BRIEF

Implementing AcaWriter as a Novel Strategy to Support Pharmacy Students' Reflective Practice in Scientific Research

Cherie Lucas, PhD,[a] Simon Buckingham Shum, PhD,[b] Ming Liu, PhD, [b,c] Mary Bebawy, PhD[a]

[a] University of Technology Sydney, Graduate School of Health, Sydney, Australia
[b] University of Technology Sydney, Connected Intelligence Centre, Ultimo, Australia
[c] Southwest University, Faculty of Education, Chongqing, China

Corresponding Author: Cherie Lucas, University of Technology Sydney, Graduate School of Health, 100 Broadway, Chippendale, Building 20, Sydney NSW 2008, Australia. Tel: +61-2-9514-4275. Email: cherie.lucas@uts.edu.au

Objective. To explore pharmacy students' perceptions of the implementation of a novel web application tool (AcaWriter) into pharmacy curriculum to support reflective thinking in scientific research.
Methods. Qualitative research design involving a 50-minute focus group (n=12), audio-taped, transcribed verbatim and thematically analyzed using the Braun and Clarke framework.
Results. Thematic analysis generated 4 themes related to AcaWriter's utility, applicable for enhancing students' research thinking and capacity. Themes included: (i) ease of use to prompt reflection, tangible tool with non-judgmental capacity; (ii) benefits for enhancing self and peer reflection on research techniques and group dynamics; (iii) benefits of the reflective writing process to enhance research capacity compared with engaging in reflective dialogue; and (iv) benefits beyond the writing process: cultivating self-improvement and self-confidence.
Conclusion. The findings of this study show that a novel web application implemented within a pharmacy curriculum can assist students' self and peer reflection on a research task. Further research is required to explore the impact of utilizing this open source tool and its relationship with research academic performance and outcomes.
Keywords: reflection, formative feedback, pharmacy education, pharmaceutical research

INTRODUCTION

Developing research skills in the pharmaceutical sciences is not an intuitive process, however, reflection has been used as a pedagogical strategy to assist students with critical thinking processes, such as those required for conducting research. [1] Research processes are developed and refined over time with the understanding of the topic area, formulating the research question, developing and mastering technical competencies and interpreting and analyzing data. This complex process may take time, guidance, training and self-reflection. Reflecting on approaches, assumptions, and processes is often the first step to the deeper learning process.[2,3] However, reflection is not necessarily an inherent skill. [4] Previous research has shown that reflection can be taught through prompts, guides and instruction and can be facilitated by using a variety of different reflection tools, including those that involve reflective writing processes.[2] The choice of tool utilized is often dependent on its feasibility, utility and ease of use, with importance placed on the self-directed learning experience.

With recent advances in cloud computing power and Natural Language Processing (NLP), we are seeing an explosion of automated text analysis in many sectors. Through the software tools we use in our daily lives, we are becoming accustomed to the idea that computers can 'understand' (in a very different way compared to humans), for instance, the topics in a document (hence the power of online search), and linguistic expressions (eg, highlighting in an email when it appears someone wants to schedule a meeting; or automated language translation). NLP is establishing itself in specific educational contexts, one of which is instant, detailed, formative feedback on students' writing. Clearly, no human teaching team can provide such a service for potentially hundreds of students in a large cohort, on endless drafts, at any hour. This makes NLP, as a particular form of Artificial Intelligence (AI), in principle an attractive addition to the educational ecosystem — if it is well designed.

AcaWriter is a web application developed at the University of Technology Sydney (UTS), Connected Intelligence Centre, Sydney, Australia which is utilized to assist a learner with the reflective writing genre (AcaWriter orientation website, University of Technology Sydney: https://uts.edu.au/acawriter).[5] AcaWriter utilizes NLP techniques to detect elements of human reflective language text at the sentence level.[6] AcaWriter is grounded in pedagogical reflective writing theory, which defines several common reflective elements, such as the writer's experience of *context*, *challenge* and

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change. [6] These reflective elements are extracted by using concept mapping rules which identify the constituent concepts in a sentence, and the syntactic dependency between them. The development and evaluation of these concept mapping rules for detecting reflective elements have been described in a previous Australian study. [7] While rule-based approaches to detecting reflective writing can be designed and validated without large datasets, they also have limitations, and more recent work has evaluated machine learning approaches. [8]

Thus, instead of merely showing students examples of other people's reflective writing, in order to illustrate good and poor writing, AcaWriter provides students with immediate formative feedback on their *own* reflective writing. The feedback comes in the form of a written report which annotates the student's writing with a range of visual feedback (icons, bold, font colour, underlining), as well as offering written feedback (Appendix 1). The icons identify specific reflective elements in the text and are embedded and indicated within the text prior to the sentence. For example a blue square indicates *context* (initial thoughts, feelings and reactions about a significant experience); a pink circle indicates *challenges* (new surprising or unfamiliar ideas, problems or learning experiences); a green triangle indicates *change* (a shift in perspective relating to new knowledge gained that leads to a change). Feedback from AcaWriter also comes in the form of written feedback on the whole text and will prompt the learner to areas that seem to not be addressed. For example: it may state *"It appears that you have not yet commented on what you would do differently should the same even occur in the future"* or *"Perhaps think about changes in perspectives, strategies, behavior or approach."* (Appendix 1 provides a visual of an exemplar reflection and related symbols and prompts).

Note that since reflective writing is complex, safeguards are built in to cover for errors. AcaWriter is not used for grading, only to provide 24/7 formative feedback on drafts. The feedback is phrased in cautious language, and an alert at the top encourages the student to disagree, eg, if they feel that their writing does in fact convey an important move that AcaWriter has missed: *"Computers don't read writing like humans. So, if you're sure your writing's good, it's fine to disagree with AcaWriter's feedback, just like you'd ignore a poor grammar suggestion."* We want students to develop a critical attitude to artificial intelligence.

A precursor tool to AcaWriter was shown to be successful in assisting pharmacy students to reflect on their placement experiences in order to enhance future professional practice.[9] AcaWriter has also been utilized across a number of diverse disciplines: for example Law, Business, Engineering for the purpose of assisting students to develop reflective capacity.[10] However, AcaWriter has never previously been utilized to explore its value to assist students' *research thinking capabilities* in any educational discipline (although a strand of work has developed support for writing archetypally structured research abstracts in any field).[11]

A key insight from the prior work with AcaWriter, in both Pharmacy and other fields, is that it is most effective when coherently integrated into the curriculum and formal student activities, rather than being merely offered as an optional tool (analogous to a grammar checker).[9,10] The focus of this study was therefore to explore pharmacy students' perceptions of AcaWriter as they encountered it as part of the formal curriculum, to enhance their reflective thinking processes related to pharmaceutical research project outcomes.

METHODS

Context: *Drug Disposition for Pharmacy* (subject code: 96007) is a compulsory 6-credit Unit of study (UoS) offered to first-year Master of Pharmacy Students at the University of Technology Sydney (UTS), Australia, during their final semester. This subject covers the principle topics in pharmacokinetics, pharmacogenetics and pharmacodynamics required for applied therapeutics and practice. Core topics include: monoexponential kinetics, multiexponential kinetics, intravenous infusions, drug disposition, drug metabolism, drug elimination, and pharmacodynamics. The subject also covers advanced topics such as factors affecting drug efficiency including drug interactions and sources of variability (including the role of pharmacogenetics) in therapeutic outcomes. Applied topics include therapeutic drug monitoring, drug individualization and adverse drug reactions.

For the purpose of their research project, students are expected to design and conduct a practice relevant research project, write a draft scientific manuscript and present an oral presentation on their findings as a group task. (Groups were assigned by the course coordinator, each group n= 7, with one group of 8). Steps related to this project are summarized in Table 1. The project is a semester long activity (over 14 weeks) which involves a tiered approach to execution (Table 1). Students were requested to work within their groups and by mid-semester (Week 5 of semester), they were to submit a draft proposal of their research for a small percentage (10% weighting for summative assessment) to the course coordinator (Steps 5 and 6, Table 1). Students then had the opportunity to attend an interactive workshop, facilitated by two academics/faculty staff, one with an expertise in the pharmaceutical sciences (MB) and the other with an expertise in reflective practice (CL) to discuss summative results, related research project issues and to gain insights and understandings on how to improve for their final summative assessment for this research project. During this interactive workshop/laboratory (Step 7, Table 1), students were requested to use AcaWriter, first as a self-directed learning activity

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and followed with a peer reflection activity (sharing their thoughts and AcaWriter parser output(s) with their research group; and then with the entire cohort). The process undertaken for the self and peer reflection using AcaWriter in a workshop/laboratory has been documented elsewhere. [12] Prompt questions are included in AcaWriter, and address the research project, guided students' self-directed reflective learning activity and their thinking processes related to their research project. These included questions related to: methodology, calculations; teamwork and group dynamics for the group research project; their perception of their project management skills; and their application of scientific knowledge and linking pharmaceutical research to clinical practice (Step 7, Table 1; Appendix 1 shows the parser output of a students' reflection related to pharmacy practice.

A qualitative research design (thematic analysis of a focus group) was chosen given the nature of exploring student perceptions of using a novel online tool for reflecting on their research processes [13]
Before commencing this study, Human Ethics approval was sought and granted from the UTS Research Ethics Committee (Project number: ETH18- 3004). Since conducting the pharmaceutical research group activity was a compulsory component of the subject, all students were required to be involved and utilize AcaWriter as a tool to assist their reflective learning. However, participation in the Focus Group Discussion (FGD) conducted on completion of the project was a voluntary exercise. Recruitment for the focus group participants was via the Learning Management system by the lead researcher (CL) who was not teaching the students in the subject. The recruitment notice outlined that the first 12 students to indicate their interest to participate in the focus group would be accepted. The recruitment notice was not sent out to students until the following semester (after students had received their grades). Prior to the FGD, students who indicated their interest to participate were provided with a Participant Information Sheet and written Consent form (PISC). The PISC emphasized that if they were to contribute to the focus group session, it would not affect their grades for the UoS or other UoSs. Signed written consent forms were returned to the lead researcher (CL) indicating participant willingness to participate in the FGD. The FGD was facilitated by the lead researcher (CL) who guided discussion via the focus group guided questions (Table 2). The FGD was audio-taped and transcribed verbatim by an external transcription company. Since understanding students' perceptions was a desired outcome of this research, thematic analysis was considered the most appropriate method for data analysis,[14] undertaken according to Braun and Clarke's 6-phase process.[15] Themes were initially coded by the lead researcher (CL). A second researcher (MB) who also reviewed the raw data independently was consulted and final themes generated once consensus was reached.

RESULTS

From a total n=50 (m=17; f =33) Master of pharmacy students enrolled in the UoS, n = 12 students (24% of the cohort; female=11, male=1) participated in the voluntary 50-minute FGD. Thematic analysis generated four key themes: (i) Ease of use to prompt reflection, tangible tool with non-judgmental capacity; (ii) Benefits for enhancing self and peer reflection on research techniques and group dynamics; (iii) Benefits of the reflective writing process to enhance research capacity compared with engaging in reflective dialogue; and (iv) Benefits beyond the writing process: Cultivating self-improvement and self-confidence. Table 3 exemplifies these themes using verbatim quotes derived from 9 of the 12 students (m= 1; f= 8) who were involved in the FGD.

AcaWriter is far from perfect, and Appendix 1 provides some examples of when it performs well and poorly. As we discuss next, this is inherent to a form of writing as complex as personal, professional reflection, but did not prevent the tool from being positively received.

DISCUSSION

While AcaWriter has been utilized for self-directed reflective learning across a number of educational domains, [6,10] to our knowledge, this is the first study to explore student perceptions of this novel open-source web application to assist the development of practice-based research capacity. Furthermore, previous research related to the reflective genre in AcaWriter and its utility only explored its use with self-reflection and not with the capacity to be utilized to enhance peer reflection. [6,9,10] One of the findings of this study, supported in previous studies, is that engaging in reflection is a powerful tool that helps enhance relationships.[16] Students perceived the peer reflection component during the interactive AcaWriter workshop/laboratory as a process to support and build trust within a team environment.

There is growing recognition that analytics/AI-powered educational tools need to be developed using robust techniques that give different stakeholders (including educators and students) a genuine voice throughout the design process. [17] Without this, tools are not utilized to their full capacity, and are often ignored. We detail elsewhere the use of co-design techniques early in the design process, in which the lead educator (CL) was able to shape the tool's design. [18] We note that reflective writing is an extremely complex form of communication, with oneself and any others for whom this is intended. It is impossible for AI to 'understand' the meaning in the way that humans do, and even within the limitations of what AcaWriter seeks to do — provoke student reflection by mirroring back to them which sentences

appear to be making salient moves — it is imperfect. As shown in the screenshot in Appendix 1, a warning is given at the top of the feedback to remind students that the agency rests with them, not the computer: *"Computers don't read writing like humans. It's fine to disagree with AcaWriter's feedback, just like you'd ignore a poor grammar suggestion."* Elsewhere, we exemplify and discuss the impossibility of developing automated reflective writing classification and feedback that is exactly the same as how human teachers perform these tasks; rather, humans and machines are best understood as bringing complementary lenses. [7]

However, despite the imperfections of NLP, the results of our study confirm that students still perceived AcaWriter to be not only user-friendly, but valuable as an on-demand source of immediate formative feedback, that prompted productive reflection about their research projects. Research skills includes critical thinking processes, problem solving and effective communication and collaboration, especially if conducting research with a team approach. Previous research has shown that engaging pharmacy students in reflective practice can strengthen relationships and rapport with faculty, colleagues and peers, improve their clinical decisions, facilitate their critical thinking and problem solving ability and enhance their academic performance. [16,19–22] Despite some students indicating that they initially regarded the task of engaging in reflective writing as "futile," time consuming and a "box ticking exercise", which has also been also acknowledged in previous research, it appears that following the interactive workshop/laboratory, they changed their views and realized that engaging with the reflective process and using AcaWriter had its benefits, and that engaging with the self and peer reflection activities assisted them in their learning and critical thinking. [23] They perceived that the time allocated within the curriculum to reflect on various aspects of the project enabled them to move forward and re-evaluate their project methodology, calculations and team skills and resources, in order to produce a better research output. These results would seem to support the argument that in the context of building higher order student capabilities, imperfect analytics and AI still have important contributions to make in educational technology, when embedded into robust learning designs, and if students are encouraged to mindfully question, rather than mindlessly accept, the automated feedback. [24]

Reflective writing is a pedagogical strategy to prompt critical thinking. [25] The findings of our study indicated support for this process. While the debriefing session was perceived as useful through dialogue and facilitated discussion, it was perceived that the addition of the writing process further cemented their learning. Previous research supports this, and has shown that using a combination of a writing approach combined with verbal discussions complement the learning process and improve communication skills. Through this combined communication strategy, students acquire skills to reflect, which often leads to transforming their ideas into words. [26]

Another finding of our study indicated that students felt that the web application had further benefits beyond enhancing reflective and research capacity. Students perceived that the online platform enabled them to build their own confidence in the writing process (given the immediate formative feedback provided), facilitated a greater understanding of oneself through identifying their own assumptions, beliefs and approaches, and in some cases, some participants indicated that engaging reflective practice using this tool enhanced their mental health capacity. Based on the students' feedback, our current understanding is that this may be attributed to the fact that shy students, who would not normally engage in group discussions or hold back on their opinions for a group project, fearing self-doubt of being judged, find solace in the self-reflective writing component, while receiving instant feedback. The reflective writing can be refined several times until the student is happy with their final feedback (writing/feedback cycles that are only practical with automation), which may have improved their confidence level to then engage with the group. Thus, engaging with AcaWriter before a group discussion and peer reflection, enables a shy student to receive the feedback (automated, but grounded in theory) rather than through human interaction with a course coordinator or team member. The self-reflection activity (assisted with AcaWriter) prior to the peer reflection activity, enables a student to revise their thinking processes.

Limitations to this study include the fact that only one cohort of pharmacy students from one university were included in the sample and focus group discussions. The study may not be generalizable to all pharmacy students from other pharmacy schools, colleges and/or universities. A further limitation to the study included that only one focus group session was conducted. Data derived from two or more sessions may have resulted in the generation of different key themes. An additional limitation to the study relates to possible selection bias given the larger number of females who volunteered for the study compared to the male proportion. Furthermore, quotes indicated in the study were derived from nine of the twelve student participants. This was due to the fact that the quotes from the remaining three participants did not offer any additional information related to the themes generated from the discussion. Further research is warranted to include other pharmacy students from other schools, colleges and/or universities and other students from disciplines that include scientific research and teamwork as part of curriculum. Methodologically, an exciting opportunity for future work is to use system logs to build a picture of how students use the tool, to complement the insights gained from focus groups or surveys. For instance, we have demonstrated the computational analysis of the edits students make to their drafts to visualize the changes. [27]

Finally, the design of this study does not permit us to make the strong causal claim that the integrated use of AcaWriter leads to higher grades. Such claims pose methodological challenges to evaluating educational innovations in authentic settings. We can envisage a cross-over intervention-control group study, with repeated measures, to establish statistical relationships with final grades, but this would require substantial changes to the current curriculum. Alternately, a between-subjects design could compare an earlier cohort's grades (with no AcaWriter) with the cohort described in this study, but the samples would need to be comparable, and larger. Moreover, since the technology's availability fundamentally shapes the student reflection activities, the task comparison would not be exact. These are the complexities of evaluating educational technology interventions outside of artificially controlled laboratory studies. An example of an analytics-intensive approach is in related work (with another discipline and writing genre), evidencing that the quality of writing improved from draft to draft, in terms of the presence/absence of salient rhetorical moves, for students who engaged deeply with AcaWriter's feedback. [28]

CONCLUSION

The findings of this study show that when a novel web application was integrated into the pharmacy curriculum, it demonstrated potential to assist pharmacy students' self and peer reflection on a research task. Students reported that the reflection activities, augmented by AcaWriter's automated feedback, enabled them to better critique their own research skills and capacity, teamwork and collaboration approach, and refine their reflective and critical thinking processes to improve the research outputs. This study highlights the limitations of the current work, and the prospects for future investigations. Future and expanded investigations into the use of artificial intelligence based feedback would be beneficial to enhancing generalizability within pharmacy education.

ACKNOWLEDGMENTS

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Table 1. Tiered Approach to the Research Task

Step 1:	Students are introduced to the concepts of cell culture (assay) and laboratory induction
Step 2:	Students are to identify a practice relevant topic via discussion with their allocated group
Step3:	Students are to conduct assays and learn how to factor solvent concentrations
Step 4:	Students test their model
Step 5:	Draft proposal manuscript: A literature review. The draft manuscript is to be written up to the sections for methodology and calculations to date
Step 6:	Draft manuscript submitted to the Subject/Course/Faculty Staff Coordinator for grading purposes
Step 7:	Group feedback workshop: Includes AcaWriter utilization and peer reflection discussion.
	AcaWriter prompts the following questions:
	Do you feel confident in applying calculations and statistics; and if not what strategies will you utilize to address this?
	Reflect on your approach to teamwork and collaboration
	Reflect on your management skills
	Reflect on your clinical practice knowledge and how you applied it for the purpose of this project
	Reflect on your scientific knowledge and how you applied it for the purpose of this project
	Reflect on application of skills and attributes gained for your future practice as a pharmacist
Step: 8:	Refining the research proposal post reflection/AcaWriter workshop
Step 9:	Practice in the wet laboratory (setting up a standard curve)
Step 10:	Laboratory time allocated (5 hours maximum) to conduct the experiment, analyse data
Step 11:	Presentation of final manuscript for submission
Step 12:	Reflection on group (teamwork) and relevance to practice

Table 2. Focus Group Prompted Guided Questions

What have you learned conducting this research using reflective practice?
What have you learned about yourself during this process?
What skills and attributes have you acquired throughout this process?
What are your thoughts about the use of AcaWriter to enhance your reflective capacity?
Would you have done something differently as a result of the reflective process?
Did you feel a need to "reposition your approach" after participating in the AcaWriter reflection task?
How have your beliefs and assumptions changed as a result of this research task?
How has this influenced your attitude towards lifelong learning through research?
Where do you see application of this process in your everyday practice as a pharmacist?

Table 3. Emergent Themes, Theme Essence and Corresponding Student Participant (SP) Quotes

Themes	Theme Essence	Student Quotes
Theme 1 **Ease of use to prompt reflection, tangible tool with non-judgmental capacity**	AcaWriter was perceived to be easy to use with a tangible output:	*"It's easy to see where you're going wrong"* and *"seeing the tangible result"* *"It prompts you into developing those reflective ideas. ..you can only go so far on your own"* *"The prompts within the capacity of the tool "puts you on the right track"*
	The tool enables students to self critically reflect on their work and actions without the judgement from their peers or supervisors:	*"That's why it's so good because it is like getting someone else to edit your work…seeing the way someone else would think without having someone do it. And you don't feel judged by that"* *"You're not attacking yourself; you're not attacking anyone" when using the tool"*
	While not all participants initially thought the tool would be of any benefit. Some participants noting that they assumed that the tool and the reflective workshop would be futile	*"I'm not going to lie… (Using AcaWriter to enhance reflection) is the most ridiculous thing ever…rah rah rah"*
	However, even the sceptics realized that AcaWriter's capabilities prompted a reflective thinking process that would be useful to help with the research task	*"Even if it's not going to apply well to everything, you can see the benefits of the (reflective) process"* *"It makes you think of things that you normally would disregard on a daily basis"* *"makes you discover things not only about things that you're doing but things about yourself that you really never thought of"*
Theme 2 **Benefits for enhancing self and peer reflection on research techniques and group dynamics**	Reflection on the research project involved a number of areas. Students reported that the main topics on which they reflected most were: (i) team approach to the project; (ii) the need for effective communication with team members; (iii) impact of incorrect calculations and the reasons in which these came about; (iv) laboratory techniques; (v) knowledge of the expertise and skill sets of their research team members; (vi) self-awareness of their own strengths and weaknesses.	The general consensus was that the self and peer reflection process with aid of AcaWriter helped students to make better informed judgements on their research techniques and processes and prompted insights into their approach to the research by repositioning and readjusting communication with the team, thus allowing *"us to re-evaluate the group dynamic"* This was conducted by: *"speaking with each other honestly… play(ing) to each others' strengths (to allow) the group to shine"* This included awareness of accountability for individual's roles in the research project as well as for both personal and professional obligations. Critical thinking was noted to be at the forefront of the prompts provided through AcaWriter: *"if think more thoroughly about your actions and the way you work in comparison- not just to others- but also with others"* *"After the feedback, I learned that it's actually important that we look at each other's work as well"* Peer reflection was perceived to be a powerful tool in the learning process which was perceived to: *"build your communication and trust as a group…so without communication, there's no trust. Without the trust, you're not going to work well as a group"*

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| **Theme 3**

Benefits of the reflective writing process to enhance research capacity compared with engaging in reflective dialogue | It was perceived that the writing process was beneficial compared to purely just engaging with verbal reflective debriefing sessions | *"because it (the feedback) was in front of me, I could see what I was thinking"*

"I think it would help us deliver the right message. Like sometimes people misunderstand what we want to say. They misinterpret us. So I think if we write better, we will be able to communicate better… and say the right things at the right time." |
| **Theme 4**

Benefits beyond the writing process: Cultivating self-improvement and self-confidence | Students commented on the how AcaWriter feedback mechanism provided a platform to enhance their self-confidence | *"Because I realized that I had strengths in places that I actually didn't think I had"*

It was perceived to prompt a greater understanding of oneself, contributing
"towards (prompts) widening your perspective and learning"

Several students described the processes that lead to deeper reflection as contributing to *"better mental health"* citing AcaWriter as *"very therapeutic"* or *"completely therapeutic"* because it enabled the participant to:
"just type …all my subconscious thoughts… and not feel judged by what I'm typing"

"Building self-confidence because it seems to provide "clarity" of your thoughts and reasoning" and *"a better understanding of yourself"* |

Appendix 1. AcaWriter's user interface and sample feedback

These screenshots illustrate AcaWriter's differential feedback on weak and strong samples of students' reflective writing.

For details see the AcaWriter orientation website: University of Technology Sydney: https://uts.edu.au/acawriter

Reflective Report *tab annotating a sample of* **weak** *reflective writing*

The corresponding **Feedback** *tab*

Computers don't read writing like humans. So, if you're sure your writing's good, it's fine to disagree with AcaWriter's feedback, just like you'd ignore a poor grammar suggestion.

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Reflective Report	Feedback	Resources

- ✓ ■ Initial thoughts and feelings about a significant experience.
- ✓ ● The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
- ✓ **Deeper reflection, personally applied.**
- ✓ ▶ How new knowledge can lead to a change

- ✓ Expressions indicating belief, learning, or knowledge.
- ✓ *Expressions indicating self critique*

- ✓ ⚡ Sentence too long, might disengage the reader. Try breaking it into smaller sentences

This week while working my preceptor showed me what appeared to be a fake script. It was a really bad fake - a photocopy which was taped together to look like a valid prescription. One of the other pharmacists that was on duty had dispensed this script without double checking. ● When my preceptor showed me the script *I immediately could* tell that it was photocopied. My preceptor had called the doctor to confirm the script and that it was a valid script, but the reason that it was photocopied was unknown. Luckily in this case it was a valid script and the doctor sent a duplicate over. ● I think it is pretty bad that there are people out there who think *they can* rort the system this way.

Reflective Report	Feedback	Resources

- ❗ Perhaps consider introducing your first thoughts, feelings and/or reactions to an incident, or learning task, within the first paragraph. AcaWriter couldn't spot this within first paragraph

- ✅ You have reflected on your beliefs/learning/knowledge.
- ✅ You seem to have incorporated a deeper reflection indicating self-critique.
- ❗ You seem not to have reflected in a deeper way about your experiences. Consider applying your insights to how you can develop professionally.
- ✅ It appears that you've reported on something you found challenging.
- ❗ It appears that you haven't commented on what you would do differently should the same event occur in the future. Perhaps think about changes in perspectives/strategies/tools/ideas/behaviour and/or approach.

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Reflective Report tab annotating a sample of **strong** reflective writing   *The corresponding* **Feedback** *tab*

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Reflective Report	Feedback	Resources

✓ ■ Initial thoughts and feelings about a significant experience.

✓ ● The challenge of new surprising or unfamiliar ideas, problems or learning experiences.

✓ **Deeper reflection, personally applied.**

✓ ▶ How new knowledge can lead to a change

✓ <u>Expressions indicating belief, learning, or knowledge.</u>

✓ *Expressions indicating self critique*

☐ ⚡ Sentence too long, might disengage the reader. Try breaking it into smaller sentences

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■ **As blood pressure checks take little to no time at all** <u>I thought</u> **I'd utilise my multi-tasking abilities, and asked the patient to sit down on the chair for a couple of minutes while I dispense her scripts and find the blood pressure machine.** After dispensing the patient's scripts, noticing that she was on Coversyl 10mg daily, I walked over to the patient and checked her blood pressure. To my surprise the patient's blood pressure was low, at a reading of 98/74mmHg. To make <u>sure</u> that the machine recorded the right reading, I checked the patient's blood pressure again, and to be sure it was the same reading. ● After I had taken the patient's blood pressure, I explained to the patient that her blood pressure was low and <u>wondered</u> whether her dose of blood pressure medication was too high for her. ■● **As soon as I explained this to the patient, the patient rushed to her bag and pulled out a script for Coversyl 5mg, which she had just received from the doctor that very day.** I then cancelled the patient's script for Coversyl 10mg daily, and dispensed her new script. ■▶ **After having this experience with the patient,** *I must* <u>admit</u> **that I was quite proud of myself for rising to the occasion.** ● **If I had been overwhelmed by the amount of patients in the store,** *I might* **not have the time to check the patient's blood pressure and** <u>realise</u> **that she was on the incorrect dose of her medication.**

Reflective Report	Feedback	Resources

⊘ It appears that you've acknowledged your first thoughts, feelings and/or reactions to an incident, or learning task, within the first paragraph.

⊘ You have reflected on your beliefs/learning/knowledge.

⊘ You seem to have incorporated a deeper reflection indicating self-critique.

⊘ It appears that you have reflected in a deeper way about how your experiences connect with your professional development.

⊘ It appears that you've reported on something you found challenging.

⊘ It appears that you've reflected on how you would change/prepare for the future. Is there anything further to say about these new insights that have led to change.

⊘ It appears that you may have expanded the detail on the challenge you faced. (1)

❗ While it appears that you've reported on how you would change/prepare for the future, you don't seem to have reported first on what you found challenging. Perhaps you've reflected only on the positive aspects in your report?.

Full size colour versions are available online at: *University website link will be added during final proofing*