Journal of University Teaching & Learning Practice

Volume 17 | Issue 3 Article 11

2020

Teaching and learning effective reflective practice for learning at work: Evaluating delivery and application of the STOP tool

Matthew Muscat-Inglott
Malta College of Arts, Science and Technology, Malta, matthew.muscat.inglott@mcast.edu.mt

Recommended Citation

Muscat-Inglott, M. (2020). Teaching and learning effective reflective practice for learning at work: Evaluating delivery and application of the STOP tool. *Journal of University Teaching & Learning Practice, 17*(3). https://doi.org/10.53761/1.17.3.11

Teaching and learning effective reflective practice for learning at work: Evaluating delivery and application of the STOP tool

Abstract

This paper explores the design, delivery and evaluation of a new bespoke reflection tool for enhancing informal learning in the workplace via reflection in and on action, as part of an undergraduate reflective practice course component. The rationale underlying the tool is presented first, followed by the results of a mixed-methods study evaluating its delivery and application in practice. Although consistently overestimating their ability to do so, participants ultimately demonstrated only a moderate degree of success in their application of the tool, and experienced greater challenges applying it specifically for reflection in, as opposed to on, action. Favourable reports on the general usefulness of the tool, and various suggestions for improving it were made. The tool is finally presented as a promising resource in the context of longer-term scaffolded interventions for more effective teaching and learning of reflective practice in a wide range of higher education settings.

Keywords

experiential learning, workplace learning, informal learning, reflective practice, reflection tools, reflecting in action, thinking in action

Journal of University Teaching & Learning Practice

Volume 17 | Issue 3 Article 11

2020

Teaching and learning effective reflective practice for learning at work: Evaluating delivery and application of the STOP tool

Matthew Muscat-Inglott
Malta College of Arts, Science and Technology, Malta, matthew.muscat.inglott@mcast.edu.mt

Teaching and learning effective reflective practice for learning at work: Evaluating delivery and application of the STOP tool

Abstract

This paper explores the design, delivery and evaluation of a new bespoke reflection tool for enhancing informal learning in the workplace via reflection in and on action, as part of an undergraduate reflective practice course component. The rationale underlying the tool is presented first, followed by the results of a mixed-methods study evaluating its delivery and application in practice. Although consistently overestimating their ability to do so, participants ultimately demonstrated only a moderate degree of success in their application of the tool, and experienced greater challenges applying it specifically for reflection in, as opposed to on, action. Favourable reports on the general usefulness of the tool, and various suggestions for improving it were made. The tool is finally presented as a promising resource in the context of longer-term scaffolded interventions for more effective teaching and learning of reflective practice in a wide range of higher education settings.

Keywords

experiential learning, workplace learning, informal learning, reflective practice, reflection tools, reflecting in action, thinking in action

Introduction

For three successive years, I was tasked with delivering and assessing an undergraduate unit/subject based on continuing professional development and lifelong learning as part of a health course in a higher education institution in Malta. It involved a strong reflective practice component, with a particular learning outcome and associated assessment criteria based on the use of reflective tools to enhance on-going learning. In this paper, an initial reflective appraisal of my first two years delivering and assessing this unit is presented to frame the research problem. In a bid to more closely incorporate reflecting-*in*-action into the unit, which had been lacking during the first two years, a new bespoke reflection tool was developed and implemented in the third year. A detailed rationale underlying the design and delivery of this new bespoke reflection tool is therefore provided. The procedure and findings of a mixed-methods study designed to evaluate its effectiveness in terms of both delivery and application are presented and discussed in the broader context of teaching and learning reflective practice in higher education settings.

Scope

The original unit included a basic overview of experiential learning and reflective practice theory, focusing on the use of reflection tools in the tradition of Schön's (1983) notions of reflection *in* and *on* action. In accordance with existing research on the use of reflection tools, the content included methods such as, guided reflective journal writing (Boutete, Vandette & Valiquette-Tessier 2017; Bruno & Dell'Aversana 2017; Holtom & Kenworthy-U'Ren 2006; Wium & Plessis 2016), guided discussions among members of communities of practice (Zahid & Khanam 2019), and on-going self-assessment using worksheets, criteria checklists or rubrics (Anbarasi, Vijayaraghavan, Latha, Kandaswami & Kannan 2019; Solheim, Plathe & Eide 2017; Wium & Plessis 2016).

For the first two years I had compiled a compendium of deliberative self-directed questions for use by the students either individually or collaboratively in written or group-discussion exercises. The compendium was initially based on the Borton (1970) and Gibbs (1988) reflective cycles, and later expanded to incorporate a number of additional theoretical and conceptual perspectives, including questions inspired by Yeganeh and Kolb's "socio-cognitive mindfulness" (2009, p. 8) for enhancing judgment, Wallace and Jefferson's portrayal of critical thinking as a form "conscious quality controlled thinking" (2013, p. 248), and De Bono's (1990) lateral thinking tools. For their final assessment, the students were asked to recall a formative or otherwise significant work-related experience, episode or situation from their past and draft a brief reflective essay guided by a selection of questions from the compendium.

Exercising my own propensity towards reflective practice, I could not help but recognise that while my delivery of the content had been faithful to Schön's notions of reflection *on* and *in* action, my assessment of it had not. The reflective essay, in this sense, enabled assessment of students' use of a reflective tool for reflection-*on*-action (ROA), but not reflection-*in*-action (RIA). Also, since the compendium was in fact a *combination* of various reflective models and theoretical perspectives, it could not be considered a singular reflective tool in its own right. In preparation for my third academic year delivering and assessing the unit, I set about developing a more practical and distinctive tool, applicable in the context of work for ROA *and* RIA. Before setting out the theoretical underpinnings of the new tool in detail, however, some of the main working definitions used in this paper are clarified for the purpose of disambiguation.

Prior to Schön's more nuanced qualification of reflection as a phenomenon occurring either *in* or *on* action, Dewey (1910) had originally discussed the importance of suspending judgement or overcoming the "inertia" characteristic of on-going and relatively impulsive/unchecked thinking processes. He thus portrayed *reflective* thinking as a concerted effort to inquire further, to stop and think more purposefully, systematically, or "thoroughly" about a given situation or problem. ROA and RIA are therefore defined in this paper as *purposeful* and *systematic* forms of thinking and differentiated primarily according to their temporality. In RIA, the reflection (thinking purposefully and systematically about something), and the action (being immersed in a specific situation or episode in which one is presently compelled to act/do), occur simultaneously. In other words, in ROA the reflection is *not* taking place at the same time as the action (but rather, either before or after it), while in RIA, it is.

Theoretical underpinnings of the new tool

Coaching reflection and the use of tools

Seibert recognised that while slower more deliberative forms of reflection (ROA), can indeed be "coached", and are amenable to the use of reflection tools, there also exist more "unstructured" forms of reflection that emerge naturally and spontaneously, "in the midst of experience" (1999, p. 57), or, "thinking on [one's] feet" (Fox, Campbell & Hargrove 2011, p. 38). In his comprehensive work on informal learning in the workplace, Eraut (2004) used the, perhaps more apt, term; *thinking*-in-action, since *reflecting* is, at least from the Deweyan perspective, typically both *purposeful* and *thorough*, rendering the possibility of *reflecting* while immersed *in-action*, somewhat contradictory.

Seibert's solution was a coaching strategy based on *indirectly* altering or "cultivating" conditions in the external environment influencing this form of thinking. Given that work environments are typically structured primarily for the performance of work, rather than the facilitation of learning (Eraut, 2004), however, a tool applied *directly* and individually by professionals appears more practical, since the need for possibly disruptive or costly organisational or environmental changes is avoided. A tool that upon its delivery constitutes a form of *coached* reflection, is directly applicable *in* action, and introduces an element of *purpose* to the thinking occurring therein, would essentially transform, or elevate, the *thinking* in 'thinking-in-action' to a form of *reflecting (*ergo, '*reflecting*-in-action'*)*.

In the context of learning, the purpose of a traditional tool for ROA seems clear, inasmuch as reflections of this kind are generally expected to yield deeper insights about a given situation or episode and enhance relevant contextualised knowledge. Given the unique circumstances in which RIA occurs, the purpose of a prospective tool can, in principle, be construed as two-fold. In behaviourist terms, education and learning strategies typically embrace the notion of positive, as opposed to negative reinforcement, with educators generally preferring to support learning processes by emphasising learners' successes, rather than their failures. In this sense, the two-fold purpose of an effective tool for RIA would emphasise not only learning itself, but also favourable outcomes in a practical sense. In other words, given that learning from episodes at work need not necessarily equate to learning from one's *mistakes*, an ideal tool for RIA would have two goals; first, to facilitate an optimal outcome/resolution of the situation at hand, and second, to learn from the episode as a *positive*, as opposed to a *negative*, experience.

Fundamental design considerations

According to Lev Vygotsky (1896-1934), thoughts are "*completed* in the word" (Vygotsky 1987, p. 252), rendering the use of words a compelling basis for guiding purposeful reflection. While all forms of linguistic expression can be said to interplay with forms of thinking, he described *written* "speech" as a maximally "expanded" (1987, p. 272) form of thinking, permitting maximum deliberation by the thinker, when compared to *spoken* speech, which is quicker. Without the need for conversion into audible speech via various necessary physiological processes, internal or *inner* speech, represents the quickest and most abbreviated version in the spectrum. In terms of the availability of time, *reflective writing* would represent one end of Vygotsky's implied linguistic-thinking spectrum (expanded), and *inner speech* the other (contracted).

Schön's classic conceptual differentiation between ROA and RIA, in this sense, can be mapped to Vygotsky's spectrum, where episodes of deep and purposeful deliberation, characterised by an availability of sufficient time, permit the use of maximally *expanded* forms of thinking (like reflective journal writing), while novel unfolding episodes in which professionals must act, characterised by a lack of available time, would require what could be described as maximally *contracted* forms of thinking, like inner speech or self-talk. An effective tool for *both* ROA and RIA would therefore need to permit mobility in its use across Vygotsky's spectrum, by facilitating expansion and contraction of thinking at will. The versatility of a reflective tool specifically capable of incorporating RIA, is therefore predicated on the identification of a specific and maximally *contracted* form of thinking, with the possibility of expansion duly retained.

Theoretical assumptions for a bimodal reflection tool

In the context of mathematical reasoning, beyond the limitations of linguistic thinking altogether, Shihu and Fang (2011) presented their thesis on *visual thinking* by arguing on the basis of "cognitive cost": they defined visual thinking as the "most sensitive and efficient sensory tool" for perceiving and interacting with the world, capable of enlisting "higher cognitive activities" at lower *cognitive cost* (p. 4243). The term *higher-order* implies here, according to Bloom's (1956) original taxonomy, a form of thinking that supports and promotes learning via the "higher" pursuits of analysis and evaluation as opposed to comparatively basic forms of understanding or recall. The "considerable materials" provided via an initial *visual* survey of information would allow "further cognitive processes" to ultimately yield greater "knowledge accumulation" (Shihu & Fang 2011).

In the context of time-constrained episodes at work, where finite cognitive resources are available, a form of visual thinking may be effectively applied to consider more information about the situation in less time (incurring *lower cognitive cost*). In this way, at least hypothetically, more cognitive resources are made available for higher-order thinking processes. As such, a reflective tool for RIA based on an initial and effective form of *visual* thinking could better enable an elevated cognitive achievement (and more *knowledge accumulation*). Instead of basing a reflective tool on the recollection of set sequences of self-questions, as would be entirely appropriate for ROA, it could instead be based on the recollection of visual imagery, or at least the momentary recollection to conceptualise a given situation as it unfolds in a more visual way. While such a strategy would, according to Vygotsky's spectrum, effectively constitute a form of *contracted* thinking conducive to RIA, it does not preclude, subject to the availability of sufficient time, the possibility of transforming into more *expanded* forms of thinking conducive to ROA.

The notion of *perceptual positions* in the field of neuro-linguistic programming (NLP), which has been used as a psychological intervention in medicine, sports, and education settings (Savardelavar & Kuan 2017, p. 50), presented at least one evidence-based solution for the application of visual conceptualisation in the context of RIA. Perceptual positions refer to the specific vantage points (*self*, *other*, and *observer*) from which subjects (visually) conceptualise, recall, or project given experiences in the present, past, or future. Imaginatively shifting perceptual positions has been shown to alter people's responses in terms of their visual, auditory and kinaesthetic experiences of a given situation (Andreas & Andreas 2009).

Shifting specifically to the *observer* position, or "fly on the wall" (White, Duckworth & Kross 2015, p. 1273), during a given situation or episode represents an application of the kind of visual thinking described by Shihu and Fang. This is akin to a quick survey of the 'big picture', taking in a substantial amount of information at little cognitive cost, or at least more information about the situation and actors involved than would have otherwise been available. Shifting position, 'breaking away', or 'dissociating' from the self, is also referred to as "self-distancing" (Grossmann, Sahdra & Ciarrochi 2016). The ability to "take a step back" (White et al, 2015, p. 1272), and be *self-distanced* as opposed to *self-immersed*, has been shown to elicit specific physiological responses, including increased resting heart-rate variability, which has in turn been correlated with increased frontal cortex activation and heightened executive function (Grossmann et al 2016). If self-distancing lowers emotional and physiological reactivity (Ayduk & Kross 2010; White et al 2015) and improves executive function, then employing visual thinking via shifting to the perceptual position of the *observer* represents an enticing strategy for a prospective reflective tool designed for use during rapidly unfolding situations at work.

To achieve both knowledge accumulation *and* an optimal resolution of the situation at hand, the reflective tool would need to provide professionals with a means, upon having successfully activated a form of visual thinking, of maximising the cognitive processes that follow. For this, additional information would need to be encoded in the tool to encourage professionals to 'notice' or 'pay attention to' specific potentially fruitful or propitious aspects of the initial visual survey. Knowledge of the tool in memory, therefore, would need to include prompts to both shift perceptual position *and* consider specific aspects of the resulting visual image.

Since mnemonics are considered a valuable technique for encoding new information for easy retrieval (Mocko, Lesser, Wagler & Francis 2017, p. 2), I set about finalising the new bespoke tool by encoding relevant information in a suitable mnemonic. Although linguistic in nature, the mnemonic technique was intended to assist the students in *memorising* the elements of the tool, such that their easy retrieval and *application* would be maximally contracted, and *not* linguistic/expanded. The word "STOP" was selected in an attempt to prompt recollection of the tool in situations and episodes when the students would have otherwise been inclined to *stop and think*. The STOP mnemonic has also been used in a similar context as a mindfulness technique, drawing on a number of alternative key terms aimed at enhancing momentary awareness (Passmore 2017). Once effectively committed to memory, recollection (and application) of the tool would ideally become increasingly automated rather than deliberative. For a version of the STOP mnemonic applicable in the context of RIA, I summarised and pegged a number of themes from my own doctoral research (Muscat 2019), to the keywords: *Self-concepts*, *Trust*, *Observation*, and *Time and place*.

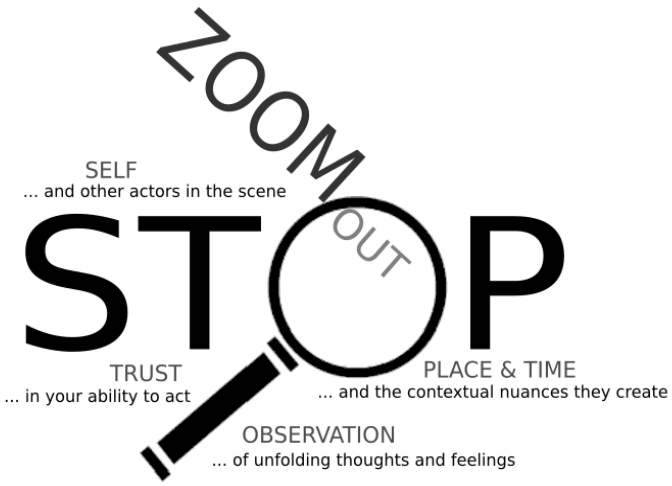
Component themes of the STOP tool

Based on the premise that one's concept of self acts as an influential factor over one's thoughts and behaviours, the notion of *Self-concepts* was intended to encourage the students, upon effectively self-distancing, or *zooming-out*, during a given unfolding situation to see themselves as one actor among others. Building on the "scene from a movie" analogy in NLP (White et al, 2015, p. 1274), students should have an immediate sense of familiarity with the characters and any associated expectations about probable favourable interactions between them given the relevant contextual identity-related nuances at play.

Based on Carruther's thesis on the illusory nature of conscious volition, whereby one "routinely experiences oneself as entertaining thoughts of various kinds" (2017, p. 248), and the notion of thinking as a subjective experience of which we are merely *phenomenally* conscious, together with Eraut's (2004, p. 256) paradox, which suggests that overall competence among professionals appears primarily dependent on implicit rather than explicit processing, students would be encouraged to *Trust* that, given the opportunity to proceed optimally and unencumbered by emotional reactivity, their thoughts would draw on all available implicit and explicit knowledge relevant to the situation at hand, and arrive at maximally advantageous outcomes, within the permissible limits of their existing capabilities and potential. In this sense, given that within a visual survey of the situation, phenomenal consciousness would also afford students special access to 'seeing' their *own* thoughts and feelings among all other ongoing factors in play, they should carefully *Observe* such initial thoughts and feelings in the context of the wider unfolding scene and everyone else in it, to similarly permit their unencumbered management towards the facilitation of optimal desirable outcomes.

And finally, students would be encouraged to further establish context by considering, from a maximally *zoomed-out* perspective, their position in terms of *Place and Time*. The place in which the situation unfolds could thereby be seen as a place among other places where expectations may vary, and as occurring within specific timelines, in moments that are often characterised by their position in relation to past and future moments. The STOP tool was finally summarised and presented using the following visual aid presented in Figure 1.

Figure 1: Lecturing resource for visual presentation of the STOP tool



The STOP visual aid was designed to avoid indicating any preferred ordering or sequencing of the components. The magnifying glass was integrated as the letter "O" into the "STOP" command together with the words "zoom out", in an attempt to illustrate the desired simultaneity of *stopping to think* and *zooming out*. The elements comprising the STOP mnemonic were then positioned close to the letters they represent. Considering the STOP elements as naturally and effortlessly as one would typically notice brightness, hues, movement, and depth in a visual image, would represent a maximally contracted and ideal application of the tool. In this sense, the above visual aid (Figure 1) was designed to portray components that could be applied in a rapid and maximally contracted fashion (as in RIA), while remaining suitably expandable subject to sufficient availability of time (as in ROA).

Questions

Satisfied with a working set of theoretical underpinnings, I eventually consolidated and delivered the STOP tool in class during a single two-hour lecture. All the components and themes were presented and discussed, and examples given of various situations appropriate for use of the tool in both ROA and RIA modes. Students were finally briefed to use the STOP tool for RIA during at least one episode or situation over the subsequent ten-day period, and once for ROA based on any formative or otherwise memorable experience, situation or episode from their past. These reflections were then to be described in an essay for assessment purposes. Given that the STOP tool was not an established tool extracted from the literature, and was instead constructed using a set of theoretical assumptions tailored to the very specific requirements of the unit and the students in attendance, as well as delivered within a relatively tight time frame, the scope of the present study became driven by the single main question;

How effective would this reflection tool ultimately be when applied by the students in practice?

As my planning and preparation for delivery and assessment of the unit progressed, the question became more nuanced, and was finally articulated in a more specific set of workable research questions, as follows:

1) How effectively are students able to use the STOP tool in practice in both ROA and RIA modes?
    a) Do they understand the difference between ROA and RIA, by recognising appropriate situations for using the tool?
    b) Are they able to be self-critical as a result of using the tool?
    c) Which specific components (zooming out, considering self and others, etc.) of the tool are they most able to apply in practice?
2) Are there any differences between my own and students' perceptions of their understanding and application of the STOP tool?
3) What are students' own subjective experiences of using the tool, and what suggestions/feedback might they provide in terms of its nature, relevance and how it was taught?

Method

As a form of initial field-testing for the tool, a mixed-methods approach spanning three distinctive phases mapped to each question was planned for the five-month period between early February and early June, 2019. In their study of reflective practice among psychology undergraduates, Boutete et al (2017) carried out their analyses on written reflective accounts and a final essay describing participants' experiences of reflective writing, judged on the basis of a framework of themes to help determine the extent to which participants were able to be reflective. Bruno and Dell'Aversana (2017) similarly employed a method based on written reflective journal entries and the use of rubrics. Since the STOP tool was based on a set of theoretical assumptions constituting indicators of reflective capacity in and of themselves, a combination of reflective essay analysis in conjunction with a distinctive rubric system was planned for Questions/Phases 1 and 2.

Phase 1

The entire cohort attending the continuing professional development and lifelong learning unit in my third year of delivery consisted of a total of 35 students, 27 of whom eventually completed the unit assessment and consented to participate in Phases 1 and 2 of the study. In terms of sampling strategy, therefore, *all* members of the cohort population were targeted for participation. The 27 essays, detailing a total of 54 reflections (27 for ROA and 27 for RIA), constituted a relatively substantial amount of initial data, influencing the selection of a quantitative approach in order to identify, explore, and determine any emerging trends in terms of their statistical significance.

A five-point scale where a score of one would be equivalent to applying the tool "not at all well", and five would represent applying it "very well" was considered a simple, clear and ideal way of quantifying judgments on each documented essay. Doing this fairly, consistently, and systematically, required the design of some basic instrumentation in the form of a combined *criteria checklist* and *rubric*. The checklist consisted of a set of seven selected criteria closely pegged to the original theoretical assumptions underpinning the STOP tool, elucidated in the previous sections. Based on the achievement of these criteria, each reflection could then be awarded a five-point score based on the descriptors set out in the accompanying rubric. The seven selected criteria (unpacked and justified in more detail below) to be initially ticked off on the checklist for each documented reflection during the first phase of analysis, therefore, were:

1) Identify an appropriate situation (in or on which) to use the tool
2) Be self-critical
3) Zoom-out/self-distance
4) Consider self and others
5) Trust oneself
6) Observe initial thoughts and feelings
7) Consider place and time

The first two criteria were intended as indicators of the appropriateness and overall quality of each documented reflection. Firstly, given the challenges of designing a reflection tool applicable specifically in the RIA context, it had been of some concern whether students would indeed succeed in recognising appropriate situations to use the tool in this mode, making situation-recognition perhaps the most crucial criterion of all. Secondly, retaining a fundamentally Deweyan perspective on the general enterprise of reflective thinking, the ability to suspend initial

judgment in favour of a more thorough, and essentially *critical* (a term similarly used throughout his original 1910 narrative on *How to Think*) form of thinking, represented an important factor in determining the quality of the students' reflections. In other words, were students merely *justifying* their actions or actively challenging themselves by being *self-critical*?

The remaining five criteria were pegged to students' application of the actual practical *components* of the tool, namely, the ability to effectively zoom-out (Criterion 3), and to note all of the stipulated aspects of the resulting visual image encoded in the STOP mnemonic (Criteria 4 to 7). It is worth noting here, that while *all* seven elements may not transpire to be entirely relevant in *every* reflection, mere *consideration* of each would at least be required to establish the extent to which the tool was indeed applied effectively and in its entirety, for the purposes of the study. Ultimately, these criteria were seen to represent the best fit for informing the rubric and moderating the development of more systematic, consistent, unbiased, and ultimately *refined*, final scores for each reflection. These were designated the *Final Effectiveness Scores* (FES), and established using the rubric outlined below in Table 1:

Table 1: The rubric used for determining final scores.

Score	Applied the tool...	Descriptor
1	Not at all well	Failed to identify an appropriate situation for effective use of the tool
2	Not well	Used two or less components of the tool, and was not self-critical
3	With only moderate success	Used three or more components of the tool, and was not self-critical
4	Well	Used at least three components of the tool and was self-critical
5	Very well	Used all components of the tool and was self-critical

Phase 2

Following the calculation of FES for each of the 54 documented reflections in both RIA and ROA modes to address Question 1, the 27 participants were then each asked to provide three S*elf-Assessed Scores* (SAS), based on a comparable five-point scale. Participants were asked to rate, on a scale from one to five, where; 1 = "Not at all well", 2 = "Not very well", 3 = "Not sure how well", 4 = "Well", and 5 = "Very well", the extent to which they:

1) Understood the reflection tool delivered in class (SAS-Und)
2) Applied the tool in practice for ROA (SAS-ROA)
3) Applied the tool in practice for RIA (SAS-RIA)

It would now be possible to compare the five-point FES values representing *my* subjective (yet consistent and systematic) judgments of the effectiveness of participants' reflections, with the five-point SAS values representing *their* subjective judgments of effectiveness. With a full set of variables in hand (FES-RIA, FES-ROA, FES-Mean, SAS-RIA, SAS-ROA, SAS-Mean, and SAS-

Und, as well as the original checklist values for each reflection), the data were finally entered into a statistical analysis software package (GNU PSPP 1.0.1), and a number of statistical tests run, including paired-samples T tests and Chi square tests to search for statistically significant differences between the main variables to address Question 2. A confidence interval of 95% was used to determine statistical significance.

Phase 3

To address Question 3, a small group of students were invited to participate in a 30-minute focus group discussion, led directly by the researcher, and held *after* the participants had received their marks for the reflective essays. Invitations were extended to all 27 participants from Phases 1 and 2 to participate. While focus group interviews will generally include six to eight participants (Creswell, 2014), a minimal size was sought to facilitate added depth and complement the mainly quantitative approach employed in Phases 1 and 2. The focus group interview was initiated with the first six students to provide consent, with five participants eventually completing the interview in its entirety. The focus group discussion was aimed at addressing three main points: (1) Participants' general experiences and comments about using the tool, (2) What they would change about the tool itself, and (3) What they would change about the way it was taught. The discussion was audio-recorded, transcribed, and analysed using a basic form of interpretive phenomenological analysis (IPA) in the tradition of Smith and Osborn (2008). Interpretive annotations were made on the transcript and used as a basis for subsequent theme development and construction of a final composite narrative.

Results and discussion

Phase 1

A representation of the entire data set for Phases 1 and 2 is included in Appendix 1. Overall, the mean FES for general application of the STOP tool in either mode was 2.80 (SD=1.10), which meant, according to the original five-point scale, students ultimately fell short of being able to apply the tool "well". The goal of teaching a reflection tool to a standard that facilitated its *effective* application among the participants according to my own subjective judgment as developer of the tool, lecturer, and assessor, therefore, was achieved with only a moderate degree of success. While the participants fared better applying the tool in ROA mode (M=3.15, SD=1.29), the added difficulty associated with applying it in RIA mode (M=2.44, SD=1.45), was clearly evident. While students performed relatively well using the tool in ROA mode, their overall effectiveness was limited by their difficulties with the RIA modality, specifically.

A look at the total counts for use of individual components of the tool indicated that the participants were most able to select appropriate situations for ROA (n=25), and least able to zoom-out (n=8) and be self-critical (n=8) during RIA, indicating more specifically where the strengths and difficulties occurred. Differences in application of the various individual components of the tool became apparent when used in ROA and RIA modes respectively, so a series Chi-square tests were run to investigate the statistical significance of these modal differences. The frequencies of effective application of each component of the tool in either ROA or RIA mode are indicated in Table 2, with continuity corrected Chi-square and p values indicated in the final column.

While the students were able to select appropriate situations for ROA most of the time, they were not able to do this for RIA (X^2=16.03, DF=1, p<0.001), suggesting that a revised method of

teaching the STOP tool would need a special focus on when and where to apply the tool specifically in RIA mode.

Table 2: Differences between application of components in ROA and RIA modes.

Component	ROA	RIA	X^2 (DF=1)
Appropriate situation	93% (n=25)	41% (n=11)	16.03 (p<0.001)
Zoom-out	48% (n=13)	37% (n=10)	0.30 (p=0.58)
Self	63% (n=17)	81% (n=22)	1.48 (p=0.22)
Trust	70% (n=19)	85% (n=23)	1.68 (p=0.33)
Observe	67% (n=18)	74% (n=20)	0.09 (p=0.77)
Place and time	74% (n=20)	74% (n=20)	0 (p=1)

Phase 2

An initial comparison of the FES and SAS values revealed some clear differences in the assessor/researcher-assigned scores and participants' own perceptions of their performance with the STOP tool. Differences between external assessment and students' own self-assessments in education have long been an engaging area of research, with student self-assessment being considered a valid teaching tool particularly in the context of learning language/s (Blanche, 1988). While the participants were least able to effectively apply the tool in RIA mode, they nevertheless rated their ability to do so positively, with a mean SAS for RIA of 3.81 (SD=0.74). This rating was even higher than the SAS of 3.74 (SD=0.90) for ROA. Of all the FES and SAS values, participants' rated their own *understanding* of the tool the highest, with a mean value of 3.96 (SD=0.52).

With a kurtosis of -0.54 (SE=0.87) and 0.66 (SE=0.87), and skewness of 0.38 (SE=0.45) and 0.52 (SE=0.45) for FES-Mean and SAS-Mean, respectively, the scaled data were deemed approximately normally distributed, satisfying the assumptions for further parametric statistical testing. A paired samples T test was therefore run to investigate any statistical significance of the noted discrepancies between overall assessor/researcher's and students' own perceptions of their effectiveness using the tool. The results showed that participants clearly overestimated their ability to apply the tool in practice when compared to external assessor/researcher measurement, since the difference (M=-0.98, SD=1.20) between SAS-Mean (M=3.78, SD=0.66) and FES-Mean (M=2.80, SD=1.10), was statistically significant (p<0.001), with a strong effect size of 1.11 standards deviations.

The tendency for participants to overestimate their ability to apply the tool was also evidenced by the significant difference (p<0.01) of -1.17 (SD=1.18) between the overall assigned FES-Mean, and participants' self-assessed rating of their *understanding* of the tool (SAS-Und) of 3.96 (SD=0.52), with an even stronger effect size or 1.43 standard deviations. The distribution of the SAS-Und data showed a kurtosis of 1.29 (SE=0.87), and skewness of -0.07 (SE=0.45), satisfying basic assumptions of approximately normal distribution. Such noted discrepancies support Blue's (1994) earlier assertions that consistencies between student self-assessment and external assessment by educators, at least in the context of language learning, are less applicable at higher education levels. If, as Harris (1997) suggested, self-assessment represents a form of enhanced

personal reflection by students, then yet added importance is afforded to the general enterprise of teaching and learning reflective practice at higher education levels, if the discrepancy between self and external assessment is to be addressed and narrowed.

Phase 3

Themes emerging from the focus group discussion in Phase 3 converged around four main areas, namely, suggestions for teaching reflection tools more effectively, the essential nature of thinking and its relationship with acting/doing on a more abstract/theoretical level, learning to think as a novel prospect, and prospective purposes and benefits of using reflection tools.

In terms of delivery, it was agreed that reflection tools should be taught earlier, even as early as primary school. According to the participants, the older one gets, the harder it becomes to change the way one thinks. Also, Participant 2 felt that knowing about reflection tools through one's teenage years would help in negotiating some of the challenges characteristic of this particular stage of development. Some of the methods the participants specifically suggested for more effective teaching and learning of reflection tools included "role-play" exercises for added practice, with Participant 3 comparing the ideal environment for learning reflection tools to a "drama lesson".

Their emphasis on practice and realistic scenarios corroborated observations arising from my own reflections on my delivery of the STOP tool in class. The phase of the lecture dedicated to describing practical examples from my own experiences, in story form, in which the tool could have been used, and how, was by far the part in which students had appeared the most engaged. The participants added, somewhat quelling my concerns on the matter, that discussing the themes in a deeper and more philosophical way had indeed been helpful, although it would have been more effective in a discussion-based format, in smaller groups.

The participants described their tendency to act without thinking in situations characterised by the need for timely action, like in a job interview, where according to Participant 1, "You have to respond, you don't have time to think". In this respect, the proposed solution of learning to use reflection tools earlier in one's education, would help in making their application easier and more natural in such situations.

> "At first I thought it was a little bit strange, and how to do it, but once you get the first one done, it will come more naturally, more automatically." (Participant 3)

Strangeness and novelty also emerged through insights such as these. Use of a reflection tool, in either modality, was unanimously not something the students had considered before, yet they insisted that, once they understood it, and practised using it, the STOP tool made a lot more sense.

> "At first I found it silly because if I'm in a situation, am I really going to think about this tool and break it down in that moment? But then when you were saying how to use it, and I did my assignment, I noticed how it helped me more to reflect and make the situation better." (Participant 1)

In this regard, the participants commented positively overall on the relevance of using reflection tools (at least in ROA mode), supporting earlier conclusions by Solheim et al (2017), that

professionals generally tend to rate tools as useful once they have tried them. The participants considered enhanced decision-making ability as a primary benefit, as well as, in the words of Participant 2, the ability to gain, "another way of seeing things". Indeed, the notion of beneficial outcomes resulting from the use of reflection tools represents an important theme for grounding the findings of this study in the broader context of the academic literature on reflective practice.

Conclusion

Limitations

As with any study based on rubrics or other forms of performance ratings, the initial judgments to which relatively objective analyses are later applied, remain nonetheless fundamentally and inherently subjective in nature. Additional researchers enlisted to carry out these initial judgments, combined with inter-rater reliability checks may help enhance objectivity in future studies of this kind. Also, the existence of tacit thinking processes represents a problematic and immeasurable factor in all research on applied thinking and reflecting. Participants cannot communicate thoughts they themselves are not aware of, so in the case of RIA specifically, much can be assumed to have taken place beyond the direct knowledge of participants, and therefore cannot be reported or factored into this, or any study on the topic.

Findings

Considering the original five descriptors presented to the participants ranged from "not at all well" to "very well", the final *researcher-assigned* score of 2.80 (SD=1.10) showed that ultimately students were able to achieve only a moderate degree of success in applying it according to its intended design. The difference in expected standards of application between students and lecturers/assessors/researchers, suggest that more effective teaching and learning is needed for learners to fully appreciate the potential of reflection tools to enhance and support learning from experience.

The results clearly highlighted students' struggles with RIA, specifically. Despite Schön's seminal theoretical separation of Dewey's reflective thinking into its ROA and RIA forms, reflection tools addressing the latter appear to remain substantially problematic in both theory and practice. If learning informally in the workplace context accounts for between 62% and 70% of what employees "need to know" (Marsick, Watkins, Wilson Callahan and Volpe, 2006, p. 798), and according to Eraut, constitutes the "majority" of learning by professionals, technicians and managers (2004, p. 248), then further study of this relatively poorly understood modality represents a particularly propitious avenue for educators, trainers, and professionals themselves, eager to harness the learning that takes place in the midst of action during abundant everyday workplace situations and episodes. Reflection tools operable in RIA mode show potential in supporting practicum, apprenticeship, placement or otherwise work-based and experiential course components across a broad and diverse range of higher education areas and programmes.

Implications and future of the STOP tool

Following a comprehensive review of the literature on teaching and learning reflective practice in higher education settings, Coulson and Harvey (2013) presented a detailed plan for effectively scaffolding teaching and learning of reflective practice across four distinct learning phases, the third of which is aimed specifically at developing learners' propensity for RIA. In this sense, the STOP tool is presented as a viable working resource for teachers and learners in this particular stage of longer-term reflective practice interventions, across multiple prospective subject areas in

higher education. Provided the theoretical underpinnings of the tool presented in this paper are sound, and in view of its generally positive reception by the participants, the findings appear to warrant further research and development of the STOP tool itself as a teaching and learning aid. By applying some of the key emerging points in this study, specifically, allocating additional time to delivery, incorporating more practical delivery methods like role-play and scenario-based exercises, ensuring expectations about standards of application-efficacy are clearly stated, and focussing more intently on appropriate situation-recognition in RIA mode and the ability to "zoom-out", future research into suitably adjusted teaching and learning of the STOP tool may help foster increased efficacy and applicability, as well as provide additional means of more effectively teaching RIA in the context of longer-term scaffolded interventions.

References

Anbarasi, K., Vijayaraghavan, P. V., Latha, R., Kandaswami, D. and Kannan, L. (2019) Structured reflection with self-assessment rubrics: A study report on dental students' expression, experiences and perceptions about reflective practice. *Journal of Clinical and Diagnostic Research*, vol. 13, no. 4, pp. 10-16.

Andreas, C. and Andreas, T. (2009) Aligning perceptual positions: A new distinction in NLP. *Journal of Consciousness Studies*, vol. 16 no. 10-12, pp. 217-230.

Ayduk, O. and Kross, E. (2010) From a distance: Implications of spontaneous self-distancing for adaptive self-reflection. *Journal of Personality and Social Psychology*, vol. 98, no. 5, pp. 809-829.

Blanche, P. (1988) Self-assessment of foreign language skills: Implications for teachers and researchers. *RELC Journal*, vol. 19, no. 1, pp. 75-93.

Bloom, B. S. (1956) *Taxonomy of Educational Objectives, Handbook: The Cognitive Domain*. New York: David McKay.

Blue, G. M. (1994) Self-assessment of foreign language skills: Does it work? *CLE Working Papers, no. 3, ED396569, FL023929*. University of Southampton, UK, pp. 18-35.

Borton, T. (1970) *Reach, Touch and Teach*. London: Hutchinson.

Boud, D., Keogh, R. and Walker, D. (1985) *Reflection: Turning experience into learning*. London, UK: Kogan Page.

Boutete, I., Vandette, M. P. and Valiquette-Tessier, S. C. (2017) Evaluating the implementation and effectiveness of reflective writing. *The Canadian Journal for the Scholarship of Teaching and Learning*, vol. 8, no. 1, pp. 1-16.

Bruno, A. and Dell'Aversana, G. (2017) Reflective practice for psychology students: The use of reflective journal feedback in higher education. *Psychology Learning & Teaching*, voo. 16, no. 2, pp. 248-260.

Carruthers, P. (2017) The illusion of conscious thought. *Journal of Consciousness Studies*, vol. 4, no. 9-10, pp. 228-252.

Coulson, D. and Harvey, M. (2013) Scaffolding student reflection for experience-based learning: A framework. *Teaching in Higher Education*, vol. 18, no. 4, pp. 401-413.

Creswell, J. W. (2014) *Research design: Qualitative, quantitative, and mixed methods approaches, 4th edition*. London: Sage.

De Bono, E. (1990) *Lateral thinking: creativity step by step*. New York: Harper Perennial.

Dewey, J. (1910) *How We Think*. Boston: DC Heath & Co.

Eraut, M. (2004) Informal learning in the workplace. *Studies in Continuing Education*, vol. 26, no. 2, pp. 247-273.

Fox, K. R., Campbell, M. and Hargrove, T. (2011) Examining reflective practice: Insights from pre-service teachers, in-service teachers and faculty. *Journal of Research in Education*, vol. 21, no. 2, pp. 37-54.

Gibbs, G. (1988) *Learning by doing: A guide to teaching and learning methods*. Oxford: Oxford Further Education Unit.

Grossmann, I., Sahdra, B. K. and Ciarrochi, J. (2016) A heart and a mind: Self-distancing facilitates the association between heart rate variability, and wise reasoning. *Frontiers in Behavioral Neuroscience*, vol. 10, no. 1, p. 68.

Harris, M. (1999) Self-assessment of language learning in formal settings. *English Language Teaching Journal*, vol. 51, no. 1, pp. 12-20.

Holtom, B. C. and Kenworthy-U'Ren, A. L. (2006) Electronic negotiation: A teaching tool for encouraging student self-reflection. Negotiation Journal, July 303-324.

Marsick, V. J, Watkins, K. E., Wilson Callahan, M. and Volpe, M. (2006) Reviewing theory and research on informal and incidental learning [Evaluative report - ERIC Number: ED492754]. Available from: https://eric.ed.gov/?id=ED492754

Mocko, M., Lesser, L. M., Wagler, A. E. and Francis, W. S. (2017) Assessing effectiveness of mnemonics for tertiary students in a hybrid introductory statistics course. *Journal of Statistics Education*, vol. 25, no. 1, pp. 2-11.

Muscat, M. (2019) *The essential nature of on-the-job thinking: A phenomenological study of health and fitness professionals engaged in learning experiences*. PhD. University of Lincoln.

Passmore, J. (2017) 'Mindfulness in Coaching': STOP. *The Coaching Psychologist*, vol. 13, no. 2, pp. 86-87.

Savardelavar, M. and Kuan, G. (2017) The use of neuro-linguistic programming as an education-therapeutic programme: Two case studies. *Education in Medicine Journal*, vol. 9, no. 1, pp. 49-58.

Seibert, K. W. (1999) Reflection-in-action: Tools for cultivating on-the-job learning conditions. *Organizational Dynamics*, vol. 27, no. 3, pp. 54-65.

Shihu, X. and Fang, S. (2011) Optimization for information visualization based on visual thinking. 2011 International Conference on Electronic & Mechanical Engineering and Information Technology.

Schön, D. (1983) *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Smith, J. A. and Osborn, M. (2008) Interpretive phenomenological analysis. In: Smith, J. A. (ed.) *Qualitative psychology: A practical guide to research methods*. London: Sage Publications, 53-80.

Solheim, E., Plathe, H. S. and Eide, H. (2017) Nursing students' evaluation of a new feedback and reflection tool for use in high-fidelity simulation - Formative assessment of clinical skills: A descriptive quantitative research design. *Nurse Education in Practice*, vol. 27, no. 1, pp. 114-120.

Vygotsky, L. S. (1987) Thinking and speech. In: Rieber, R.W. and Carton, A.S. (eds.), *The collected works of L.S. Vygotsky, Volume 1: Problems of general psychology*. New York: Plenum Press, pp. 39-285.

Wallace, E. D. and Jefferson, R. N. (2013) Developing critical thinking skills for information seeking success. *New Review of Academic Librarianship*, vol. 19, no. 3, pp. 246-255.

White, R. E., Duckworth, A. L. and Kross, E. (2015) Spontaneous self-distancing and adaptive self-reflection across adolescence. *Child Development*, vol. 86, no. 4, pp. 1272-1281.

Wium, A. M. and du Plessis, S. (2016) The usefulness of a tool to assess reflection in a service-learning experience. *African Journal of Health Professions Education*, vol. 8, no. 2, pp. 178-183.

Yeganeh, B. and Kolb, D. (2009) Mindfulness and experiential learning. *OD Practitioner*, vol. 41, no. 3, pp. 8-14.

Zahid, M. and Khanam, A. (2019) Effect of reflective teaching practices on the performance of prospective teachers. *The Turkish Online Journal of Educational Technology*, vol. 18, no. 1, pp. 32-43.

Appendix 1 - Table 3: Complete data set extrapolated from the reflective essays.

ParticipantID	ROA									RIA											
	Situation	Zoomed-out	Self-critical	Self	Trust	Observation	Place & time	SAS-ROA	FES-ROA	Situation	Zoomed-out	Self-critical	Self	Trust	Observation	Place & time	SAS-RIA	FES-RIA	SAS -Overall	SAS-Und	FES-Overall
1	Yes	No	No	No	Yes	No	No	4	2	No	No	No	No	Yes	No	No	3	1	3.5	4	1.5
2	Yes	No	Yes	No	Yes	Yes	Yes	2	3	No	No	No	Yes	Yes	No	Yes	4	1	3	4	2
3	Yes	No	Yes	Yes	Yes	No	Yes	3	3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3	5	3	4	4
4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4	5	3	4	5
5	Yes	No	Yes	No	Yes	No	No	4	2	No	No	No	No	Yes	No	No	3	1	3.5	4	1.5
6	Yes	No	No	No	Yes	No	Yes	3	2	No	No	No	No	Yes	No	No	3	1	3	4	1.5
7	Yes	No	No	No	Yes	No	No	3	2	No	No	No	Yes	No	Yes	No	4	1	3.5	3	1.5
8	Yes	Yes	Yes	Yes	No	Yes	Yes	5	3	Yes	No	No	Yes	Yes	Yes	Yes	4	3	4.5	4	3
9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5	5	Yes	No	Yes	Yes	Yes	Yes	Yes	4	3	4.5	4	4
10	Yes	Yes	No	Yes	No	Yes	No	4	2	Yes	No	No	Yes	Yes	Yes	Yes	4	3	4	4	2.5
11	Yes	Yes	Yes	Yes	No	Yes	Yes	4	4	Yes	No	No	Yes	Yes	Yes	Yes	3	3	3.5	4	3.5
12	Yes	Yes	No	No	No	Yes	No	5	2	Yes	Yes	No	Yes	Yes	Yes	Yes	4	4	4.5	3	3
13	Yes	Yes	No	Yes	Yes	Yes	Yes	4	4	Yes	No	No	Yes	Yes	Yes	Yes	4	3	4	4	3.5
14	Yes	Yes	Yes	Yes	No	No	Yes	4	4	No	No	No	No	Yes	Yes	No	4	1	4	4	2.5
15	Yes	Yes	No	Yes	Yes	Yes	Yes	4	4	Yes	No	No	Yes	Yes	Yes	Yes	4	3	4	4	3.5
16	Yes	No	No	Yes	Yes	Yes	Yes	4	3	Yes	No	Yes	Yes	Yes	Yes	Yes	4	3	4	4	3
17	Yes	No	No	No	Yes	Yes	Yes	5	3	Yes	No	No	Yes	Yes	Yes	Yes	5	3	5	4	3
18	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5	5	No	Yes	Yes	Yes	Yes	Yes	Yes	4	1	4.5	4	3
19	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4	5	No	No	Yes	Yes	Yes	Yes	Yes	3	1	3.5	4	3
20	Yes	No	No	No	Yes	No	Yes	4	2	Yes	Yes	No	Yes	No	Yes	Yes	3	4	3.5	3	3
21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4	5	4	4	5
22	No	No	No	Yes	Yes	No	Yes	4	1	Yes	No	No	Yes	Yes	No	Yes	5	3	4.5	5	2
23	Yes	No	No	Yes	Yes	Yes	Yes	4	3	No	No	No	Yes	Yes	Yes	Yes	5	1	4.5	4	2
24	Yes	No	Yes	Yes	Yes	Yes	Yes	3	3	No	No	Yes	Yes	Yes	Yes	Yes	4	1	3.5	4	2
25	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3	5	Yes	Yes	No	Yes	Yes	Yes	Yes	4	4	3.5	5	4.5
26	No	No	No	No	No	No	No	3	1	No	Yes	No	No	No	Yes	No	5	1	4	5	1
27	Yes	No	No	No	Yes	Yes	No	2	2	No	No	No	Yes	Yes	No	No	2	1	2	3	1.5
Count	25	13	13	17	21	18	20	/	/	15	8	8	22	24	21	20	/	/	/	/	/
Mean	/	/	/	/	/	/	/	3.74	3.15	/	/	/	/	/	/	/	3.81	2.44	3.78	3.96	2.8