

Article

“Addiction Pharmacy” and the Professionalization Process: Technology-Enhanced Assessment of Reflective Practice and Teamwork

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Abstract: Professionalization of pharmacy students requires that they both recognize the dynamic social contract between the public and the profession and demonstrate themselves competent in professional attributes. This pilot aims to demonstrate and assess the attributes of reflective practice and teamwork in a manner that also demonstrates student recognition of the profession’s responsibilities towards addiction to medicines. The assessment of a series of 8 weekly workshops on addiction pharmacy was adapted to include an online reflection, or journal entry, after each workshop. Groups of up to five students also collaboratively prepared a letter, in the format of an online wiki or editable website, to a choice of the Minister for Health, a national newspaper or a popular television chat-show. Groups aimed to influence decision-makers in a manner supportive of society’s management of drug addiction. Online activity, grading and results of a student survey indicate that this novel assessment strategy provides a means by which aspects of the professionalization of pharmacy students might be effectively demonstrated and assessed. The article shares the assessment design, indicates how it may facilitate the demonstration and assessment of professional attributes, highlights the link with elements of the professionalization process and concludes that further investigations are merited.

Keywords: professionalization; technology-enhanced learning; online assessment; wikis; online journals; teamwork; reflective practice; professional attributes

1. Introduction

The professionalization of undergraduate pharmacy students is challenging for many reasons including that there “is currently no clear definition of professionalism as applied to pharmacy” [1] (p. 118) and the identification of “tangible measurable outcome[s] remains a challenge still to be effectively resolved” [2] (p. 155). The absence of consensus on a definition of professionalism and how it might be assessed is not confined to pharmacy. There is an underlying “tension between those who wish to teach professionalism as essentially a moral or social endeavor and those who wish to have a list of attributes” [3] (p.357), and a scarcity of validated assessment methodologies aligned with the professionalization process has been highlighted repeatedly [3–7]. Notwithstanding support for the “moral endeavor” approach to professionalization, such as the proposal by Bebeau and Monson that becoming a professional is not only an intellectual process, but also a social and moral process [8], and/or the sociological approach as supported by experiential learning and role models [1,9] current global developments in education in various healthcare programs suggest that there is particular merit in considering the attributes related to professionalism in the context of assessment challenges. This consideration is followed by a review of professionalization, the profession and the social contract before returning to the outcomes of an assessment process aligned with a series of eight weekly workshops in addiction pharmacy delivered, by external practitioners, to students in their final semester of a pharmacy (B.Sc.Pharm) degree program in the ROI.

The context of this study merits clarification. Undergraduate students in Ireland are not yet in the patient-facing practice environment, and do not undergo structured practice placements under the guidance of tutors trained in assessment as might be the situation in other jurisdictions. Graduates of the B.Sc.Pharm may apply to enter the National Pharmacy Internship Program (NPIP), a one year MPharm program delivered, by the Royal College of Surgeons in Ireland (RCSI) on behalf of Irish pharmacy’s regulator the Pharmaceutical Society of Ireland (PSI), following successful completion of which students may apply to enter the register of pharmacists. The B.Sc.Pharm includes a module on “Addiction Pharmacy”, the objective for which is “To provide students with an understanding of the nature, extent and causes of problem drug-taking in Ireland in order that they can *undertake professional activities as pharmacists* in the prevention and treatment of drug dependence and other drug-related problems” (Figure 1). The module, delivered during the final months of the 4 year undergraduate program, is composed of lectures (60% written exam), practicals (10%) and this series of 8 workshops the assessment of which accounts for 30% of the module marks. Prior to this pilot study, these eight workshops were assessed by completion of up to eight 500 word essays related to topics set by each workshop leader, grades for which accumulated towards the 30% allocation. In contrast the pilot described in this article required students to prepare a reflection following each weekly workshop and to engage in a team-based task aligned with the objectives of the series.

In order to support horizontal or between module alignment of “practice of pharmacy” contributions in the degree program, the author (as with other staff members) delivers material across a range of modules. The addiction pharmacy module is delivered in addition to social and administrative pharmacy and other practice of pharmacy modules as would be generally found in undergraduate pharmacy degree programs [10] and there is no suggestion that it should replace those aspects of the program.

Both the B.Sc.Pharm and the NPIP are accredited by the PSI, which, following a review of pharmacy education and accreditation published in 2010 [11] developed educational standards and accreditation processes that prioritize evidence of program outcomes and graduate competencies rather than program content and delivery processes. These new standards have prompted further development of teaching and assessment of “professionalism and ethics”, as is the key area of responsibility assigned to the author.

1.1. Graduate (Professional) Attributes and Their Assessment

Recent development of core competency frameworks (CCF) for pharmacists [12,13] outline specialist knowledge, skills, attributes and behaviors collectively considered to demonstrate professionalism in registered pharmacists. The CCF in the ROI addresses a broad range of behaviors within domains entitled Professional Practice, Personal Skills, Supply of Medicines, Safe and Rational Use of Medicines, Public Health and Organization and Management Skills [12] thereby targeting both the knowledge and skills underpinning the practice of pharmacy and sociological, or behavioral, approaches to professional practice. The accreditation guidelines for undergraduate degree programs, published by the PSI [10], map to these frameworks. CCFs provide educators with frameworks by which a competency based assessment (CBA) strategy appropriate to the “performance” level expected from graduates of a professional degree program might evolve [14]. In this context the educator’s priority is to characterize those expectations [3,9], incorporate an assignment by which the student can demonstrate that he/she has developed the relevant competencies and assure that an assessment capable of measuring the extent to which the student has demonstrated those competencies, according to defined outcomes, is aligned with the curriculum and its outcomes [15–17].

In line with other healthcare professions, guidelines issued by the regulatory body now include direct reference to professional, or “graduate”, attributes considered to be essential for the delivery of both current pharmacy services and for evolving roles, highlighted attributes must have been demonstrated prior to graduation. Reflective practice and teamwork are included amongst a list of 13 “generic and personal qualities expected of a pharmacy graduate” [10] (p. 4). Pharmacists must “demonstrate the ability to critically reflect on their own practice and skills to identify learning and development needs” [12] (p. 12), an expectation which aligns with Schon’s observation that professional knowledge is built on experience obtained in the practice environment and then by being reflective on that practice [18]. These students are not yet in “practice”. However, the methodology incorporates a weekly online reflection after each of eight two-hour workshops delivered by experienced practitioners. The integrated nature of the series of workshops facilitates bringing practice to students in a manner that supports an experiential learning, or construction of knowledge and meaning from real-life experience [19], component to the development and demonstration of competencies related to reflective practice. Pharmacists must also “collaborate ... to manage the care of a patient” for which they need to “recognize the value ... of a teams” [12] (p. 14) and related behaviors proposed in the CCF include effective communication skills, respect for others and the demonstration of influencing and negotiation skills to resolve conflicts and problems. The team task is to collaboratively prepare a communication related to the series of workshops.

A requirement that such attributes be demonstrated and assessed prior to graduation of pharmacy students is proposed “in the knowledge that such outcomes pose problems for assessment” [7] (p. 367) but the drive to address these “problems” derives from consensus that “while teamwork and professionalism are emphasized in many curricular documents, the assessment of the “soft” skills is problematic. ... there is a lack of validated summative assessment” [20] (p. 380). Where assessment of professional attributes does occur in undergraduate education of healthcare professionals, it “tends to be subjective rather than objective” [5] (p. 736) and difficult to validate as part of a competency based assessment process. Indeed the gap in assessment methodologies specific to teamwork competencies appears to be particularly acute with the recommendation that “assessors and test developers should actively devise assessment strategies to include broader competencies such as teamwork” [21] (p. 368). Proposals that “there should be a change in emphasis from assessing the individual to one which stresses both individual and the team” [5] (p. 714) and a strategy that recognizes “the power of assessment to drive learning, especially slowly learnt graduate attributes” [22] (p.490) are supported by Norcini *et al.* in their consensus on “criteria for good assessment” [23].

This study aims to pilot a means by which one aspect of this gap might be addressed. Behaviors proposed in the CCF guide the development of rubrics, which articulate grading expectations [24,25], aligned with competency demonstration. Notwithstanding the subjectivity associated with the grading of competencies related to professional attributes such as reflective practice and teamwork, the detailed rubrics have the potential to provide heretofore unavailable support to the assessment process. As they identify relevant evaluation criteria for assessment of the targeted attribute and describe the level of performance expected for each grade, rubrics also support self and peer assessment and a structured approach to feedback [6]. Additionally, as assignments are completed in the Blackboard Learn (BBL) virtual learning environment (VLE), student demonstration of reflective practice and teamwork competencies can be observed and reviewed, and the rubrics guide assessment in a transparent manner.

1.2. Professionalization, the Profession and the “Social Contract”

Professionalization of pharmacy students requires that they both recognize the implications of professing to be a member of a profession and demonstrate themselves competent in graduate, or professional, attributes. If individual pharmacists are to be considered professionals, they must both personally meet the standards expected of a member of the profession as outlined in the CCF and have a profession to which they can belong [1,12,26–31]. As it is society that grants the status of profession, and the norms of a society change over time, society has changing expectations of a group to which it grants professional status. Welie describes the relationship as a dynamic social contract between the public and the profession [31,32]. Society’s recognition of the potential benefit of medicines underpins its preparedness to take the risk that harm may be caused in pursuit of the desired benefits. However it’s acceptance that medicines can also cause harm underpins its justification for the restriction of access to available medicines by the general public, a restriction that could otherwise be considered an infringement of civil liberties. This restriction is managed by the granting of the custodian-of-medicines role, wherein legislation restricting access to certain “controlled” substances (medicines) identifies circumstances in which the pharmacist may hold and be a legitimate supplier of such substances, in the form of this social contract with the profession.

Professionalization, as interpreted in “The peril of deprofessionalization” [30], proposes that distinguishing attributes of a profession include (1) “A systematic body of knowledge or theory; (2) Authority recognized by clients; (3) Broad community sanction of this authority; (4) A regulative code of ethics and (5) A professional culture sustained by professional associations”. Educators can provide structured access to the “body of knowledge” and the theoretical basis of the regulative code of ethics but it is clear that knowledge alone, even when combined with the “cognitive ability to apply the knowledge in order to be able to demonstrate that they can perform the skill” [14] (p. 925), is not a basis on which to claim entitlement to call oneself a professional. Educators may also prompt students to consider challenges posed by commercial influences on pharmacists, thereby preparing students to appropriately manage potential conflicts of interest that might result from the position of power that the “custodian of medicines” role might create [33], but conscientious management of such potential conflicts of interests is an expectation of all those who operate businesses i.e., is not restricted to those claiming to call themselves “professionals”.

While the “Authority recognized by clients” may simplistically be seen to derive from the development of a trusting relationship between the healthcare practitioner and the patient, in reality the expectation by the patient that his/her best interests will be prioritized by a newly encountered member of the profession derives from a societal trust or broad community sanction of the collective profession’s authority, as summarized by the “notion ... that professionalism is a collective responsibility of the ... profession that arises from the social contract with society” [3] (p. 361).

The “Addiction pharmacy” module addresses the potential for available chemicals to do harm in the context of the vulnerable individual that might become addicted, or chemically imprisoned. It also introduces students to international strategies, such as the prioritization of enhanced training for those involved in responding to the “drugs phenomenon” in the recently adopted EU Drugs Strategy 2013–20 [34], in place to cope with challenges posed to individuals and communities by drug misuse. This reinforces, for students, that those vulnerable to the addictive process require protection and, where addiction takes hold, support as they struggle with the condition. The law can concurrently prosecute and sanction those who seek to take advantage of vulnerable citizens but that is outside the scope of this paper. Given pharmacists’ role as medicines experts and their role as society’s licensed suppliers and custodians of “Controlled Substances” [34], engagement with “addiction pharmacy” is at the heart of the profession’s social contract with society and, as the workshop series takes place during the final semester of the four year B.Sc.Pharm. degree program, the choice of tasks as related to the role of the pharmacist in managing patient and societal challenges related to addiction pharmacy is both relevant to the social contract and integrated with the program.

The series of reflections drives “real time” student engagement with the workshops and a recorded commentary from which students can harvest as they make contributions to the teamwork element. The involvement of experienced practitioners as workshop leaders reinforces for students that pharmacists take their professional “custodian” responsibilities seriously and accommodates the finding by Schafheutle regarding “the importance of role models on the professional socialization of pharmacy students” [1] (p. 126).

The teamwork assessment process requires groups of four or five students to prepare a letter seeking to influence policy makers (Minister for Health), the readers of a national newspaper or the audience of a popular television chat-show as to the increased role(s) pharmacist might play in the

prevention and management of drug misuse in society, and it therefore provides scope to directly align with the assertion that “Professionalism is something that serves a social purpose of some higher order... the emphasis is on macro level” [3] (p. 361). The “letter” is prepared by construction of a 600 word wiki, or editable websites that is created incrementally by participants working collaboratively, and thereby provides a format where students can add to, delete from or amend a shared document online and contributions of individual students to the construction of the final document can be reviewed and assessed.

Peer debate, and peer assessment of completed wikis, force deeper reflection on both the concepts inherent in the workshops and the target audience for the communication, and contributions to the debate (wiki construction) can be reviewed online and assessed against the rubrics. In this way the social-constructivist approach aligns effectively with the online environment [35,36] and with the process of developing professional attributes by placing “particular emphasis on the catalytic effect of the assessment” [23] (p. 206). In making explicit the profession’s responsibility to proactively address societal issues related to addiction pharmacy, students are also reminded that “Unlike charity, professional altruism is not an option but an obligation that binds each and every member, individually and collectively” [31].

This pilot aims to signpost how the attributes of reflective practice and teamwork might be demonstrated and assessed in a manner that also demonstrates student recognition of the profession’s responsibilities towards addiction to medicines. The article shares the assessment design, indicates how outcome measures may be supported by the reporting functionality in the virtual learning environment (VLE) and reports on student feedback following the process. Recognized limitations and suggestions for further research are included.

2. Method

As students were invited to voluntarily and anonymously complete a short survey following completion of the series of workshops, ethics approval was obtained prior to commencement.

Rubrics were developed to align with the attributes of reflective practice and teamwork. Criteria highlighted for reflective practice were (a) reflective depth [24,37]; (b) professional concepts and links with the role of the pharmacist in managing drug misuse (content and context) and (c) expression (attention to clear, concise and evidence based expression) (Appendix 1) and those for teamwork were (a) engage with peers and (b) negotiate towards an agreed document; (c) participate in the process in a respectful manner (netiquette, or online etiquette, and professionalism) and (d) present content that is evidence based and expression of a high standard (Appendix 2).

The assessment coordinator (author) discussed the proposed assessment design with each of the workshop leaders during its development, and maintained contact with them as the series progressed. Leaders ensured that student sign-in sheets, providing a record of student attendance at the workshop, were returned at the end of each workshop.

The 53 final year students on the program were registered for the series of workshops. Background resources, including the rubrics, timetable, grading format and explanatory notes were uploaded to the VLE and separate folders for each workshop were set to release automatically prior to the relevant

workshop. A direct link to the student's online journal was incorporated to each folder and a prompt question, designed to guide towards deeper reflection, was set to release at the time the workshop ended.

Rubrics were activated and linked with both online journals and wikis in the VLE and made visible to both students and assessor when in the activity itself. Access to a discussion forum, moderated by the assessment coordinator and made available throughout the series, was accessible by all students. Online and face-to-face instructions reinforced that students were required to upload a 150 word reflection within six days of each workshop and students could harvest from the collated series of reflections when engaging in the group exercise. Professionalization and social contract theory, as included in material delivered in the previous semester, were highlighted as relevant to this workshop series and its assessment. Face-to-face group feedback on the first journal entries was provided at the beginning of the second workshop, written formative feedback comments and grades against each of the criteria in the rubric were provided online within 10 days of the second workshop, and the series of reflections was reviewed and graded against the rubric following completion of the series. This final grade accounted for 15% of the overall module marks where 70% of the module marks continue to be allocated to a written exam (60%) primarily designed to assess material delivered in the other 12 lectures in the module and completion of workbooks related to two practicals (10%).

Wiki tool functionality, enabling asynchronous communications during the development of the agreed document by using the comment function, was demonstrated to students. In week four, the topic for the teamwork assignment was identified as "The role of the pharmacist: promoting better utilization of the pharmacist's competencies in addressing drug misuse". Three relevant audiences were identified as (1) policy makers (the Minister for Health); (2) print media (a major national newspaper, or broadsheet, known as the Irish Times, which has a readership of 321,000 [38] mostly adult ABC1 [39] readers) or (3) public opinion (a popular weekly Friday night television "chat-show" known as "The Late Late Show", which has an average of 971,000 viewers [40], approximately 21% of the total 4,581,260 [41] population of Ireland. It regularly has discussion panels on topical social issues). Three online groups, labelled as for these three separate audiences, were formatted to permit a maximum of 18 students to join during a defined 10 day period. Those who had not self-selected by the deadline were assigned to a remaining audience. Within each "audience" selection, students were randomly assigned to a "wikigroup" of four or five students giving a total of 12 groups. These 12 wikigroups were then established with independent wikis on the VLE.

The fifth workshop was delivered in one-hour thereby facilitating that the assessment coordinator could avail of the second hour in the workshop to guide students as they planned the teamwork assignment, face-to-face, with their online group. They were advised that a summary of any offline deliberations should be uploaded as a comment to the wiki. Students were encouraged to "harvest" from their individual journals when contributing. Wikigroups were required to complete the task within 15 days, after which a printed copy was to be signed by all members in the group as confirmation of (perceived) equitable contribution by each, and returned to the workshop assessment coordinator. The 600 word wikis, and the engagement of wikigroup members in their development as evidenced from the online commentary, were reviewed and graded against the rubric, following completion of the series. This final grade accounted for the remaining 15% of the overall module marks.

Prior to the final workshop each group was provided, online, with two wikis completed by other wikigroups, one each having addressed the two audiences that were not the target of its own wiki. The

final workshop included a peer review session, wherein each group provided written feedback, guided by the teamwork elements of the rubric (content and expression), for those other two groups. The coordinator then provided each group with the coordinator's own written feedback.

Figure 1. The assessment process as aligned with the delivery of the workshop series [42].

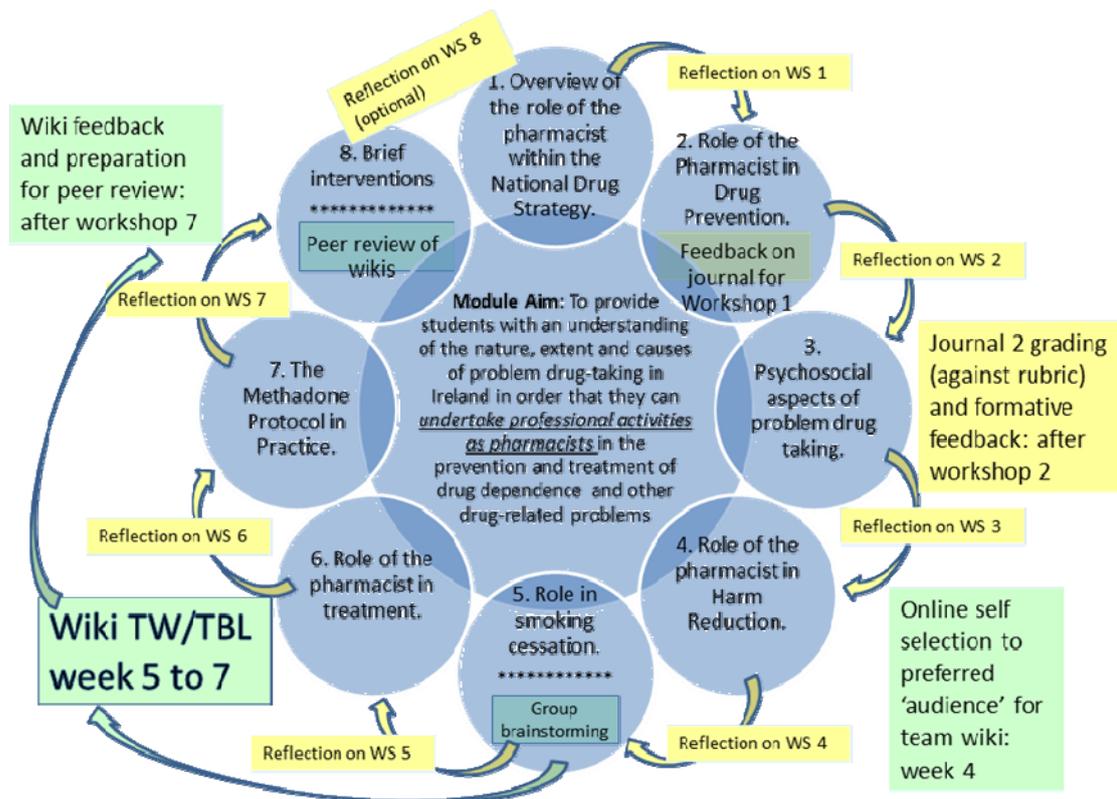


Figure 1 identifies the titles of the eight workshops (WS) in order of delivery, the module aim in the center, the points at which reflections are posted online and the elements associated with demonstration of teamwork (TW) using the online team-based learning (TBL) wiki assignment.

A student feedback survey was developed as found in Box 1. It was designed to obtain student rating of the assessment process as a means of: (1) assessing engagement, and demonstration of highlighted competencies and knowledge (Q.1); (2) module and program outcomes aligned with the professionalization process (Q.4) and (3) overall learning from the module (Q.5). Freetext questions, to encourage critique of the assessment methodology, were included at questions 2 and 3.

Directly following the final workshop students were invited, by means of an email which included a link to its location, to complete the student feedback survey. Access to the survey was restricted to 2 weeks.

The study design takes a primarily quantitative approach. It avails of facilities in the Blackboard Learn (BBL) VLE to provide numerical counts of “activity” within a module, a record of when identifiable contributions to journals and wikis are made and a means by which anonymized student answers to the survey could be managed so that student engagement, grades, and rating of questions 1, 4 and 5 (Box 1) can be collated, evaluated and compared. In addition content of the 12 wiki communications produced by the groups of students and the individual freetext answers to survey questions 2 and 3 were reviewed for themes and recommendations.

Box 1. Addiction Pharmacy: Workshop series Assessment Process Feedback Survey.

On a scale of 1 to 5, where 1 is “strongly disagree”, 2 is “somewhat disagree”, 3 is “neither agree nor disagree”, 4 is “somewhat agree” and 5 is “strongly agree” please rate the following statements:

1. This Assessment Process is an appropriate means of assessing whether students

- (a) review and engage with the material provided through the workshop series.
- can demonstrate competencies related to independent and critical review as they relate to the workshop series.
- (b) demonstrate reflective practice, incorporating written communication skills
- (c) demonstrate team-working competencies as they relate to the process of negotiating group consensus on the preparation of a professional document
- (d) demonstrate knowledge of content/material introduced through the workshop series Pharmacy .

2. What else would you like to feedback regarding your experience of the Addiction Pharmacy: Workshop series Assessment Process?

3. What aspect of the “Addiction Pharmacy: Workshop series Assessment Process would you discontinue or change? (Please state why.)

On a scale of 1 to 5, where 1 is “strongly disagree”, 2 is “somewhat disagree”, 3 is “neither agree nor disagree”, 4 is “somewhat agree” and 5 is “strongly agree” please rate the following statements:

4. The B.Sc.Pharm student should be able to, on completion of the workshop series assessment process:

- (a) commit to the ethos of professionalism, as it relates to Addiction Pharmacy.
- (b) commit to having a duty of care to and respect for the patient and a maturity to make professional decisions in the best interest of the patient, as they relate to Addiction Pharmacy.
- (c) discuss the National Drugs Strategy and the role of the pharmacist in addressing drug misuse, as they relate to Addiction Pharmacy.
- (d) discuss the complexity of a drug taking problem, as it relates to Addiction Pharmacy.
- (e) discuss the psychosocial aspects of drug abuse.
- (f) describe the role of the pharmacist in smoking cessation.

5. Please rate whether you think that, **overall**, this assessment process is an appropriate means to determine students’ learning within this module.

3. Results:*3.1. Student Activity on the VLE: Blackboard Evaluation Tool*

Online activity related to the workshop series resulted in an average of 228 “hits per student”, “hits” referring to the number of times that a student accessed an element of online resources or tools. By comparison, all other lectures (12 hours) and workshops (6 hours) in the module collectively generated 23 hits per student. Two students each missed one reflection deadline date, with all other reflections being posted on time, demonstrating a 99% engagement rate. Attendance at workshops, as verified by sign-in sheets, demonstrated a 98% attendance rate, with no student missing more than one workshop. There was an average of 50 hits/student during the wiki formation, with greatest activity in the groups addressing the Minister for Health (average = 300 hits per group) and least activity in those addressing the audience of the “Late Late Show” (average = 161 hits per group”).

3.2. Student Performance: Journal Entries and the wiki Process

Average marks awarded to the 53 students for each of the criteria specified on rubrics and average overall performance (percentage grades) are presented in Table 1.

Table 1. Average student grades for reflective practice and teamwork ($n = 53$ students).

Reflective practice (RP) (Percentage awarded for each criterion)				% Reflective Practice
Criteria	Depth	Concepts	Expression	
Mean	58%	60%	55%	58%
Std Dev	9%	10%	8%	8%
Min	45%	45%	45%	45%
Max	80%	80%	70%	80%
Teamwork (TW) (Percentage awarded for each criterion)				% TeamWork
Criteria	Content	Expression	Engage	Respectful
Mean	72%	70%	78%	78%
Std Dev	1%	9%	13%	11%
Min	55%	55%	20%	30%
Max	90%	90%	85%	85%

Students were awarded an average of 58% for reflective practice and 75% for teamwork. Criteria described as “Participation in the process in a respectful manner” and “Engages with peers; negotiates towards an agreed document” obtained average marks of 78%. Expression was awarded the lowest average percentage against both rubrics (mean 55% for reflective practice and 70% for teamwork).

3.3. Outcome of the Student Survey

Thirty-five of the eligible 53 students voluntarily completed the online feedback survey (Box 1), giving a completion rate of 66%. As participation in the survey was optional and responses were anonymized 66% was considered to be a high participation rate. Student responses to the questions formatted using a likert scale are summarized in Table 2.

It is notable that students are considerably less in agreement with a statement proposing that this assessment process is an appropriate means of assessing whether students demonstrate knowledge acquired during the workshop series, than statements proposing that graduate attributes have been demonstrated. While knowledge acquired is a basis on which reflection and teamwork activities are built, knowledge demonstration was not the primary objective of this assessment process and it would appear that students have recognized this aspect. Students’ self assessment of their ability to demonstrate program and module learning outcomes (Question 4) as they relate to addiction pharmacy following completion of the workshops series assessment process is very high, as 94% or more students agree or strongly agree with every statement. Student rating of the assessment process as an overall means to determine students’ learning within the module represents less satisfaction than with other survey statements with 9% of students in disagreement with the statement and is interpreted to be a reflection of their expectation that knowledge demonstration should be a core element of every

assessment process. Where students were encouraged to feedback on the experience of the assessment process (question 2) and invited to state, with explanation, what aspect they would discontinue or change (question 3), 26 of the 35 students gave comprehensive answers to these two questions, that is, more than just referring to it as “enjoyable” or other one-word answers.

While student responses to all questions are reported here, discussion of commentary from students will be confined to content related to the professionalization process, and to evidence of increased understanding of the social contract as it relates to the profession of pharmacy as demonstrated by professional concepts included in the final wikis. Commentary related to student evaluation of the criteria chosen for the rubrics and student experiences of the assessment process itself are the subject of another paper.

Table 2. Students’ rating of survey questions in Box 1.

Q1	Key competencies related to: whether the Assessment Process is an appropriate means of assessing (Question 1)	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
a	Review and engagement	26%	54%	11%	9%	0%
b	Independent and critical review	23%	57%	11%	9%	0%
c	Reflective practice	34%	46%	11%	9%	0%
d	Team-working competencies	37%	43%	9%	11%	0%
e	Knowledge	17%	40%	17%	26%	0%
Q4	Student’s ability to demonstrate program and module learning outcomes (Question 4) as they relate to addiction pharmacy.	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
a	Commit to the <u>ethos of professionalism</u>	43%	54%	3%	0%	0%
b	Commit to having a <u>duty of care</u> to and respect for the patient and a maturity to <u>make professional decisions in the best interest</u> of the patient.	54%	43%	3%	0%	0%
c	discuss the <u>National Drugs Strategy</u> and <u>the role of the pharmacist in addressing drug misuse</u> .	43%	54%	3%	0%	0%
d	discuss the <u>complexity of a drug taking problem</u> .	60%	34%	6%	0%	0%
e	discuss the <u>psychosocial aspects of drug abuse</u>	40%	57%	3%	0%	0%
f	describe the role of the pharmacist <u>in smoking cessation</u>	66%	31%	3%	0%	0%
Q5	Question 5 as posed in the student survey:	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
	Please rate whether you think that, overall , this assessment process is an appropriate means to determine students’ learning within this module	26%	51%	14%	9%	0%

4. Discussion

Studies related to how pharmacy students learn professionalism [1], team-based approaches to teaching ethics [4], How policy and professionalism in pharmacy education will likely impact on student learning [17], and whether pharmacy graduates possess the necessary professional skills [9] are included in the broad range of recently published research on the process of professionalization in

undergraduate pharmacy education. Discussion in the literature also includes the question of what characterizes professionalism in pharmacy students e.g., [26,28] and the relationship between knowledge and professionalism [27], thereby increasing the probability that educators already take a multifaceted approach to the design of undergraduate programs. Social contract theory [31,32] and the proposal that addiction pharmacy is an appropriate topic from which to make explicit the profession's (collective) societal responsibilities would appear to be consistent with various approaches to professionalization proposed. Inclusion of team-working and reflective practice competencies in published CCFs [12,13] reflects their importance to educators guiding student to prepare for practice as a pharmacist.

The aim of this study was to evaluate a novel assessment methodology intended to demonstrate and assess the attributes of reflective practice and teamwork in a manner that also demonstrates student recognition of the profession's responsibilities towards addiction to medicines. Evidence of student engagement and performance, survey responses and professional themes in wikis provide data with which to evaluate the initiative.

Review of Assessment Process Outcomes

Student "hits" online (228 hits/student during the workshop series), combined with attendance and completion rates greater than 98%, demonstrate very high levels of engagement and student performance as graded against the rubrics for reflective practice (average 58%) and teamwork (average 75%), range from lower second class honors to a "first" (greater than 70%) or distinction level. Higher average scores for teamwork (than for reflective practice) may be a result of student learning during a rubric guided online group decision-making assignment in another module during the previous semester. Voluntary student feedback, at a response rate of 66%, confirmed support for the continued use of the process. Eighty percent of students were in agreement with statements that the assessment process is an appropriate means of assessing engagement, reflective practice and teamwork and 94% or greater were in agreement that at the end of the assessment process students should be able to commit to the ethos of professionalism and to the various related learning outcomes (survey question 4(a-f) Box 1) aligned with the professionalization process.

However students also critiqued the workshop series in a constructive manner, indicating where it might be improved. (This reinforces the role that feedback from students plays in supporting reflective practice on teaching and learning for lecturers and module coordinators). Student recommendations included that (a) "it would be great if we heard from patients who are or previously have been treated on the methadone program"; (b) "Some more detail on how to actually carry out a brief intervention would have been useful" and (c) "simulation" of methadone dispensing or needle exchange would add to the program. Not only do these suggestions merit review, but engagement by students in such a constructive manner also supports a claim that the professionalization process (a program aim) has been effective. Survey feedback from students included comments indicating that they believed the exercise to have "really challenged my perceptions and thoughts on drug users" continuing that "In my professional career, I will most definitely have a greater understanding and knowledge of drug abuse and patient care", demonstrating not only that the experience of engaging with the workshop leaders,

or role models, had impacted as intended, but that they recognize how the interaction might lead to changed practice in the future.

Key themes, or societal challenges, such as legislative changes and supports required for benzodiazepine withdrawal programs, Methadone Maintenance Therapy (MMT) and Pharmacy Based Needle Exchange (PBNX) were evident in all 12 wikis but particularly highlighted in the 4 letters to the Minister for Health – demonstrating an awareness of the policy-maker’s power to support legislative change. The communications also reflected a deep understanding of the difficulties surrounding and potential benefits of e.g., needle exchange programs, as captured by one group when they wrote “needle exchange is a controversial issue. However, it is vital for harm reduction, with the potential to save and improve many lives”.

Additional themes introduced in the letters addressed to the Irish Times national newspaper included alcohol misuse, and the role pharmacists can play as community educators as captured in one inclusion “Pharmacists are in a position to offer support and provide education relating to drug abuse and addiction through direct patient interactions but also through connections with organizations such as Community Awareness of Drugs (a national community group that prioritises the “Prevention of Addiction through Information) offering educational programs” thereby displaying that students have internalized at least some aspect of professional altruism.

Wikis completed by groups addressing the general public audience of the “Late Late Show” television chat-show prioritised themes such as how structured medicines usage reviews could help manage benzodiazepine withdrawal programs and how parents might “recognise and combat signs of abuse both in yourself and those you care about”. Speaking directly to the “public” in a practical and balanced manner they highlighted that “A wide range of substances found in everyday life have the potential to be abused. Changes in sleep patterns, mood and concentration levels may be warning signs but before jumping to any conclusions it is important to consider that such behavior may just be part of growing up”.

These examples serve to spotlight some of the content available, on the VLE, to support the claim that this assessment process design makes a meaningful contribution to the drive to “effectively resolve” [2] (p. 155) the search for tangible measurable outcomes related to graduate attributes and other measures of the professionalization process.

The methodology therefore applies appropriate curriculum design and benefits of the VLE in a manner that stimulates engagement of learners with the experience of a series of workshops and aligns the demonstration of competencies with the social responsibilities of the profession itself.

As the VLE records the process by which individuals contribute and the team negotiates its way to consensus in order for subsequent assessment to occur, it provides a framework in which professional attributes such as teamwork can be assessed in a manner [21] not facilitated in the face-to-face environment. Multiple groups engaged in teamwork, or team-based learning, can be observed and facilitated simultaneously by one academic thereby accommodating demands of large cohorts. While rubrics can be effectively used in a paper-based face-to-face process, the VLE makes the rubric available to students as and when they engage online and to the assessor in a manner that provides increased transparency and efficiency when both grading and providing individualized feedback to students.

5. Conclusions

The study concludes that this innovative assessment process supports competency based assessment of the professionalization process and it is recommended that:

- Innovative adaptation of existing curriculum design, aligned with the use of technology to enhance the development and demonstration of professional attributes, merits structured review.
- The online learning environment supports the accessibility of rubrics, the recording of reflections and collaboration amongst students in order that professional attributes might be demonstrated and assessed.
- The professionalization process should address both the dynamic social contract between the public and the profession and the demonstration and assessment of graduate, or professional, attributes.
- Addiction Pharmacy is an appropriate module topic in which to situate consideration of pharmacy's social contract, or contribution to society.
- Reflective practice and teamwork are two professional, or graduate, attributes that merit assessment in the degree program.
- The potential for rubric supported online journal and wikigroup assignments to support the demonstration and assessment of the professional attributes "reflective practice" and "teamwork" merit further review.
- As patient-centered care of the addicted patient requires a multidisciplinary approach, adaptation of the strategy to accommodate multi-disciplinary undergraduate teaching, learning and assessment should be considered.
- Peer assessment as a group and of a group, merits further consideration, especially when it can be incorporated into an integrated assessment process as outlined in this paper.

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Author Contributions

Cicely Roche developed the material and process described, and she also wrote and approved the manuscript. Tamasine Grimes and Orla Hanratty provided feedback on early drafts of the manuscript.

Conflicts of Interest

The author declares no conflict of interest.

Appendix 1

Addiction Studies workshops: Reflective Practice rubric.

Ph4008: Version:[x]		Addiction Studies workshops Assessment Part 1: Rubric (Emphasis on reflective Practice).				Total: 15% Module
Student Name						
Criteria	Excellent I: 70%–100%	Very Good II.I: 60%–69%	Good II.2: 50%–59%	Fair III: 40%–49%	Weak F: Below 39%	
Reflective depth	Includes reference to workshop content; demonstrates analysis from a different perspective, demonstrates ability to think of alternative outcomes or approaches, and the potential to change practice based on reflective learning.	Includes reference to workshop content ; demonstrates analysis and evaluation from a different perspective(s), demonstrates ability to think of alternative outcomes or approaches	Includes reference to workshop content ; demonstrates analysis from a different perspective(s), demonstrates some ability to think of alternative outcomes or approaches	Includes reference to workshop content and some analysis behind the content; no evidence of using multiple perspectives in analysing the issues	Only includes reference to workshop content; no reflection is demonstrated beyond the descriptions	
Professional concepts and links with the role of the pharmacist in managing drug misuse.	Specific reference to key concepts in the workshop and/or prompt question, and clear linkage with the role pharmacists can play in managing drug misuse	Is accurate and well informed regarding concepts in the workshop and links with the role pharmacists can play in managing drug misuse.	Is generally accurate with respect to identification of concepts in the workshop with some omissions or errors and/or poor linkage with the role pharmacists can play in managing drug misuse.	Does not directly address the concepts in the workshop and/or fails to appropriately link with the role pharmacists can play in managing drug misuse.	Does not address the concepts in the workshop.	
Expression	125–150 words. Expresses ideas clearly, concisely, cogently and in logical fashion. Course content and literature are excellently cited and misspellings are rare.	100–175 words. Ideas are readily understood and reasonably organized. Course content and literature are appropriately cited and misspellings are rare.	100–200 words Ideas are readily understood but show signs of disorganisation Course content and literature are appropriately cited or misspellings are rare.	Over 200. Only an occasional idea surfaces clearly. Course content and literature are not appropriately cited. or misspellings are common.	Over 250. Writing is largely unintelligible. Course content and literature are not appropriately cited and misspellings are common.	
Feedback:						
Overall Grade:						
Acknowledgement		Trinity College Dublin (TCD) Guidelines on Awarding Grades for Essays and Examinations [43]. Dublin City University (DCU) Using marking schemes/rubrics—DCU [44].				
Prepared by:		Cicely Roche MPSI, School of Pharmacy, TCD: [date]				V[x]: PH4008

Appendix 2

Addiction Studies workshops: Teamwork rubric.

Ph4008: V [x]	Addiction Studies workshops Assessment Part 2: Rubric (Emphasis on Teamwork)					Total:15% Module
Student Name						
Criteria	Excellent I: 70%–100%	Very Good II.I: 60%–69%	Good II.2: 50%–59%	Fair III: 40%–49%	Weak F: Below 39%	
Engages with peers, negotiates towards an agreed document.	Engages well with the (wiki) contributions of others; furthers this by contributing examples of his/ her own opinion. Demonstrates influencing and negotiation skills to reason towards group consensus and to resolve conflict if it arises.	Engages well but with some omissions. Demonstrates influencing or negotiation skills to reason towards group consensus when others lead and to resolve conflict if it arises.	Generally engages with some missing opportunities to engage. Generally seeks to reason towards group consensus with occasional lapses and/or recognises conflict but does not actively help to resolve it.	Restates own opinions rather than engage with other's contributions. Restates own opinions rather than seek to resolve conflicts.	No evidence of engagement with other students' opinions. Appears to avoid conflict if it arises.	
Content: Use of sources.	Aim is clearly articulated and there is comprehensive and accurate coverage of the relevant professional concepts. Always references sources correctly.	Aim is clearly articulated and is accurate and well informed regarding relevant professional concepts. References are correct but not integrated with the argument.	Generally accurate with some omissions or errors. References are correct but rarely used.	Does not directly address the concepts for discussion. References are frequently incorrect.	Does not address the concepts. Does not reference sources.	

Ph4008: V [x]	Addiction Studies workshops Assessment Part 2: Rubric (Emphasis on Teamwork)					Total: 15% Module
Student Name						
Criteria	Excellent I: 70%–100%	Very Good II.I: 60%–69%	Good II.2: 50%–59%	Fair III: 40%–49%	Weak F: Below 39%	
Participation in the process in a respectful manner.	Netiquette evident at all times. Timely contributions and evidence of reflective “listening” on a consistent basis.	Netiquette evident most of the time. Timely contributions and evidence of reflective “listening” most of the time.	Netiquette evident, but some risk of breached. Participation is spotty; picks and chooses topics to get involved in; rare evidence of reflective “listening”.	Netiquette breached but later apologised. Student rarely participates freely, short contributions to the wiki that have limited relevance.	Netiquette guidelines breached. Student rarely participates freely; Has not made the requisite (3) number of contributions	
Expression.	Student uses grammatically correct sentences on a regular basis; expresses ideas clearly, concisely, cogently, in logical fashion. Has rare misspellings.	Sentences are grammatically correct; ideas are readily understood and reasonably organized. Has rare misspellings.	Sentences are generally grammatically correct; ideas are readily understood but show signs of disorganization. There are occasional misspellings.	Poor use of the language; only an occasional idea surfaces clearly. Misspellings present.	Writing is largely unintelligible. Misspellings present.	
Feedback:						
Overall Grade:						
Acknowledgement	Trinity College Dublin (TCD) Guidelines on Awarding Grades for Essays and Examinations [43]. Univ of Wisconsin-Stout. Online Professional Development. [45]					
Prepared by:	Cicely Roche MPSI, School of Pharmacy, Trinity College Dublin; [Date]					V[x]:PH4008

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