification of patterns of breadth of RP that allow tailored support for students. This may also shed light on the amount of WRP activities required to develop student learners into the 'reflective practitioner' required for competent workplace practice (Schön, 1983, 1987). Finally, examination of WRP over time may provide quantitative evidence of a positive growth relationship between RP, development of clinical skills and clinical competence. Given this, the present study examined the impact of time on the proportion and characteristics of breadth of WRP skills for SLT students across year groups (first, second and final). Second, it examined the impact of time on SLT student breadth of WRP skills within each year group (first, second and final) of the SLT clinical programme.

METHOD

This study received ethical approval from the Educational Research Human Ethics Committee of the University of Canterbury, New Zealand. All participants provided written consent to participate.

Context of the study

This cross-sectional and repeated-measures design study was conducted as part of the clinical programme for SLT students at the University of Canterbury, New Zealand. The students included in this study were all completing a 4-year undergraduate honours degree in SLT, similar to the educational approach also undertaken in the UK and Australia. In the New Zealand version of this model, the first year of study is a generic year that does not include clinical education, and years 2–4 students are professionally orientated (renamed first, second and final professional year) and include considerable clinical placement experiences. Students are eligible to practice as an SLT at the conclusion of the final professional year.

As part of the regular clinical education programme, across each semester students were introduced to RP following an intentional approach of using dialogic teaching, class discussions, metacognitive discussions, informal discussions with clinical educators (individual or group) WR (informal and assessed) and verbal RP groups (discussion groups with student peers and a clinical educator facilitating professional topics (see Tillard et al., 2018, for the structure of verbal RP groups for SLT students). Appendix B describes the RP clinical education programme followed

TABLE 1 Biographical details of student participants by professional year

Professional year	Number of students	Males/females	Average age/SD (years)	Prior clinical experience[a]
First	26	1/25	20.5 (2.24)	None
Second	29	1/28	21.2 (0.81)	2 semesters
Final	22	0/22	23.0 (6.34)	4 semesters

[a]Note: One semester is 12 weeks.

by the SLT clinical education programme. Submitting regular weekly WR was standard practice for all clinical courses and was embedded into clinical education learning outcomes.

The goal of this study was to estimate the proportion and describe the characteristics of SLT student WRP skills at the same time points for each cohort of students (at the start and end of each clinical course) in the professional degree. This allowed for the examination of WRP skill across the degree programme as well as examination of WRP skill within each professional year. For each professional year (e.g., first, second and final), students in the respective professional year groups completed two semesters of academic study, which included 12 weeks per semester of clinical experiences in a range of clinical environments and populations including preschool, school-aged children and adults. At two points in the clinical programme, students completed two clinical placements described as 'block placements'. A block placement is a full-time placement (i.e., 40 h per week) with no academic class requirements (McAllister et al., 2013).

Participants

The study included 77 undergraduate students enrolled in clinical courses as part of the SLT honours programme. Table 1 describes participant who agreed to participate in the study by professional year of study. The average age of the participants was 21.5 years (SD = 3.95) with 75 females and two males participating in the study. The study excluded any students who withdrew from a clinical course during the semester, or who declined to participate in the study (six students).

Instrument

Plack et al.'s (2005) framework for coding WRP was used because of its validity and reliability, measurement of both breadth and depth of reflection and for its previous use with both SLT and physical therapy (PT) students (Cook et al., 2019; Hill et al., 2012; Plack et al., 2005). There were two primary components for the coding framework: (1) breadth of reflection and (2) depth of reflection. For this study, only data for (1) breadth of reflection were examined. Depth of reflection was examined in a separate study. Breadth of reflection refers to the different processes of reflection undertaken by the learner (Mezirow, 1991; Plack et al., 2005). As per Cook et al. (2019) minor adaptations to Plack et al.'s framework were undertaken—including redefining the element 'content', inclusion of keywords to signal and highlight different elements, the addition of common elements that co-occur in WRP, inclusion of examples that related to SLT topics and examples of what was not a specific breadth element. Breadth elements were organized from low-level RP elements to higher level RP elements or elements that contribute to critical reflections. Acceptable intra rater and inter rater reliability was gained following the modifications (Cook et al., 2019, based on Boud et al., 1985; Mezirow, 1991; Plack et al., 2005; Schön, 1987). See Appendix A for the rater training protocol discussing breadth elements with examples. See Cook et al. (2019) for the full version with breadth and depth of reflection included.

Procedure

Participants were required to write and submit 'critical reflections' as part of their regular clinical course requirements. One WR per week was required following a clinical session. Students were required to submit each WR within 24 h of the clinical session or experience they were reflecting on. For this study only two WR from each clinical course were analysed per participant. The WR selected for analysis were taken from the start and end of each clinical course for each semester, totalling a maximum of four WR for each student across the professional year (reported as T1, T2 (start and end of semester 1), T3 and T4 (start and end of semester 2).

Guiding questions were provided to assist reflecting and are part of standard practice by the clinical education team. As per Cook et al. (2019), guiding questions were reviewed and modified by the researchers to ensure all areas of the modified Plack et al. (2005) coding system could be addressed by students (see Appendices B and C for a list of sample questions provided to students and timing of questions).

International Journal of Language & Communication Disorders

This study examined usual practice. Therefore, students in the same professional year group were asked to respond to the same questions. However, some students chose not to respond to all questions. Furthermore, some WR questions posed to students varied between professional year groups. No guidelines were given to students pertaining to WR length. As is usual practice, each of the clinical educators (CE) supervising the participants reviewed and gave regular feedback on the WR submitted. As per Cook et al.'s (2019) procedure, all CE were encouraged to provide at least two pieces of written formative feedback relating to the process of reflection (breadth) undertaken. CE were familiar with the coding framework and could use the coding framework to construct the feedback if they desired (e.g., Element included: *Process*, element chosen for formative feedback: *Reevaluate*. Feedback to student: 'Good job, you have described the strategies you utilized during the session. Next time consider building on this by reflecting on how and why you have changed the types of strategies you use for this client compared to your other client'). CE were encouraged to provide formative feedback to students in a timely manner, so that the student could consider the feedback provided, before their next WR was submitted. The specific type and timing of formative feedback was not controlled for or measured as part of this usual practice study. At the end of each semester, the CE supervising the students removed any identifying information from the four WR at the required timepoints (T1–T4) for each participant, and placed the WR in a shared locked computer folder for analysis by the research team.

Data analysis

WRs were coded by a research assistant, who completed 7 h of training with one of the researchers before commencing coding. A second research assistant, who underwent the same training, completed coding for interrater reliability. Training consisted of a review of Cook et al.'s (2019) modifications to Plack et al.'s (2005) code descriptions and sample questions (see Appendices A and C) as well as practice in joint coding to establish intra- and interrater reliability. Where disagreements in coding arose during training, discussion continued and breadth elements and examples were redefined until consensus was reached (as per Cook et al., 2019; Hill et al., 2012).

A total of 273 of a possible 308 WR were submitted (from 77 participants, across the three year groups, at four time points—T1–T4). Table 2 indicates the number of participants by year group who submitted a WR for each time point. Coding of the words, sentences and paragraphs was carried out within each participant's responses to the guiding questions in each of their WR. A binary coding system was implemented when reviewing the WR (similar to that of Cook et al., 2019; Hill et al., 2012) whereby 1 was used to indicate presence of an element anywhere in the WR and 0 was used to indicate an element was not present in the WR. As there are nine breadth of reflection elements in the instrument, the highest tally a student could receive for a WR was nine for each submission. As per past studies, the research assistants and the researcher agreed that any one sentence or paragraph could contain more than one element (Cook et al., 2019; Hill et al., 2012). Descriptive statistics were used to report the average scores participants in each year group exhibiting a specific element of breadth of reflection for each of the four time periods.

TABLE 2 Number of participants who submitted a written reflection (WR) for each time point across the academic year (% of WRs compared with the expected number)

Professional year	T1	T2	T3	T4
First	26 (100%)	24 (92%)	19 (73%)	18 (69%)
Second	29 (100%)	28 (96%)	27 (93%)	24 (82%)
Final	22 (100%)	20 (91%)	15 (68%)	13 (59%)
Totals	77 (100%)	72 (94%)	66 (79%)	55 (71%)

Statistical analysis

Mixed effects models were used to analyse the effects of time (both cross-sectional, i.e., professional year group, and repeated-measures data, i.e., timepoints T1–T4) and element (e.g., 'content' or 'process') on the dependent variable, breadth of WRP (Bates et al., 2015). Dependent variables were coded as $1 = x$ and $0 = y$. The repeated measurement structure was represented by random effects for the intercept and slope on the participant level, estimating the dependency structure between random effects for each of the elements, assuming a multivariate normal distribution with an unstructured variance–covariance matrix. Analysis was carried out in the statistical software environment *R* (R Core Team, 2015), using the add-on packages *lme4* (Bates et al., 2015) and ordinal (Christensen, 2015). The analysis for each element began with a full model consisting of the full effects of professional year group and time point for each breadth element. We created a random effects structure adding participants as random effects (with individual slopes for time point). Model evaluation proceeded in a backward-stepwise iterative fashion seeking to reduce the full model to a reduced model containing only significant effects (with alpha set at 0.05). Model fitting for each element was independently supported by fitness comparisons.

Reliability

Analysis of inter- and intra-rater agreement for breadth of reflection at the paragraph level was completed for 20% of WR using per cent agreement (number of times the raters agree divided by the total number of observations multiplied by 100) (Miles & Huberman, 1994) and kappa statistics (difference between observed and hypothetical probability of chance agreement) (Landis & Koch, 1977). Strength of agreement was determined using criteria by Landis and Koch (1977) (kappa < 0 suggest poor agreement, 0.01–0.20 slight agreement, 0.21–0.40 fair agreement, 0.41–0.60 moderate agreement, 0.61–0.80 substantial agreement and 0.81–1.00 almost perfect agreement). Interrater reliability of mean percentage agreement presence of breadth of elements ranged from 75% to 99% with a mean of 91% kappa values ranged from −0.03 to 1 with a mean of 0.44. Strong interrater reliability was demonstrated for 'attend' and 'return' elements. Moderate interrater reliability was demonstrated for 'process' (89%), 'premise' (98%) and 'reflection-for-action' (95%) elements. Fair agreement was demonstrated for 'reflection-on-action' (90%) and 're-evaluate' (95%). Poor to slight agreement was demonstrated for 'reflection-in-action' (97%), 'content' (99%) and 're-evaluate' (95%). The variation in kappa values despite high per cent agreement is a result of kappa underestimating agreement for elements 'reflection-in-action', 'content' and 're-evaluate'. These elements only occur in a small number of instances (Viera & Garrett, 2005). Intra-rater reliability for breadth of elements yielded a mean per cent agreement of 98% with a range of 97–100% (kappa values ranged from 0.65 to 1 with a mean of 0.88) indicating strong reliability across the elements.

RESULTS

A total of 46 participants (60% of possible participants who consented to participate in the study) submitted a WR at each of the four time points (T1–T4). Table 2 provides details of participants, organized by professional year and time point, and it indicates participant WR submissions. All professional year groups demonstrated participant attrition over time.

Effect of time on breadth of WRP across year groups

Figure 1 demonstrates the distribution of participants in each year group exhibiting a specific element of breadth of reflection averaged over the four time periods. Participants consistently demonstrated use of the lower level breadth element 'return', with 'reflection-on-action' and 'attend' also demonstrated by the majority of participants. The elements described as higher level RP elements 'reflection-in-action', 'premise', 'content' and 're-evaluate' were demonstrated by a smaller number of participants. However, the higher level RP elements show an upward trend across the three professional-year groups indicating that, as clinical experience increased, more participants demonstrated these elements.

To examine the data statistically, separate generalized linear mixed effect models (*glmer*) were run, with each of the elements as a binomial dependent variable (Bates et al., 2015). The fixed effects were professional year group (first, second and final) and time point within those professional year groups (T1–T4). The outputs of the final statistical models for each element are shown in Table 3. Models could not be fitted for 'content' and 'reflection-in-action' due to limited data samples and for 'return' due to ceiling effects. To compare second-professional-year students against final-professional-year students we releveled each model for each element with second-professional-year students mapped to the intercept (Table 3).

The final models revealed that for the element of 'attend' there was a significant positive effect of time across all professional year groups (final-professional-year students $\beta = 1.45$ (0.71), $z = 2.04$, $p < 0.05$), second-professional-year students ($\beta = 3.09$ (0.82), $z = 3.75$, $p < 0.001$), first-professional-year students $\beta = -3.09$ (0.82), $z = -3.75$, $p < 0.001$). There was a significant positive effect of time and 're-evaluate' for second-professional-year students only ($\beta = 1.02$ (0.53), $z = 1.92$, $p < 0.05$). Positive trends over time was identified for second-professional-year students for the elements of 'reflection-on-action' ($\beta = 1.13$ (0.60), $z = 1.90$, $p = 0.06$) and final-professional-year students for the element 'reflection-for-action' ($\beta = 0.81$ (0.46), $z = 1.75$, $p = 0.08$). A significant negative effect of time was also identified for the element of 're-evaluate' for final-professional-year students only ($\beta = 0.72$ (0.27), $z = 2.67$, $p < 0.05$). Combined, the models for 'attend', 'premise', 're-evaluate' and 'reflection-for-action' support a trend for an increase in the proportion of RP elements across the degree programme, with all students demonstrating the element of 'return' and a small data sample limiting interpretation of elements 'content' and 'reflection-in-action'.

Effect of time on breadth of WRP within professional year groups

Figures 2–4 demonstrate the proportion of participants in each professional year group exhibiting a specific element of breadth of reflection at each of the four time

TABLE 3 Coefficients of six binomial mixed-effects models, one for each element of breadth of written reflection (WR) (excluding return, reflection-in-action, content)

Model	Fixed effects	Estimate	SE	*Z*-value	Pr (>|*z*|)	
Model 1: Attend	Intercept	0.05	0.42	0.12		
	First-year students	−3.09	0.82	−3.75	0.00	***
	Second-year students	3.09	0.82	3.75	0.00	***
	Final-year students	1.45	0.71	2.04	0.04	*
	Time	0.72	0.27	2.67	0.01	**
	First-year student development over time compared with second-year students	1.41	0.42	3.38	0.00	***
	Final-year student development over time compared with first-year students	0.06	0.53	0.12	0.91	
	Final-year student development over time compared with second-year students	1.47	0.56	2.65	0.01	**
Model 2: Reflection on action	Intercept	0.82	0.39	2.09		
	First-year students	−1.13	0.60	−1.90	0.06	
	Second-year students	1.13	0.60	1.90	0.06	.
	Final-year students	−0.43	0.56	−0.76	0.44	
	Time	0.17	0.23	0.75	0.45	
	First-year student development over time compared with second-year students	0.67	0.32	2.08	0.04	*
	Final-year student development over time compared with first-year students	0.18	0.35	0.51	0.61	
	Final-year student development over time compared with second-year students	0.84	0.34	2.46	0.01	*
Model 3: Reflection for action	Intercept	−0.95	0.54	−1.76		
	First-year students	−0.37	0.43	−0.87	0.39	.
	Second-year students	0.37	0.43	0.87	0.39	
	Final-year students	0.81	0.46	1.75	0.08	.
	Time	−0.28	0.14	−2.04	0.04	*

(Continues)

International Journal of Language & Communication Disorders

TABLE 3 (Continued)

Model	Fixed effects	Estimate	SE	*Z*-value	Pr (>|z|)	
Model 4: Process	Intercept	0.93	0.29	3.24		
	First-year students	0.41	0.31	1.34	0.18	
	Second-year students	−0.41	0.31	−1.34	0.18	
	Final-year students	−0.41	0.34	−1.20	0.23	
	Time	−0.14	0.12	−1.24	0.22	
Model 5: Re-evaluate	Intercept	−1.09	0.42	−2.60		
	First-year students	−1.02	0.53	−1.92	0.05	.
	Second-year students	1.02	0.53	1.92	0.05	*
	Final-year students	−1.22	0.70	−1.75	0.08	.
	Time	−0.35	0.40	−0.86	0.39	
	First-year student development over time compared with second-year students	0.35	0.34	1.02	0.31	
	Final-year student development over time compared with first-year students	1.38	0.41	3.35	0.00	***
	Final-year student development over time compared with second-year students	1.73	0.39	4.49	0.00	***
Model 6: Premise	Intercept	−3.02	0.82	−3.69		
	First-year students	−0.96	0.90	−1.07	0.28	
	Second-year students	0.96	0.90	1.07	0.28	
	Final-year students	−0.07	1.04	−0.06	0.95	
	Time	0.01	0.40	0.03	0.97	
	First-year student development over time compared with second-year students	−0.96	0.90	−1.07	0.28	
	Final-year student development over time compared with first-year students	0.77	0.54	1.43	0.15	
	Final-year student development over time compared with second-year students	0.92	0.46	1.99	0.05	*

Note: Following the backwards step-wise process, the best-fit models are reported.

*$p = 0.05$, **$p = 0.01$, ***$p = 0.001$.

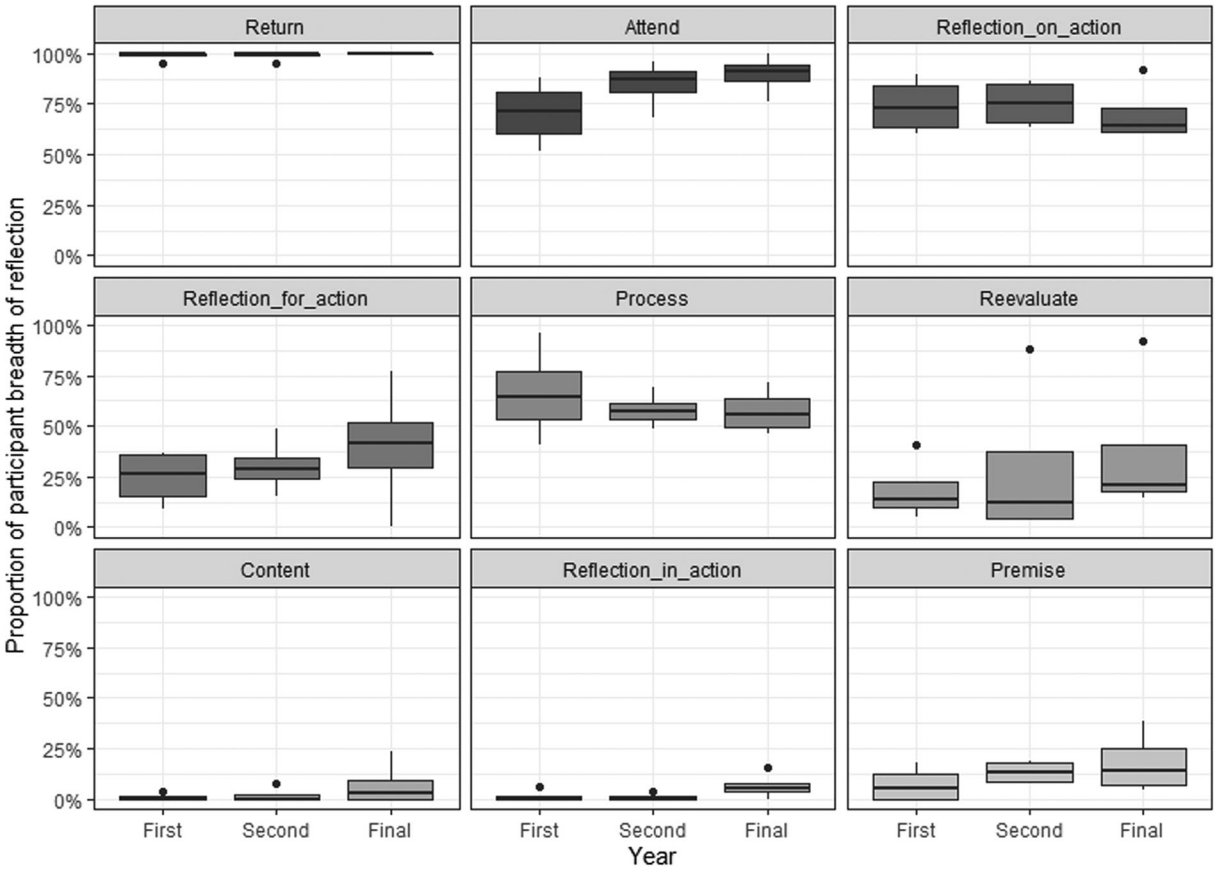

FIGURE 1 Proportion of participants in each year group exhibiting a specific element of breadth of reflection averaged across T1–T4

periods (T1–T4). Within professional year groups the majority of trend lines are moving in a similar positive direction over time. For final-professional-year students, the final time point visually indicates an effect of time for higher level elements (Figure 4). Time point two for first- and second-professional-year students visually indicates an effect of time for the element 're-evaluate' (Figures 2 and 3). Negative trends for 'reflection-for-action', and 'process' elements and variable proportion of 'reflection-on-action' are seen for final-professional-year students (Figure 4). The negative trend 'reflection-in-action' in the final professional year was unexpected.

To evaluate the effect of time on the demonstration of the various elements within each professional year group we used the separate *glmer* models and backwards stepwise process described above for each element (Table 3). A positive interaction effect exists between final-professional-year students and time for the elements 'attend' ($\beta = 1.47$ (0.56), $z = 2.65$, $p < 0.01$), 're-evaluate' ($\beta = 1.73$ (0.39), $z = 4.49$, $p < 0.001$) and 'premise' ($\beta = 0.92$ (0.46), $z = 1.99$, $p < 0.05$). A positive interaction effect exists between second-professional-year students and time for the elements of 'attend' ($\beta = 1.47$ (0.56), $z = 2.65$, $p < 0.001$), and 'reflection-on-action' ($p < 0.05$). Finally, to examine the effect of time within the first-professional year we releveled each model for each element with second-professional-year students mapped to the intercept. This analysis revealed a significant positive effect of time within first-professional-year students for the elements of 'reflection-on-action' ($\beta = 0.67$ (0.32), $z = 2.08$, $p < 0.05$) and 'attend' ($\beta = 1.41$ (0.42), $z = 3.38$, $p < 0.001$).

DISCUSSION

The purpose of the study was to examine the effect of time on breadth of WRP across the SLT clinical programme and within professional year groups. The results indicated that, in general, as clinical experience increased so did demonstration of SLT student WRP abilities, specifically for the elements 'attend', 'reflection-for-action', 're-evaluate' and 'premise'. Within SLT professional year groups, final-professional-year students improved the most in their ability to demonstrate higher level RP elements, second-professional-year students were the most variable group in their WRP abilities and first-professional-year students improved the most in their demonstration of WRP abilities for low-level RP elements of 'attend' and 'reflection-on-

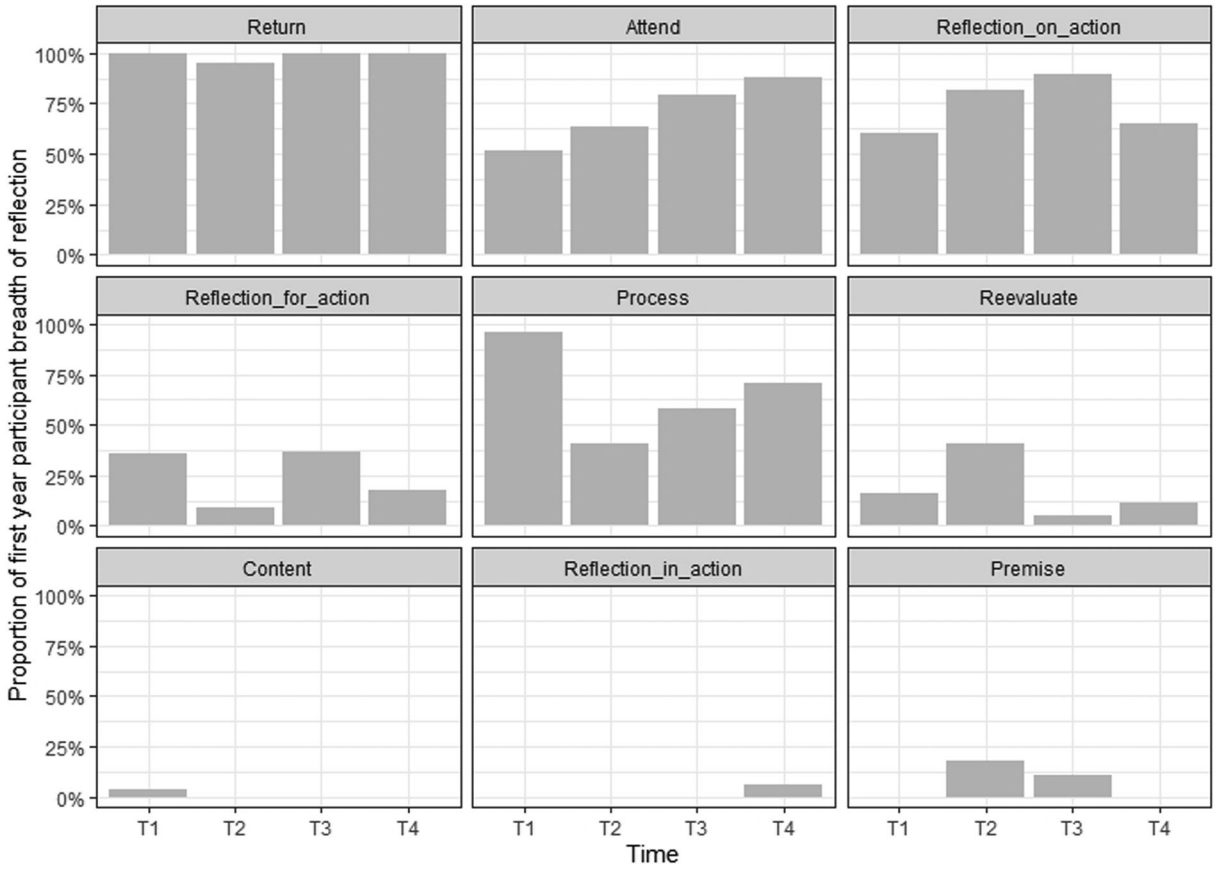

FIGURE 2 Proportion of first-professional-year participants who demonstrated an element of breadth of reflection at that particular time point (T1–T4). See Appendix A for a definition of each breadth element

action'. The findings are discussed with implications for clinical education, limitations and future research.

Breadth of WRP as clinical experience increases

Consistent with previous studies, SLT students demonstrated a trend towards increasing the presence of specific elements of WRP over time as clinical experience increased (Cook et al., 2019; Hill et al., 2012; Plack et al., 2005). The elements of 'attend' (acknowledges and begins to work with feelings) and 'reflection-for-action' (occurs before being faced with the situation; begins to plan for the future) were present significantly more often across the degree programme as clinical experience increased, with a positive trend across the degree programme for the element of 're-evaluate' (reappraises the situation vis-à-vis past experiences). One reason for the similar findings across a longer time period, as compared with previous studies, could be related to the provision and timing of formative feedback (Cook et al., 2019; Plack et al., 2005; Williams et al., 2000). For example, Cook et al. (2019) found similar results in a 6-week period. In that study, the timing and characteristics of feedback were controlled for, possibly positively influencing the emergence of higher level reflective skills within the 6-week study. For the current study, as part of following usual practice, this practice was encouraged but not evaluated. It is unknown whether the provision of feedback provided in a systematic fashion (in terms of timing and type), as implemented in Cook et al. (2019), would have resulted in the demonstration of higher level reflective elements more often. The role of formative feedback in fostering WRP skills warrants further investigation.

Students in the first-professional year of their degree programme exhibited a high proportion of low-level RP elements ('return', 'attend' and 'reflection-on-action') as clinical experience increased. As a group, these students appeared to have a strong focus on reflecting on feelings, emotions, and describing events—possibly due to being exposed to a number of new clinical experiences. This finding was expected given similar findings for a previous study by Hill et al. (2012) for first-professional year SLT students. The results are also in line with Cook et al. (2019)'s suggestion that the guiding questions may prime students to

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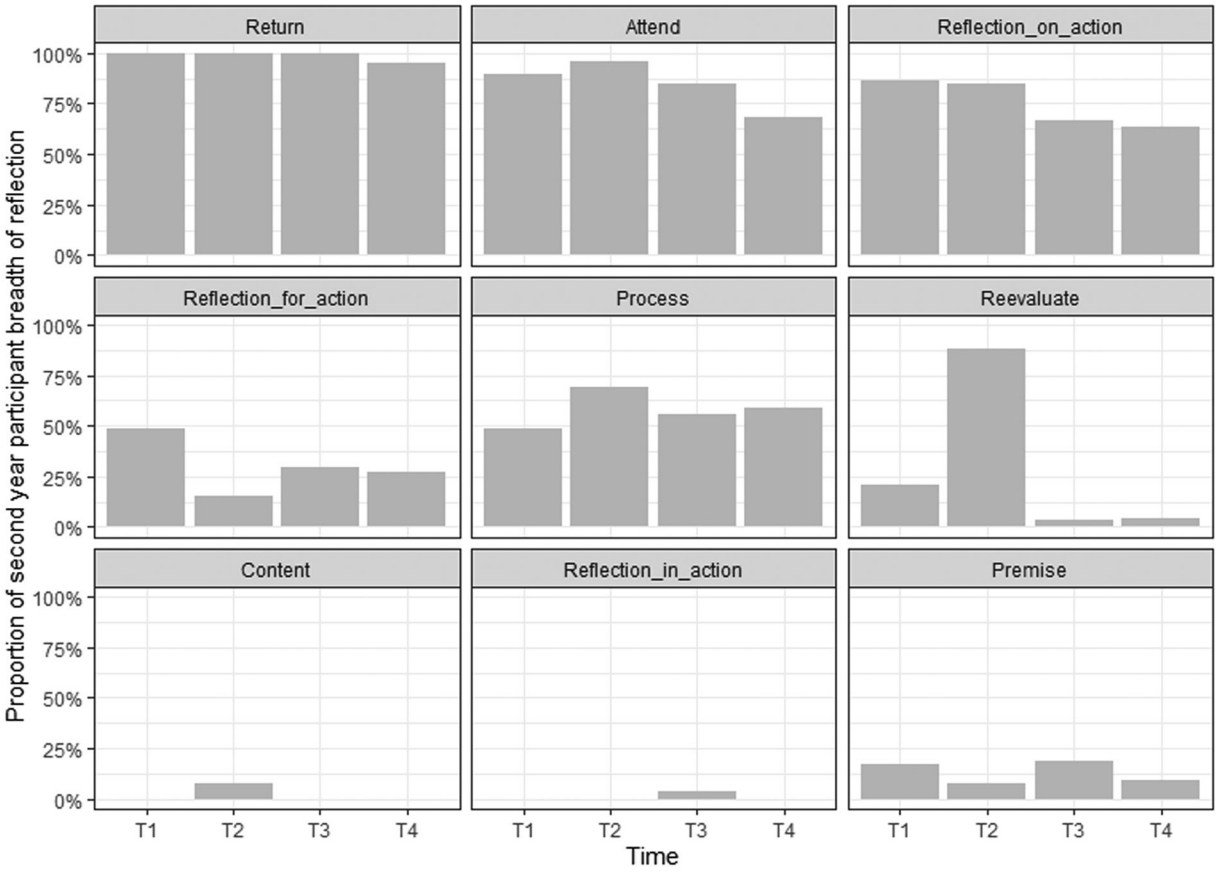

FIGURE 3 Proportion of second-professional-year participants who demonstrated an element of breadth of reflection at that particular time point (T1–T4). See Appendix A for a definition of each breadth element

demonstrate the low-level RP elements. For students in the second and final professional years, these RP elements ('return', 'attend' and 'reflection-on-action') are demonstrated in similar proportions of students in both year groups. Additionally, emotional reactions even perhaps appear of less importance to students as they attempt to explore higher level reflective elements (Cook et al., 2019). It seems likely that these results relate to enhanced confidence facilitated by an increase in academic knowledge and clinical experiences.

Regardless of clinical experience level, the presence of the majority of higher level RP elements, for example, 'content', 'premise' 'reflection-in-action' was low. While it was anticipated that final-professional-year students might demonstrate greater presence of these elements over time, the small number of final-professional-year SLT students identified as demonstrating these elements was unexpected. However, on further examination, this finding is similar to past studies for SLT, nursing and physical therapy students regardless of year of clinical experience (Cook, et al., 2019; Duke & Appleton, 2000; Hill et al., 2012; Plack et al., 2008). For example, only 5.9% of final year physical therapy student WRP contained reflection-in-action, and only one of 45 first-professional year SLT student writing samples contained 'premise' or 'reflection-in-action' (Hill et al., 2012). Therefore, we suggest that this finding can be attributed to two possible considerations: that the asynchronous mode of WRP may limit demonstration of some RP elements as students are looking back on the experience. It may be that WRP lends itself to better demonstrating specific breadth elements compared with the higher level breadth elements. Second, that students with the most autonomy in clinical placements (final-professional-year students), are more intrinsically motivated to showcase their reasoning, learning and problem-solving in written form, knowing that their CE or supervisor has not already observed their practice in the moment. Therefore, educators could encourage final-professional-year students to use WRP as an opportunity to discuss their reasoning for decision making, and problem-solving in-the-moment in detail, with comparisons with previous clinical experiences (Cook et al., 2019; Duke & Appleton, 2000; Plack et al., 2005).

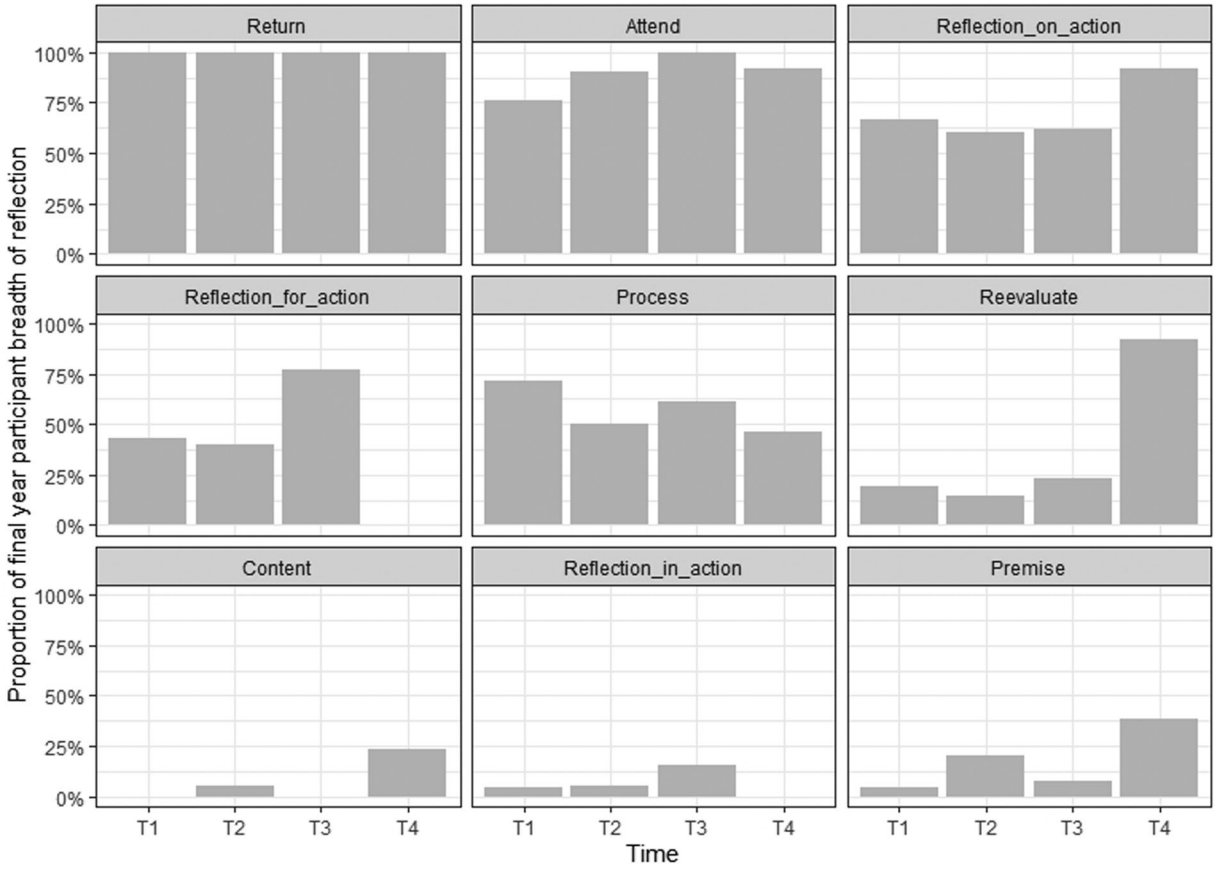

FIGURE 4 Proportion of final-professional-year participants who demonstrated an element of breadth of reflection at that particular time point (T1–T4). See Appendix A for a definition of each breadth element

Breadth of WRP within each professional year group

The current study highlighted both a positive transfer of learning and variability for demonstration of specific elements within professional year groups for specific elements of WRP. First-professional-year students demonstrated more low-level RP elements over the course of the first-professional year in comparison to other year groups. The continued presence of many lower level RP elements (excluding 'process') both within the first-professional year and between the first- to second-professional year suggests that a transfer of learning may exist for demonstrating low-level RP elements. The consistency of using low-level RP elements from the first-professional year to the second supports the notion that WRP practice is effective as a learning tool for students, particularly for first identifying the low-level RP elements the student is readily able to demonstrate, and then providing individualized education and feedback with the aim of developing the student's higher level RP elements (Cook et al., 2019).

Second-professional year (or mid-level) students, as a group, demonstrated the most variability across time points and elements for WRP. While unexpected, the variability may in fact be related to student patterns of development in clinical education. Dunne et al.'s (2019), study described three trajectories of development for WRP and noted that variability characterized SLT learners' RP at similar stages of the professional programme to students in the current study. Furthermore, clinical competency data from Competency Assessment in Speech Pathology, COMPASS®, (a valid and reliable standard outcome measure for clinical competency of SLT students that is used throughout SLT clinical programmes in Australia, New Zealand and Hong Kong) for second-professional-year students, also suggests such variability is an acceptable pattern for this group of SLT learners (McAllister et al., 2013). In the current study, some second-professional-year students are trending towards exploring higher level reflective elements such as examining theories, bias, values and other perspectives ('re-evaluate', 'content' and 'premise'). Although, within this group of students, demonstration of such WRP skills were inconsistent over time. This further

reinforces the developing nature of higher level RP skills, and suggests this process could be similar to learning a new skill, where time can play a role in new skill acquisition (Duke & Appleton, 2000).

As a group, final-professional-year students demonstrated a higher proportion of higher level RP elements ('revaluates', 'content', 'premise', 'reflection-in-action') compared with first- and second-professional-year students. This finding further reinforces that some aspects of RP require time and repeated exposure (Cook et al., 2019; Duke & Appleton, 2000; Mezirow, 1991; Wong et al., 1995). Of significance was the increase in proportion of final-professional-year students demonstrating the elements 're-evaluate' (reappraises the situation vis-à-vis past experiences) and 'premise' (recognizes and explores own assumptions, values, beliefs and biases) by T4 of the final professional year. This finding may illustrate the students moving towards the description of 'reflective practitioner' required in the workplace, which supports workplace readiness as students make comparisons between past experiences, clients and evidence-based practice (Chabeli, 2010; Dowling, 2001; Hill et al., 2012; Plack et al., 2005; Reynolds, 1997; Russell, 2005; Schön, 1983, 1987; Williams et al., 2000).

Of interest to note is the specific time point where second and final-professional-year students demonstrated a high proportion the element of 're-evaluates' (reappraises the situation vis-à-vis past experiences). Both occurred during 'block placements' ('block placements' are typically described as full day clinical placements across a consecutive number of weeks). Several reasons should be considered for this finding. Firstly, it may be that the full-time clinical experience promoted higher levels of comparisons between clinical experiences and academic theory ('re-evaluates'). For example, on a full-time block placement one would typically expect that students spend more time in clinical practice and work alongside more clients compared with a part-time placement. As a result, this may contribute to an increased understanding of clinical issues, as well as the cumulative effect of more clients and experiences, from which to make comparisons between, in a shorter period of time. Second, perhaps the block placement better promotes internalization of reflection as a learning strategy. Finally, the greater autonomy given to the SLT students in their final weeks of the placement possibly had a positive impact on the demonstration of critical RP skills (Duke & Appleton, 2000; Dunne et al., 2019). This, however, warrants further investigation.

The finding of the current study of the complete absence of the 'reflection-for-action' element for final-professional-year participants, and significant reduction in proportion of students demonstrating the same element at T4 for first- and second-professional-year students was unexpected. No previous studies have reported this finding for the 'refection-for-action' element. Instead, this lower level RP element has previously been present for a high proportion of student WR (Cook et al., 2019; Hill et al., 2012; Plack et al., 2005). One suggestion is that this finding could be relative to all participants finishing their respective clinical placements. One might expect students on their final placements for the year, to continue to identify future learning opportunities, and thus support life-long learning practices. Rather, we suggest, that students may instead be signaling closure on the clinical experience, and evaluating their overall learning for the clinical placement via demonstration of the element 'reflection-on-action'. A final interpretation of this finding could suggest that students might RP as a requirement for the course, rather than a life-long learning strategy (Duke & Appleton, 2000; Dunne et al., 2019; Greenwood, 1998).

Implications for clinical education

The findings of this study have positive implications for both assessment and development of students' WRP skills including the provision of tailored support, formative feedback for students and promoting RP as a self-directed learning experience. This study has demonstrated that in general students do demonstrate an increase in proportion and type of breadth of WRP abilities over time across the clinical programme. This indicates a transfer of learning may exist for demonstration of WRP skills by SLT students. However, the variation across RP elements and time points for each professional year group suggests that clinical educators and field supervisors should first assess RP abilities, using the coding schema or its concepts, and then aim to foster development of RP abilities on an individual scale (Dunne et al., 2019; Plack et al., 2005). This also mirrors the individualized way that SLT work alongside clients in the field. For example, educators could use the student's first WR as a baseline for reflective ability and then plan to support, engage, and scaffold development of student RP abilities via use of formative feedback on the reflective processes used beginning with the low-level RP elements. Further examples of tailoring RP opportunities to the individual can be achieved by a focus on formative feedback, reflective questioning, and even directing students to a theme to focus on for the WR (e.g., comparison between familiar and unfamiliar clinical experience) in order to further develop and then evaluate RP abilities. When considering formative feedback, given the high proportion of low-level reflective elements ('return', 'attend' and 'reflection-on-action') exhibited by students,

particularly across the first-professional year, educators can feel confident in moving away from formative feedback and reflective questioning focused heavily on examining student emotions, feelings, and description of events for repeated clinical experiences, and direct reflective questioning toward higher level reflective elements such as 're-evaluate' and 'content'. Finally, this study reinforces that, WRP continues to provide students with another learning space promoting individualized and self-directed learning as well as time to deliberate after a session to supplement face to face discussions with educators (Cook et al., 2019; Dunne et al., 2019; Plack et al, 2008). WRP appears to provide a purposeful opportunity for examination of one's clinical and professional performance, growth and feelings, which may not arise in face-to-face exchanges.

Limitations and future directions

The current study has some limitations but provides suggestions for useful future research directions. The current study resulted in similar interrater reliability outcomes to past studies, specifically for the higher level elements of RP ('reflection-in-action', 'content', 'premise' and 're-evaluates'), despite a robust training package for the SLT coding the transcripts (Cook et al., 2019; Plack et al., 2005). This reinforces past suggestions that perfect interrater agreement is not achievable due to the individualized nature of WR, and the kappa equation underestimating reliability where few instances of a specific breadth element occur (Cook et al., 2019; Garrity et al., 2019; Plack et al., 2005; Viera & Garrett, 2005). As also suggested by the authors and others, the small number of students demonstrating higher level RP elements in writing may be due to the asynchronous nature of WRP (i.e., not occurring at the same time as the experience) or level of autonomy on clinical placement (Cook et al., 2019; Duke & Appleton, 2000; Plack et al., 2008). The nature of WRP activities, whereby students are looking back on the experience, combined with the guiding questions used for this study, yields important future research and clinical supervision considerations. Such as, exploring whether we are asking the right questions to promote and evaluate higher level RP thinking? In particular, are educators asking the right questions for the RP abilities of final-year students who are about to enter the workforce? Useful future directions to support enhanced engagement for SLT students may include, the role of formative feedback in developing WRP skills, the optimum amount of WRP activities and guiding question type for optimizing WRP and how WRP and RP activities transfer to SLT workplaces.

CONCLUSIONS

This study indicated a positive impact of time on the demonstration specific WRP skills for SLT students. Secondly, the study identified a positive trend for demonstrating a higher proportion of WRP breadth elements across the SLT degree programme. A usual practice, and consistent format of guiding questions, formative feedback on the student's process of reflection and real-life clinical placement experiences was used. The results support the continued use of WRP activities in clinical education programmes. WRP supports the theory of transfer of learning across clinical placements, offers a reliable way for the educator or clinician to first assess and then tailor reflective questions to foster student development of RP ability and remains a useful tool to use alongside face-to-face interactions with students (Cook et al., 2019; Sheepway et al., 2014). Finally, a number of questions remain unanswered including the role of feedback in developing WRP skills and how RP activities completed in clinical programmes transfer to SLT workplaces.

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CONFLICT OF INTEREST

The authors report no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Kate. J. Cook https://orcid.org/0000-0002-5083-5757

REFERENCES

Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J. & Wittrock, M.C. (2001) In: Anderson, L.W. & Krathwohl, D.R. (Eds.) *A taxonomy for learning, teaching, and assessing: a revision of bloom's taxonomy of educational objectives (complete edition)*. New York: Longman.

Aronson, L., Niehaus, B., Hill-Sakurai, L., Lai, C. & O'Sullivan, P.S. (2012) A comparison of two methods of teaching reflective ability in year 3 medical students. *Medical Education*, 46(8), 807–814. https://doi.org/10.1111/j.1365-2923.2012.04299.x

Bates, D., Mächler, M., Bolker, B.M. & Walker, S.C. (2015) Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1). 1–48. https://doi.org/10.18637/jss.v067.i01

Bloom, B.S. (1956) *Taxonomy of educational objectives, handbook I: the cognitive domain*. New York: David McKay Co Inc.

Boles, L. (2018) Predicting graduate school success in a speech–language pathology program. *Teaching and Learning in Communication Sciences & Disorders*, 2(2), Article 1.

Bransford, J.D. & Schwarts, D.L. (1999) Rethinking transfer: a simple proposal with multiple implications. *Review of Research in Education*, 24, 61–100.

Brookfield, S. (1986) *Understanding and facilitating adult learning: a comprehensive analysis of principles and effective practices*. UK: Open University Press.

Boud, D., Keogh, R., & Walker, D. (Ed.). (1985). Reflection: Turning Experience into Learning. New York: Nichols Publishing Company.

Bulman, C. & Schutz, S. (2013) *Reflective practice in nursing*, 5th edition, Oxford UK: Wiley-Blackwell.

Chabeli, M. (2010) Concept-mapping as a teaching method to facilitate critical thinking in nursing education: a review of the literatureeview of the literature. *Health SA Gesondheid*, 15(1), 7. https://doi.org/10.4102/hsag.v15i1.432

Chambers, S., Brosnan, C. & Hassell, A. (2011) Introducing medical students to reflective practice. *Education for Primary Care*, 22(2), 100–115.

Christensen, R.H.B. (2015) Ordinal-Regression Models for Ordinal Data. R package version 2015.1-21. https://cran.r-project.org/web/packages/ordinal/index.html

Colucciello, M.L. (1997) Critical thinking skills and dispositions of baccalaureate nursing students—A conceptual model for evaluation. *Journal of Professional Nursing*, 13(4), 236–245. https://doi.org/10.1016/S8755-7223(97)80094-4

Cook, K., Tillard, G., Wyles, C., Gerhard, D., Ormond, T. & McAuliffe, M. (2019) Assessing and developing the written reflective practice skills of speech–language pathology students. *International Journal of Speech–Language Pathology*, 21(1), 46–55. https://doi.org/10.1080/17549507.2017.1374463

Cruice, M. (2005) Common issues but alternative solutions and innovations. *Advances in Speech–Language Pathology*, 7(3), 162–166. https://doi.org/10.1080/14417040500181429

Domac, S., Anderson, L., O'Reilly, M. & Smith, R. (2015) Assessing interprofessional competence using a prospective reflective portfolio. *Journal of Interprofessional Care*, 29(3), 179–187. https://doi.org/10.3109/13561820.2014.983593

Dowling, S. (2001) *Supervision: strategies for successful outcomes and productivity*, 2nd edition, Boston, MA Allyn Bacon.

Duke, S. & Appleton, J. (2000) The use of reflection in a palliative care programme: a quantitative study of the development of reflective skills over an academic year. *Journal of Advanced Nursing*, 32(6), 1557–1568. https://doi.org/10.1046/j.1365-2648.2000.01604.x

Dunne, M., Nisbet, G., Penman, M. & McAllister, L. (2019) Facilitating the development and maintenance of reflection in speech pathology students. *Health Education in Practice: Journal of Research for Professional Learning*, 2(2). https://doi.org/10.33966/hepj.2.2.13579

Facione, N.C. (1997) *Critical thinking assessment in nursing education programs: an aggregate data analysis*. Millbrae, CA: The California Academic Press.

Garrity, A., Keck, C., Bradshaw, J.L. & Ishikawa, K. (2019) Toward the development of a quick, reliable assessment tool for reflective journals. *Teaching and Learning in Communication Sciences & Disorders*, 3(2), 1–19. https://doi.org/10.30707/tlcsd3.2garrity

Geller, E. (2002) A reflective model of supervision in speech–language pathology: process and practice. *The Clinical Supervisor*, 20(2), 191–200. https://doi.org/10.1300/J001v20n02_14

Greenwood, J. (1998) The role of reflection in single and double loop learning. *Journal of Advanced Nursing*, 27(5), 1048–1053. https://doi.org/10.1046/j.1365-2648.1998.00579.x

Harris, M. (2005) Is journaling empowering? Students' perceptions of their reflective writing experience. *Health SA Gesondheid*, 10(2), 47–60. https://doi.org/10.4102/hsag.v10i2.194

Hill, A.E., Davidson, B.J. & Theodoros, D.G. (2012) Reflections on clinical learning in novice speech–language therapy students. *International Journal of Language & Communication Disorders*, 47(4), 413–426. https://doi.org/10.1111/j.1460-6984.2012.00154.x

Johnston, G. & Banks, S. (2000) Interprofessional learning modules at Dalhousie University. *The Journal of Health Administration Education*, 18(4), 407–427.

Karpa, J.v. & Chernomas, W.M. (2013) Nurse educators' perspectives on student development of reflection for psychiatric mental health nursing practice. *International Journal of Nursing Education Scholarship*, https://doi.org/10.1515/ijnes-2012-0040

Landis, J.R. & Koch, G.G. (1977) The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159. https://doi.org/10.2307/2529310

Lim, P.H. & Low, C. (2008a) Reflective practice from the perspectives of the bachelor of nursing students: a focus interview. *Singapore Nursing Journal*, 35(4), 8.

Lim, P.H. & Low, C. (2008b) Reflective practice from the perspectives of the bachelor of nursing students in International Medical University (IMU). *Singapore Nursing Journal*, 35(3), 5.

Mamede, S., Schmidt, H.G. & Penaforte, J.C. (2008) Effects of reflective practice on the accuracy of medical diagnoses. *Medical Education*, 42(5), 468–475. https://doi.org/10.1111/j.1365-2923.2008.03030.x

McAllister, L. & Lincoln, M. (2004) *Clinical education in speech–language pathology*. London: Whurr.

McAllister, S., Lincoln, M., Ferguson, A. & McAllister, L. (2013) *COMPASS®: Competency assessment in speech pathology technical manual*, 2nd edition, Speech Pathology Australia.

Mezirow, J. (1991) *Transformative dimensions of adult learning*. San Fancisco: Jossey-Bass.

Middlemas, D.A., Manning, J.M., Gazzillo, L.M. & Young, J. (2001) Predicting performance on the national athletic trainers' association board of certification examination from grade point average and number of clinical hours. *Journal of Athletic Training*, 36(2), 136–140. https://go.exlibris.link/0MCC0BTj

Miles, M.B. & Huberman, A.M. (1994) *Qualitative data analysis: an expanded sourcebook*, 2nd edition, Thousand Oaks: Sage Publications.

Ng, S.L., Bartlett, D. & Lucy, S.D. (2012) Reflection as a tool for audiology student and novice practitioner learning, development, and self-care. *Seminars in Hearing*, 33(2), 163–176. https://doi.org/10.1055/s-0032-1311676

Plack, M., Driscoll, M., Blissett, S., McKenna, R. & Plack, T. (2005) A method for assessing reflective journal writing. *Journal of Allied Health*, 34(4), 199–208. https://doi.org/10.1097/00001416-200607000-00014

Plack, M., Dunfee, H., Rindflesch, A. & Driscoll, M. (2008) Virtual Action Learning Sets: a Model for Facilitating Reflection in

the Clinical Setting. *Journal of Physical Therapy Education*, 22(3), 33–42. https://doi.org/10.1097/00001416-200810000-00005

Reynolds, S.W. (1997) Journal writing in nursing. In: Poirrier, G. (Ed.) *Writing-to-learn: curriculum strategies for nursing and other disciplines*. Thousand Oaks: National League for Nursing Press.

Roche, A. & Coote, S. (2008) Focus group study of student physiotherapists' perceptions of reflection. *Medical Education*, 42, 1064–1070.

Russell, T. (2005) Can reflective practice be taught? *Reflective Practice*, 6(2), 199–204. https://doi.org/10.1080/14623940500105833

Schaub-de Jong, M., Schönrock-Adema, J., Dekker, H., Verkerk, M. & Cohen-Schotanus, J. (2011) Development of a student rating scale to evaluate teachers' competencies for facilitating reflective learning. *Medical Education*, 45(2), 155–165. https://doi.org/10.1111/j.1365-2923.2010.03774.x

Schön, D.A. (1983) *The reflective practitioner: how professionals think in action*. New York: Basic Books. https://go.exlibris.link/Ls1LSVPR

Schön, D.A. (1987) *Educating the reflective practitioner: toward a new design for teaching and learning in the professions*, 1st edition, San Francisco, CA: Jossey-Bass. https://go.exlibris.link/gc2w3xqd

Sheepway, L., Lincoln, M. & McAllister, S. (2014) Impact of placement type on the development of clinical competency in speech–language pathology students. *International Journal of Language & Communication Disorders*, 49(2), 189–203. https://doi.org/10.1111/1460-6984.12059

Team. R.C. (2015) A language and environment for statistical computing. from http://www.R-project.org/. In: *R Foundation for Statistical Computing* (Vol., 10, Issue 1). http://www.r-project.org/

Tillard, G.D., Cook, K., Gerhard, D., Keast, L. & McAuliffe, M. (2018) Speech–language pathology Student Participation in Verbal Reflective Practice Groups: perceptions of development, value, and group condition differences. *Teaching and Learning in Communication Sciences & Disorders*, 2(2). https://doi.org/10.30707/tlcsd2.2tillard

Tsang, A.K.L. (2012) Oral health students as reflective practitioners: changing patterns of student clinical reflections over a period of 12 months. *Journal of Dental Hygiene : JDH/American Dental Hygienists' Association*, 86(2), 120–129.

Tsingos-Lucas, C., Bosnic-Anticevich, S., Schneider, C.R. & Smith, L. (2017) Using reflective writing as a predictor of academic success in different assessment formats. *American Journal of Pharmaceutical Education*, 81(1), 1–8. https://doi.org/10.5688/ajpe8118

Viera, A.J. & Garrett, J.M. (2005) Understanding interobserver agreement: the kappa statistic. *Family Medicine*, 37(5), 360–363.

Walker, D. (1985) Writing and reflecting. In: Boud, D., Keogh, R., & Walker, D. (Eds.) *Reflection: turning experience into learning*, London: Kogan Page, pp. 52–68.

Williams, R.M., Sundelin, G., Foster-Seargeant, E. & Norman, G.R. (2000) Assessing the reliability of grading reflective journal writing. *Journal of Physical Therapy Education*, 14(2), 23–26. https://doi.org/10.1097/00001416-200007000-00005

Wong, F.K., Kember, D., Chung, L.Y.F. & CertEd, L.Y. (1995) Assessing the level of student reflection from reflective journals. *Journal of Advanced Nursing*, 22(1), 48–57. https://doi.org/10.1046/j.1365-2648.1995.22010048.x

Zimmerman, S., Byram Hanson, D., Stube, J., Jedlicka, J. & Fox, L. (2007) Using the power of student reflection to enhance professional development. *Internet Journal of Allied Health Sciences and Practice*, 5(2), 1–7. https://doi.org/10.46743/1540-580x/2007.1146

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APPENDIX A

TABLE A1 Coding schema for written reflective practice (WRP)

No.	Element (code)	Description of breadth elements	Key words/phrases	Sentence example	What it is not	Co-occurring elements	Guiding question where element may be identified
1	Returns to the experience (RETURN)	Describes the experience. Narrative retell/replay of the session ('in some detail'; Plack et al. 2005)	'Today's session'	'Today we did x, y, z today'	Listing items with no description of event	All can co-occur	What was your overall impression of the session?
2	Attends to feelings (ATTEND)	Acknowledges and begins to work with feelings. Needs to do more than state an emotion or feeling—give the why—some discussion of impact of emotion on situation (Plack et al. 2005)	Emotions, e.g., nervous, sad, happy, excited Feelings, tired, shy, interest	'I felt sad because …' 'I felt nervous because …'	'I was nervous for this session'—no why given	All can co-occur	What emotions can you remember feeling during the session? Did you observe or think about client emotions or behaviours during the session? What were your thoughts and feelings at the time of the incident?
3	Reflection on action (ROA)	Occurs after the action has been completed	'Learnt/learning'	'I did x, y, z and from this I learnt …'	Describing the event or Only describing what learnt (with no description of the event)	Must co-occur with either: return, attend	What things went well during the session and what did you learn from these? What things went wrong during the session and what did you learn from these? What have you learned, e.g., about yourself, relationship with others, the SLT task, organizational policies and procedures?

(Continues)

TABLE A1 (Continued)

No.	Element (code)	Description of breadth elements	Key words/phrases	Sentence example	What it is not	Co-occurring elements	Guiding question where element may be identified
4	Reflection for action (RFA)	Occurs before being faced with the situation; begins to plan for the future	'Next time/session' 'I should have' 'in the future' 'I will'	'I did x, y, z and next time I will …'	Describing the event or Only describing what will do next time (with no description of the event)	Must co-occur with either: return, attend	What things went well during the session and what did you learn from these? What things went wrong during the session and what did you learn from these? What do you need to learn or find out about before the next session? What future learning needs have you identified as a result of this incident? How might this be achieved?
5	Process (PROC)	Describes the strategies/clinical techniques used or available for use and the impact/or reason for use	Cues or strategies, e.g., stopwatch, cheat sheet, role play, questioning techniques 'I tried' 'I could have tried' 'reminded'	'I used x cues to …' 'I reminded the patient to use his loud voice' 'I could have used my information sheet to …'	Listing strategies/clinical techniques with no explanation of the why/what used for General mention of 'strategies' or 'processes'—need to be specific	Can co-occur with all other codes This is a significant correlation between premise and process co-occurring	What things went wrong during the session and what did you learn from these? Did you observe or think about client emotions or behaviours during the session? Did the session follow your plan? Why or why not? What do you need to learn or find out about before the next session? What are the areas you feel you need to develop further about yourself and your communication?

(Continues)

TABLE A1 (Continued)

No.	Element (code)	Description of breadth elements	Key words/phrases	Sentence example	What it is not	Co-occurring elements	Guiding question where element may be identified
6	Reflection in action (RIA)	Occurs while in the midst of an action; on-the-spot decisions or experiment. The impact of the change will be described Distinguishing feature: the immediate significance for action. Ask yourself: did they make a difference to the situation at hand? (Schon 1987)	'During' 'Change' 'In the middle/moment' 'and this meant'	'In the moment I changed …' 'I decided to change xx during the session as … or…the result was'	Describing what learnt (ROA) Describing what to do next time (RFA)	Must co-occur with either: return, attend	What things went wrong during the session and what did you learn from these? What things went well during the session and what did you learn from these?
7	Content (CON)	Explores the experience from another perspective (beyond description), for example patient, client, family or supervisor New understanding of an event (updated from Plack et al. 2005, similar to Hill et al.'s, 2012, definition)	'point of view' 'different beliefs'	'Another way I could look at this is …' 'From my client's/supervisor/p point of view …' "I think the patient felt …this was because … The result was/this meant I needed to …"	A statement of emo-tions/feelings and the impact this had (attend), e.g., 'I thought about how I would feel if I had 5 students observing me and know that I wouldn't like it at all!'	Can co-occur: Return likely as they describe the situation Re-evaluate	What things went wrong during the session and what did you learn from these? Did the session follow your plan? Why or why not? What are your thoughts and feelings now about this incident? What were the responses of the other key people to this incident? If not known, what do you think they might have been?

(Continues)

TABLE A1 (Continued)

No.	Element (code)	Description of breadth elements	Key words/phrases	Sentence example	What it is not	Co-occurring elements	Guiding question where element may be identified
8	Re-evaluates (RE-EVAL)	Reappraises the situation vis-à-vis past experiences New understanding of an event	'last time/patient … this time' 'I could have … this would have'	'In the past I have done x, I used this again and the result was …' 'I used my previous knowledge from clinical notes at this hospital to help orientate myself on how to set these notes out'	Stating textbooks, clinical notes, lecture notes, e.g., 'I used my lecture notes to help me know what to expect'—needs to be specific and give the comparison from learning to current experience	Can co-occur: Return likely as they describe the situation Content	What theoretical knowledge did you use or could have used during this session? What past experiences did you use or could have used during this session? Are there ways in which this incident has led (or might lead to) changes in how you think, feel or act in particular situations? What are your thoughts and feelings now about this incident? What theory (or theories) has (or might have) helped develop your understanding about some aspect of this incident?
9	Premise (PREM)	Recognizes and explores own assumptions, values, beliefs and biases New understanding of an event So what, now what?	'my opinion' 'my family values' 'assumption' 'belief' 'before I met the patient I thought … instead'	'I had thought all clients/parents would want to … As this is the way I would do it … however now I can see another side/understand why this is important for them which is …'	Description of the assump-tion/value/bias/beli given—no change/confirmatio of perspective given	Can co-occur: Return likely as they describe the situation This is a significant correlation between premise and process co-occurring	What emotions can you remember feeling during the session? What impact do you feel your own assumptions, values, beliefs or biases may have had on the session or observation? What are your thoughts and feelings now about this incident? What are the values and ethical issues which are highlighted by this incident?

Note: Breadth = made up of reflective practice elements that can be identified at the word, sentence or paragraph level. Elements are organized by level of RP, with 1 = lowest level of RP.
Sources: Modified from Pack et al. (2005) (first modification for Cook et al. 2019, second modification by Cook et al. 2020).

APPENDIX B

TABLE B1 Clinical education programme of learning for reflective practice by year group and semester

Professional year	First	First	Second	Second	Third/final	Third/final
Semester	One	Two	One	Two	One	Two
Reflective practice (RP) education						
Full class teaching: group reflections (what went well, what was surprising, what would you do next time), dialogic teaching, Journal article discussion: topic RP	X	X	X		X	
Mentoring/peer learning		Mentee				Mentor
Reflective discussions with clinical educator pre- and/or post-clinical interactions (small group or one on one)		X	X	X	X	X
Verbal RP group: one per week; 50-min duration				X		X
Written RP: one per week; formative feedback given		X		X	X	X
Written RP: assessment; summative feedback given	X	X	X	X	X	X
Type and sequence of questions used for written RP[a]	Set 1	Set 2	Sets 2, 3	Set 2	Set 2	Sets 2, 3
Clinical practice requirements[b]						
Observation placement	12 weeks					
Part-time placement		12 weeks	6 weeks	12 weeks	12 weeks	6 weeks
Block placement: full time			5 weeks			12 weeks

Notes: X indicates the type of RP activity completed.

[a]See Appendix C for a full list of questions used as part of standard practice for the clinical education programme.

[b]An observation placement is one whereby students are not actively involved in SLT, a part-time placement is completed in conjunction with academic teaching requirements, a block placement is a full-time placement (i.e., 40 h per week) with no academic teaching requirements (McAllister et al., 2013).

International Journal of Language & Communication Disorders

APPENDIX C

TABLE C1 Guiding questions used for WRP

Set 1	Set 2	Set 3[c]
What happened?	What was your overall impression of the session?[a]	*Account of the incident*
Brief summary of what you did, what you talked about, any new experiences	What things went well during the session and what did you learn from these?[a]	What happened, where and when; who was involved?
What did not go well and why?	What things went wrong during the session and what did you learn from these?[a]	What was your role/involvement in the incident?
Explain what you learned from this	What emotions can you remember feeling during the session?[a]	What was the context of this incident, e.g., previous involvement of yourself or workplace staff with this client/client group?
What next?	What did you observe or think about client emotions or behaviours during the session?	What was the purpose and focus of your contact/intervention at this point?
What have you learned from this visit and how will this experience influence your future interactions?	Did the session follow your plan? Why or why not?[a]	*Initial response to the incident*
Think about specific actions and how you are going to put them into practice, describe any resources you might need	What theoretical knowledge did you use or could have used during this session?[a]	What were your thoughts and feelings at the time of the incident?
	What past experiences did you use or could have used during this session?[a]	What were the responses of the other key people to this incident? If not known, what do you think they might have been?
	What do you need to learn or find out about before the next session?[a]	*Issues and dilemmas highlighted by this incident*
	What impact do you feel your own assumptions, values, beliefs or biases may have had on the session or observation?[b]	What practice dilemmas were identified as a result of this incident?
		What are the values and ethical issues which are highlighted by this incident?
		Are there any implications for your collaborations with any of the following?
		Clients, Their family members, Peers, Supervisors, SLT clinicians, Inter-disciplinary team members
		Learning
		What have you learned, e.g., about yourself, relationship with others, the SLT task, organisational policies and procedures?
		What theory (or theories) has (or might have) helped develop your understanding about some aspect of this incident?
		What future learning needs have you identified as a result of this incident? How might this be achieved?
		Outcome
		What were the outcomes for the various participants?
		Are there ways in which this incident has led (or might lead to) changes in how you think, feel or act in particular situations?
		What are your thoughts and feelings now about this incident?

Sources: [a]McAllister & Lincoln (2004)

[b]Plack et al. (2005)

[c]Crisp et al. (2005).